Constructing a Housing Precariousness Measure for Europe

Amy Clair[ab], Aaron Reeves[b], Martin McKee[c], David Stuckler[d]

[a]MiSoC, Institute for Social and Economic Research, University of Essex, Colchester

[b]Department of Sociology, University of Oxford, Oxford

[c]International Inequalities Institute, London School of Economics and Political Science, London

[d]European Observatory on Health Systems and Policies, London School of Hygiene and Tropical Medicine, London

[e]Bocconi University, Milan, Italy

Corresponding author:

Amy Clair
ESRC Research Centre on Micro-Social Change (MiSoC)
Institute for Social and Economic Research,
University of Essex
Colchester
CO4 3SQ
amy.clair@essex.ac.uk
01206 873657

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Abstract

There are concerns that the recovery from the Great Recession in Europe has left growing numbers of people facing precarious housing situations. Yet to our knowledge there is no comparative measure of housing precariousness, in contrast with an extensive body of work on labour market precariousness. Here we draw on a comparative survey of 31 European countries from the 2012 wave of European Union Survey of Income and Living Conditions to develop a novel Housing Precariousness Measure. We integrate four dimensions of housing precariousness: security, affordability, quality and access to services, into a scale ranging from 0 (not at all precarious) to 4 (most precarious). Over half of the European population report at least one element of housing precariousness; 14.7% report two dimensions and 2.8% three or more (equivalent to ~15 million people). Eastern European and small island nations have relatively greater precariousness scores. Worse precariousness tends to be more severe among the young, unemployed, single, and those with low educational attainment or who live in rented homes, and is associated with poor self-reported health. Future research is needed to strengthen surveillance of housing precariousness as well as to understand what policies and programmes can help alleviate it.

Introduction

The recent North Atlantic Recession had its roots in the housing market (Karanikolos et al., 2013; Wood et al., 2015). Following the recession in 2007, housing problems have increased across Europe, with 3.5 million people plunged into housing payment arrears between 2008 and 2010 (Clair et al., 2016). These developments are analogous to those in income and employment, where pay stagnated, unemployment rose and temporary contracts became more commonplace (Chung et al., 2012; Vives et al., 2013). These changes have stimulated academic interest in employment precariousness, with recent research finding that the fear, uncertainty and disruption produced by precarious work impacts negatively on a range of health and wellbeing outcomes (Barbier, 2011). As noted in a recent review this draws on several traditions in both the anglophone and francophone literature, conceptualising precariousness and applying it to areas that include income, employment, housing, and food supply (McKee et al., 2017). However, within this literature, there has been comparatively little exploration of the definitions and extent housing precariousness.

Several challenges have hampered our understanding of the extent of housing precariousness and its implications. One is that there is conceptual confusion about what is meant by precariousness and commonly associated notions of vulnerability, insecurity, and instability. Precariousness in housing is often treated as synonymous with homelessness or the risk of homelessness; however, homelessness remains a rather rare event and fails to capture the wider effects and consequences of precarious housing, such as overcrowding and poor conditions (Kennett & Iwata, 2003; Wellesley

Institute, 2010). Data on housing and housing conditions is also sparse, particularly cross-nationally and over time (Dewilde, 2015). As a result, existing measures of housing precariousness are largely confined to single-country studies typically using a limited number of indicators (Bentley et al., 2015; Pendall et al., 2012; Wood et al., 2015).

This dearth of research on housing precariousness is perhaps surprising in view of the extensive and growing body of work surrounding employment precariousness (Barbier, 2011). Barbier and colleagues conceptualise employment precariousness, or lack thereof, as the "stability and continuity of the employment relationship; stability of income; quality of working conditions; and access to social protection through the employment relationship" (Barbier, 2011 pg 7). Numerous studies show that this and alternative measures of employment precariousness correlate with a range of adverse outcomes, including short-term health consequences, such as psychosomatic symptoms, pain, high blood pressure, anxiety and depression (Clarke et al., 2007; Louie et al., 2006; Vives et al., 2013), as well as longer-term effects, such as slower career progression and delayed family formation (Korpi et al., 2003).

As well as having similarities to employment precariousness, there are several similar concepts already in use in housing research. Housing insecurity/instability is similar to housing precariousness, but it is a broader concept (Warren & Font, 2015); incorporating those facing homelessness, frequent moves, or unaffordability (Burgard et al., 2012). Before the recession housing insecurity research tended to focus on high-risk groups, such as people experiencing homelessness or those in receipt of social

security benefits (Burgard et al., 2012). Previous work operationalised housing insecurity as experiencing at least one of the following: overcrowding and frequent moves (Cutts et al., 2011); high housing costs, poor quality, unstable neighbourhoods, overcrowding or homelessness (Johnson & Meckstroth, 1998; Burgard et al., 2012). Similarly, work on housing deprivation has tended to focus on housing quality and experiences, typically including measures of problems such as damp, dark or overcrowding (Borg, 2015; Marsh et al., 2000). In contrast, housing precariousness, we argue, incorporates a wider range of housing issues in one measure, and results are scaled rather than binary (insecure/secure, for example), therefore more accurately capturing people's experiences of housing in the complexities of the modern housing markets.

The most novel explorations of dimensions of housing precariousness have focussed on only two countries (Web Appendix Box 1). Wood and colleagues assessed financial difficulties in the housing sectors of the UK and Australia (Wood et al., 2015); while Beer and colleagues, in the most comprehensive effort so far, measured aspects of housing tenure, affordability and forced moves in Australia (Beer et al., 2015). Here we seek to expand on this work by studying housing precariousness across a number of countries, using a measure of housing precariousness which includes a broader range of dimensions and components.

One crucial departure from this earlier work is the role of housing tenure. There has been a tendency thus far to include a measure of housing tenure in operationalisations of housing precariousness where renting is often considered inherently more

precarious than ownership. While in many nations, including the UK and Australia, evidence suggests that precariousness is indeed more likely among those that rent their homes, there is nothing inherently precarious about renting, as some countries demonstrate. In Germany for example, tenants often have indefinite leases, providing far more security than is typical in the UK, for example, where 6-12 month tenancies are standard. Ignoring these differences by treating renting as innately more precarious than ownership risks obscuring opportunities for policy learning through comparative study.

In this paper, we take a comparative approach to the measurement of housing precariousness, and provide a 'first step' in the definition and operationalisation of housing precariousness. As suggested above, one of the benefits of this approach is the ability to identify countries where precariousness levels are lower, particularly among renters, as a first step in identifying potential cases for lesson drawing. Here, we use the 2012 wave of the EU Statistics on Income and Living Conditions (EU-SILC), which included a special ad-hoc module to capture detailed information about the state of the housing sector in Europe – including housing quality and experience of forced moves – along with demographic and housing information captured in the standard survey. Here, to our knowledge for the first time, we use this survey to develop a Housing Precariousness Measure that can compare degrees of precariousness across 31 European countries.

Defining Housing Precariousness

Precariousness has been invoked in multiple ways in the housing and employment literatures, for example:

> "the spread of greater labour market flexibility, greater job insecurity, a greater fragility in relationships and a weakening in the formal provision of social welfare" (Nettleton & Burrows, 2001)

> "the concepts of precarious housing and precarious employment make direct reference to the marginal position of many households" (Beer et al., 2015)

> "employment… [that] is uncertain, unpredictable, and risky from the point of view of the worker" (Kalleberg, 2009)

> "insecure, contingent, flexible work -- from illegalised, casualised and temporary employment, to homeworking, piecework and freelancing" (Gill & Pratt, 2008).

These definitions emphasise the increased exposure to uncertainty through the privatisation of risk, which shifts the costs and risks from employers, for example, onto individuals. The ILO (2011) argues that "precarious work is a means for employers to shift risks and responsibilities on to workers". Analogous changes in housing have seen mortgage providers protect themselves from risk by demanding higher deposits for purchases, forcing people to expend more and live in other sectors for longer. These definitions also emphasise the contingency of precariousness; it affects individuals but is not intrinsic to them.

Drawing on these definitions, we conceptualise precariousness as a state in which (perceived) exposure to an adverse event is increased. Precariousness is, to some extent, perceived because an individual's view of their circumstances may differ from reality, but is nonetheless important and likely to affect the statistical association between states of precariousness and health and well-being, for example (Vives et al., 2013). Building on the work of Beck (1992), this conceptualisation of precariousness illuminates the distribution of risk in a society, and extends previous approaches to measuring housing difficulties by simultaneously considering a broad range of housing issues.

We operationalise housing precariousness as consisting of four components: affordability, security, quality and facilities, and access to essential services. A person may be experiencing none or all of these issues; but we argue that they are often interconnected. Poor access to essential services may affect their ability to maintain employment, perhaps due to health service or transport issues, increasing their risk of job loss. In turn, the housing precariousness issues they face may increase the impact of this adverse event, due to high housing costs that are concurrent with continued inadequate access to services.

Precariousness, of course, is not deterministic; individual, community, or social resilience will mediate how increased precariousness impacts well-being. Precariousness is therefore a counterpart to the concept of resilience, which can also only be understood in relation to exposure to an adverse event or shock. Luthar et al (2000) define resilience as the dynamic ability of individuals, communities and entire

societies to adapt positively to shocks. However, unlike resilience, which is a process activated when a person or community experiences a shock or adverse event (Richardson, 2002), precariousness refers to the level of exposure to and the consequences of adverse events. In other words, precariousness is a social position in which people are at recognisably greater risk of experiencing a shock and in which the consequences of that shock are also greater. The ultimate consequences of those shocks depend, in part, on those persons' and their communities' degree of resilience to them. In short, their resilience will mediate how an adverse event affects their health and well-being.

The impact of precariousness depends on the potential risks or shocks in broader society, such as the presence and extent of a recession, as well as the social protection available. Vives et al., (2013) suggest that "a strong welfare state protects workers" from the consequences of employment precariousness. Such protections will likely also be important in relation to housing precariousness. We refer to this as the level of risk and protection in a country as *precarity*, and, while important, we do not include precarity in this paper.

It is important to distinguish precariousness from vulnerability, which we relate to the characteristics of groups rather than their actual experiences and/or situations. Thus, vulnerable groups, such as substance users may be more likely to suffer from a precarious housing environment, just as precarious employment has been found to be clustered among certain groups (Beer et al., 2015; Pendall et al., 2012; Vives et al., 2013). Similarly, risk factors and individual characteristics may increase that

individual's risk of an adverse outcome. Gender is one example. Women have been found to be at greater risk of living in substandard homes than men in Britain for example, making gender a risk factor (Pevalin, 2015). As such gender is one individual characteristic which may increase a person's likelihood of living in precarious housing, but not an identifier of precarious housing.

Based on these interpretations of the nature of risk factors, vulnerability and precariousness, we define housing precariousness as:

> "A state of uncertainty which increases a person's real or perceived likelihood of experiencing an adverse event, caused (at least in part) by their relationship with their housing provider, the physical qualities, affordability, security of their home, and access to essential services"

Having defined housing precariousness, this paper has the following aims:

1. To create a comparative measure of housing precariousness for Europe using secondary data.
2. To explore the differing levels and types of housing precariousness across countries in Europe.
3. To compare housing precariousness across housing tenures.
4. To investigate the relationship between housing precariousness and individual characteristics.

Measuring Housing Precariousness

Based on categories used in the existing literature on precariousness, as well as our definition of housing precariousness, we operationalise housing precariousness by populating four categories, as described below:

1: Housing **affordability** is perhaps the most obvious mechanism through which housing can be considered precarious. Housing costs have obvious implications for housing precariousness, including increased risk of eviction and foreclosure where people struggle to pay (Nettleton & Burrows, 2001). Less directly, where housing costs consume a high proportion of household income, people are less able to develop strategies such as accumulating savings to protect themselves from shocks, or to conduct maintenance that will ensure the structural sustainability of their home. Unaffordable housing and housing payment problems are also associated with a range of health problems, particularly relating to mental health (Taylor et al., 2007).

2: **Security** in housing relates to the stability of a person's housing situation, and whether they have control over if and when they leave their home. Alongside concerns regarding increases in 'zero-hours' and temporary contract employment across Europe, there have also been concerns about increasing reliance on short-term rental contracts, as well as increased eviction and foreclosure rates. Sometimes such changes can be an explicit goal of government policy, as with the removal of tenancies for life in social housing in England. Owners are not immune from forced moves, a notable recent example being the removal of owners from so-called 'sink estates' currently being planned in England (Gov.uk, 2016). Lack of housing security is a considerable stressor,

especially where there is little control or autonomy over when such a move may take place and how much notice is given.

3: There is considerable literature on the impact of housing **quality and facilities** on people's health and well-being. Issues such as damp, poor ventilation, toxicity in the home can have serious impacts on health (Gibson et al., 2011; Shaw, 2004; Smith, 1990). These health impacts increase people's exposure to external shocks, including interventions that have consequences for housing. For example, where rented housing quality is particularly bad, or deemed to be overcrowded, local government may step into improve the situation, likely leading to removal of (some of the) tenants from the property. The inclusion of essential facilities in the measure, such as a toilet solely for the household, further indicates the suitability and sustainability of the home.

4: Finally, we include an **access to essential services** dimension. Lack of convenient access to essential services means the home is unsustainable and people's ability to enjoy their life and exercise their rights – to health care if they are unwell for example – is impaired. This dimension provides an overview of the constraints placed by people's housing situation on their ability to exercise their rights and partake in society.

Data

To facilitate comparability over time and for coherence with existing surveillance systems in Europe we propose components of housing precariousness using publicly available secondary data. Specifically, we draw on the 2012 wave of the EU-SILC cross-

sectional survey. While more recent EU-SILC data are available, this particular wave includes an *ad hoc* module on housing conditions, including questions about reasons for recent moves. An additional advantage of this approach is that the questions used are frequently available in national surveys, meaning that the measure may be derived from these surveys. Details of the EU-SILC have been described elsewhere (Arora et al., 2015; Dewilde, 2015; Iacovou et al., 2012) but briefly, the EU-SILC provides a representative survey of 31 countries: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxemburg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, and the United Kingdom. Each country collected its own data, with Eurostat specifying minimum sample sizes and guiding sampling design to ensure adequate sizes and population representativeness, as well as providing standardised questionnaires.

Construction of Housing Precariousness Measure

We populated each of the four dimensions of housing precariousness as follows (see also Web Appendix Table 1):

Affordability: this is measured based on responses to questions on whether housing costs are a financial burden. Housing costs include not only rent and mortgage payments, but all essential costs such as service charges and maintenance. Those that report their housing costs are a heavy burden are coded separately to those reporting

costs as a slight burden or no burden at all, indicating an acute lack of affordability and increased precariousness.

Security: based on forced moves. If a person has had to move in the past five years due to housing reasons (such as eviction/foreclosure or landlord not renewing tenancy), or report that they are being forced to move for housing reasons in the next year, they are coded as having experienced a forced move. We excluded moves due to other reasons, such as for employment or education.

Quality and facilities: includes six questions relating to the quality and presence of essential facilities in the home. The ability to keep the home adequately cool in the summer and warm in the winter, bath/shower, toilet (for the sole use of the household and indoors), leaks/damp and overcrowding. Each variable is given a binary coding reflecting whether the facility/quality is present in the home, resulting in a variable ranging from 0 to 6. Those that have 2 or more issues are coded as not living in a home of adequate quality or with adequate facilities.

Access to essential services: includes the ability to access five essential services: banking, postal, transport, grocery and health care services. The data collection for these variables emphasises objective accessibility in regard to physical and technical access, not price or quality for example (Eurostat, 2010). Each variable is binary coded to indicate whether each service is reasonably accessible to the home. The resulting 0-5 scale is recoded so that those that have difficulty accessing 3 or more services are coded as having poor access to services.

The two dimensions constructed from multiple items, 'quality and facilities' and 'access to essential services', have adequate Cronbach's alphas by conventional measures of 0.50 and 0.83, respectively, indicating internal consistency. The lower alpha for quality and facilities likely reflects the aforementioned lack of a cumulative relationship with such issues. We gave each dimension equal weight in the final measure, although alternative approaches are explored later in the article. This created a scale ranging from 0 to 4, with a higher score representing a more precarious housing situation.

Table 1 gives the descriptive statistics for all variables used in this analysis. We limited our sample to respondents who answered all necessary questions for the precariousness measure. We used the personal cross-sectional weight in the dataset; weighted sample sizes for each country varied, ranging from 243 in Iceland to 72,779 in Germany. The total weighted sample size is 428,415 (428,863 unweighted).

[Table 1 about here]

We now turn to the results of an investigation of our measure, its relationship with tenure, individual characteristics, and country-level patterns.

Results

Magnitude of housing precariousness in Europe

We find that 47.4% of the European population are in the least precarious category (zero). About one-third, 35.1%, report a score of 1. 14.7% report 2 and about 2.8% report 3 or more, indicating that their housing situation is highly precarious. Thus,

based on this measure, approximately 273 million people in Europe experience some sort of housing precariousness. Next, we investigated which dimensions of precariousness were the most common and evaluated their interrelationships. As shown in Web Appendix Table 1 subjective affordability (i.e. high financial burden) is the most common source of precariousness, affecting over 35% of respondents, somewhat higher than would be expected using an objective measure (housing costs as a proportion of income) of housing affordability (Eurostat, 2017). The most co-prevalent dimension with affordability was inadequate quality and facilities, with 9.49% of the sample reporting living in home that was both expensive and had at least 2 issues with facilities or physical condition. The least common factor was facing or having experienced a forced move.

Comparing housing precariousness across countries

We next compared the types and degrees of housing precariousness across European nations. Figure 1 shows the distribution of scores across countries. Norway, Sweden, Netherlands and Denmark have the lowest mean precariousness scores (all less than 0.45 on average), reflected in the large proportions of the population reporting zero elements of precariousness. In contrast, the worst performing countries are Eastern European nations and small island states, including Bulgaria, Cyprus, Romania, and Poland. These observations are corroborated by evidence that Norway and Sweden tend to have high quality and stable housing, although they have achieved this in different ways with Sweden pursuing a tenure neutral housing policy and Norway promoting home ownership through government mortgages (Dewilde & De Decker, 2016).

[Figure 1 about here]

We further investigate differences in housing precariousness across nations by producing radar charts which show the prevalence of each dimension. We report results for all countries, Austria, Bulgaria and Sweden (Figure 2), countries chosen because of their different results, as well as because they represent different approaches to housing policy based on Kemeny's work on housing theory, with Sweden and Austria representing 'unitary' markets, where state and private housing provision compete, and Bulgaria a 'dualist' system where state housing is reserved for particular groups and does not compete with private provision (for example Kemeny, 1995, 2006, 2014). Austrian respondents report low levels on all dimensions of precariousness. By contrast Bulgaria reports high levels of issues with affordability and quality. Alternatively, Sweden reports low levels of affordability, access and quality issues, but relatively higher levels of insecurity.

[Figure 2 about here]

Housing precariousness, individual characteristics and tenure

In this section we examine how the housing precariousness measure relates to individual characteristics, and also test the validity of the housing precariousness measure by assessing whether it exhibits anticipated linkages with these socio-demographic characteristics (Beer et al., 2015; Benach et al., 2014; Vives et al., 2013). It is clear from descriptive statistics that precariousness is higher among single people, the unemployed, unhealthy and with lower education levels (Figure 3). Precariousness

is also negatively associated with age (Spearman's r = -0.09, $p < 0.01$), as well as income (Spearman's r = -0.21, $p < 0.01$), as would be expected. Finally, we evaluated housing tenure, anticipating that renters would fare worse. Indeed, those who rent their homes, either at market rate (mean precariousness score 0.78), reduced rate (0.85) or for free (for example, as a job-related benefit in kind) (0.92), report substantially higher precariousness than do owners (mean 0.73 for outright owners and 0.63 for owners with a mortgage).

[Figure 3 about here]

Figure 4 investigates tenure differences in precariousness across countries. This shows that in all 31 countries renters are found to have higher average levels of housing precariousness than owners, even in countries such as Germany which are considered more tenure neutral. However, there is some variation in the gaps between owners and renters; for example, renters are less disadvantaged relative to owners in countries such as Germany and Estonia (also Bulgaria, but the precariousness level for both groups is very high). Germany appears to have found a means to have low precariousness overall, similar to that in Norway and Sweden for example, but to have avoided the more extreme inequality across tenures found in these nations. However, it should be noted that the variation in differences by tenure may reflect the previously mentioned differences in the nature of renting across countries.

[Figure 4 about here]

We next show a radar chart which shows how the dimensions of precariousness vary across tenure in all countries, as well as reporting case studies of tenure differences in 3 nations (chosen for the same reason as those in the previous radar charts). The radar charts in Figure 5 gives some interesting insights. Overall, both owners and renters report high levels of problems with affordability, while renters are more likely to report quality and security issues. Access to essential services is a greater problem among home owners. Looking at a selection of individual countries demonstrates how the experience of precariousness by tenure varies across nations. Results for Austria indicate that renters are somewhat more likely than owners to experience affordability, security and quality problems, but less likely than owners to face issues when accessing essential services. In Iceland, the chart shows that renters experience more insecurity but are somewhat more likely to find their housing affordable. In the UK, a country characterised by dualist housing policy, the radar shape for renters and owners is very similar, but with more renters reporting precariousness across all of the dimensions.

[Figure 5 about here]

Sensitivity tests

We performed a series of sensitivity tests to investigate the impact of the coding and construction choices in the housing precariousness measure.

First, there is evidence that excess winter deaths are more of a problem in temperate countries than cold countries (Healy, 2003; McKee, 1989), suggesting that the relationship between health and climate is not direct. However, the poorest performers

in our measure are predominantly hot southern countries, potentially indicating that the inclusion of thermal comfort variables may be unduly penalising them. Thus, we reproduced the measure excluding the thermal comfort variables. The results were very similar in regard to country rankings (Spearman's r= 0.98, $p < .001$) and individual characteristics (Web Appendix Figure 1), suggesting consistency across the two approaches. Even when we compare these two approaches on the facilities and quality dimension alone the correlation is .80 ($p < .001$). These results suggest that the inclusion of the thermal comfort variables is not unduly affecting the cross-country results (Web Appendix Figure 2).

As another alternative approach, we consider financial burden as an essential component of housing precariousness. In this approach, high financial burden is a prerequisite for being considered as living in precarious housing, the presence of other issues indicates more extreme precariousness. This approach results in a measure with 65.16% of respondents reporting 0 issues (no housing cost burden), 24.24% reporting 1 (housing cost burden), 9.31% reporting 2, 1.29% reporting 3 or more. We again replicate Figure 5 (Web Appendix Figure 3) with the new precariousness measure and find similar relationships to those found originally. One slight exception is the decreased health among those that score 1 on the precariousness measure, likely reflecting the poor health among those facing heavy financial burden. The advantages and disadvantages of this approach are less clear and choices may reflect individual preferences regarding the nature of housing precariousness. Although this approach limits precariousness to a single indicator in that financial burden is required, it still

arguably encompasses a more holistic approach than reliance on a single indicator alone and allows for differentiation of the extent of precariousness experienced. We argue that the original measure is more appropriate as it does not relegate non-financial but nonetheless important issues in the way that the burden approach does. Whether a home is suitable, stable and accessible are all important issues that affect the experience of the resident and as such we feel that they should be given equal weight in a measure of housing precariousness.

As our final alternative, we change the manner in which we treat the access to services and quality/facilities dimensions of the measure. Rather than treating the dimensions as binary, based on a threshold, we treat them as a cumulative measure based on the proportion of issues, ranging from 0-1, where 1 indicates that a person is lacking in all quality/facilities or access to services, 0 indicates no such issues. Should a person report lacking one of the five access components they would score 0.2, should they lack two they would score 0.4 and so on. Quality/facilities were treated in this same way. As such a person's precariousness score can range from 0-4 as previously, but is not limited to integers. The results of this approach are shown in Web Appendix Figure 4. Once again this alternative construction results in very limited changes to the findings, indicating that the threshold approach does not bias the findings.

Discussion

In this paper, we have sought to define and operationalise housing precariousness in Europe. The housing precariousness measure that we propose indicates that

precarious housing affects over half of the population of Europe in some way (equating to almost 260 million people). Financial burden is the most common problem experienced, often coexisting with quality issues; nearly 10% of the European population (or ~52 million people) are struggling to afford to live in homes of inadequate quality. There are considerable differences in levels of precariousness across countries. Relatively low levels of housing precariousness are found in Northern European countries such as Norway, Sweden and Denmark, while considerably higher levels are found in Southern European countries. Bulgaria is found to perform worst by this measure, with nearly three-quarters of the population reporting at least one dimension of housing precariousness.

As with any analysis however there are a number of limitations to this work. First, the EU-SILC may fail to capture some of the most vulnerable and precarious groups, such as those who move very frequently, due to its household sampling approach. This would tend to understate the magnitude of precariousness in Europe. Similarly, the reliance on secondary data means that our approach is limited by the variables included in the survey and decisions made during data collection (Dewilde, 2015). This is notable, for example, in the inability to include broader measures of housing and location suitability in the access to services component. Similarly, we rely on a subjective measure of housing affordability because of low response rates to questions on housing costs and income. This approach does have the advantage of including all housing costs (including energy costs for example), but may be subject to variation across respondents and countries.

Secondly, as highlighted by Vives et al. (2013), people can find themselves in objectively precarious positions but not perceive them as such, and this subjective perception is important for the effects their situation has on their lives. There are, however, to our knowledge no such comparative subjective indicators available with the exception of the housing burden variable. Thirdly, our measure does not aim to capture all elements of housing difficulty. For example, Sweden performs relatively well in the country comparison, yet it is known that in many areas waiting lists for rented accommodation are very long (Crouch, 2015; Emanuelsson, 2015; The Local, 2015). However, in this as in many complex systems, such as provision of health care, a single measure cannot include all such issues, and so country specific problems may be missed in cross-country comparisons. Fourthly, our measure of security fails to capture the length of tenancies for renters or other measures of the frequency of past moves.

Despite these limitations the Housing Precariousness Measure represents a step forward, allowing, for the first time, cross-European investigation into the extent of housing precariousness and who experiences it. Our findings also indicate that precarious housing is clustered among more disadvantaged groups, such as those with lower levels of education and those with limiting health conditions. At this stage, our analysis only considers bivariate relationships; future research should investigate overlaps and interactions among these characteristics.

Across countries we found that precariousness was consistently higher among renters than owners, although the existence of housing precariousness among owners shows that ownership is not a panacea for precariousness. The cross-country variation in

tenure differences shown in Figure 4 demonstrates that precariousness among renters in some countries is lower than precariousness among owners in others. There is also quite considerable variation in terms of the gap between owners and renters. These findings indicate that there is scope to improve the security of renting and reduce tenure-related inequality. Future research should explore these findings in relation to the comparative welfare state literature.

There are a number of further possible future directions to this work. One is a comparison between the results presented here and those for 2007 when the EU-SILC first conducted the ad-hoc housing conditions module. This would give insight into the changes in levels of precariousness before and after the recession and austerity periods. However, this would be subject to the same limitations as this analysis due to the reliance on secondary data. Improvements in the quality and quantity of data collected on housing are one way to reduce such problems. Alongside or independent of this possibility is to develop a bespoke questionnaire. Finally, further exploration of the radar charts in Figures 2 and 5 may provide insight into the differences in housing regimes across countries, and the relative position of renters and owners across Europe.

For policy, our results demonstrate, firstly, the massive scale of precariousness in Europe. Over 15 million people experience a high degree of housing precariousness reporting 3 or more elements in the scale. Second, it is clear that renters fare worse than do owners, although the extent varies considerably across nations. There are marked international variations to be explained, which cannot solely be accounted for

by GDP. This creates an important opportunity to learn from success or failure in how European nations have sought to secure stable housing.

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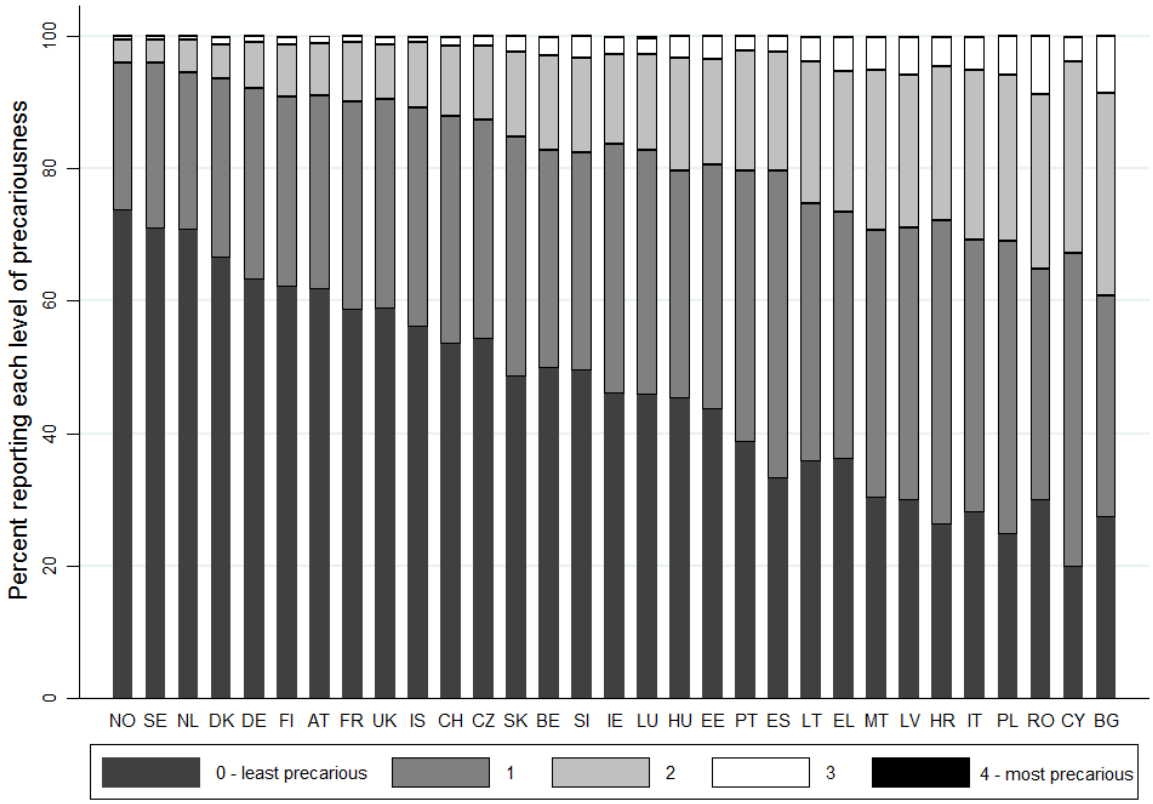
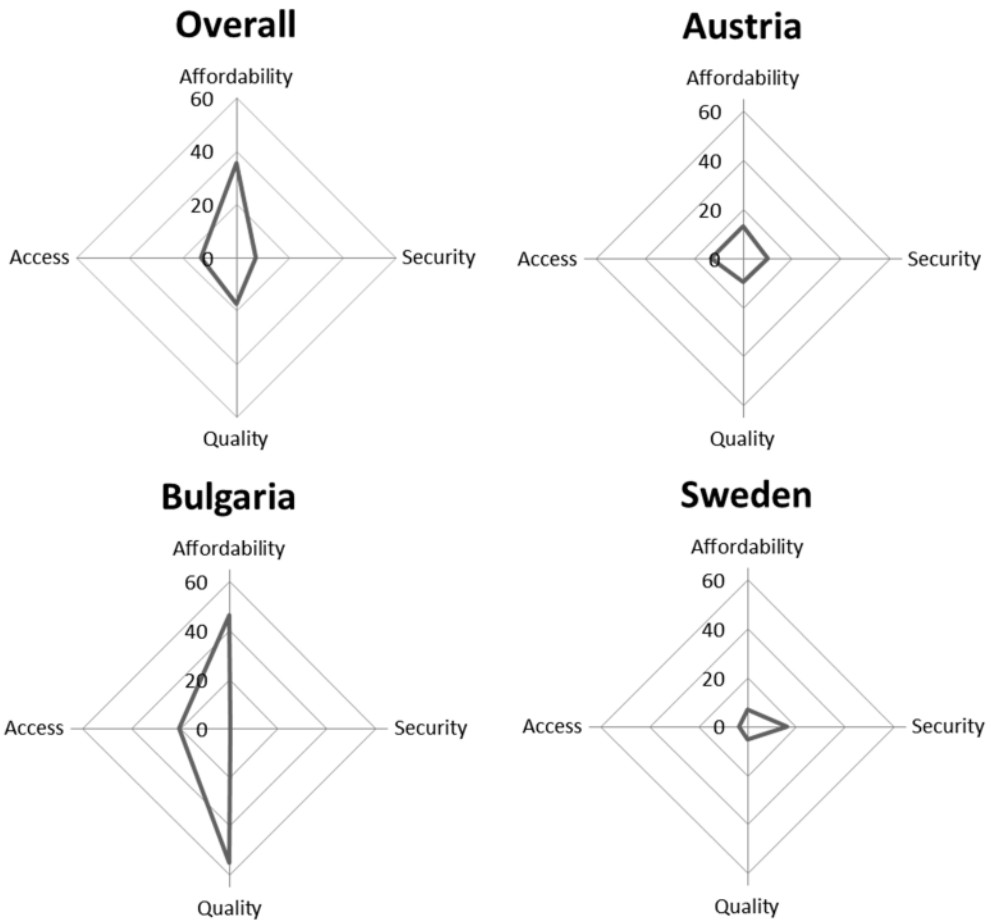
Figures, Tables and Boxes

Figure 1. Distribution of Precariousness Scores across countries



Note: Because of the small number of people experiencing all 4 elements of housing precariousness, this category is very small on the chart.

Figure 2. Radar charts showing the prevalence of housing precariousness dimensions in three countries and overall



Note: Scale refers to percentage of respondents

Figure 3. Mean Housing Precariousness Scores according to individual characteristics

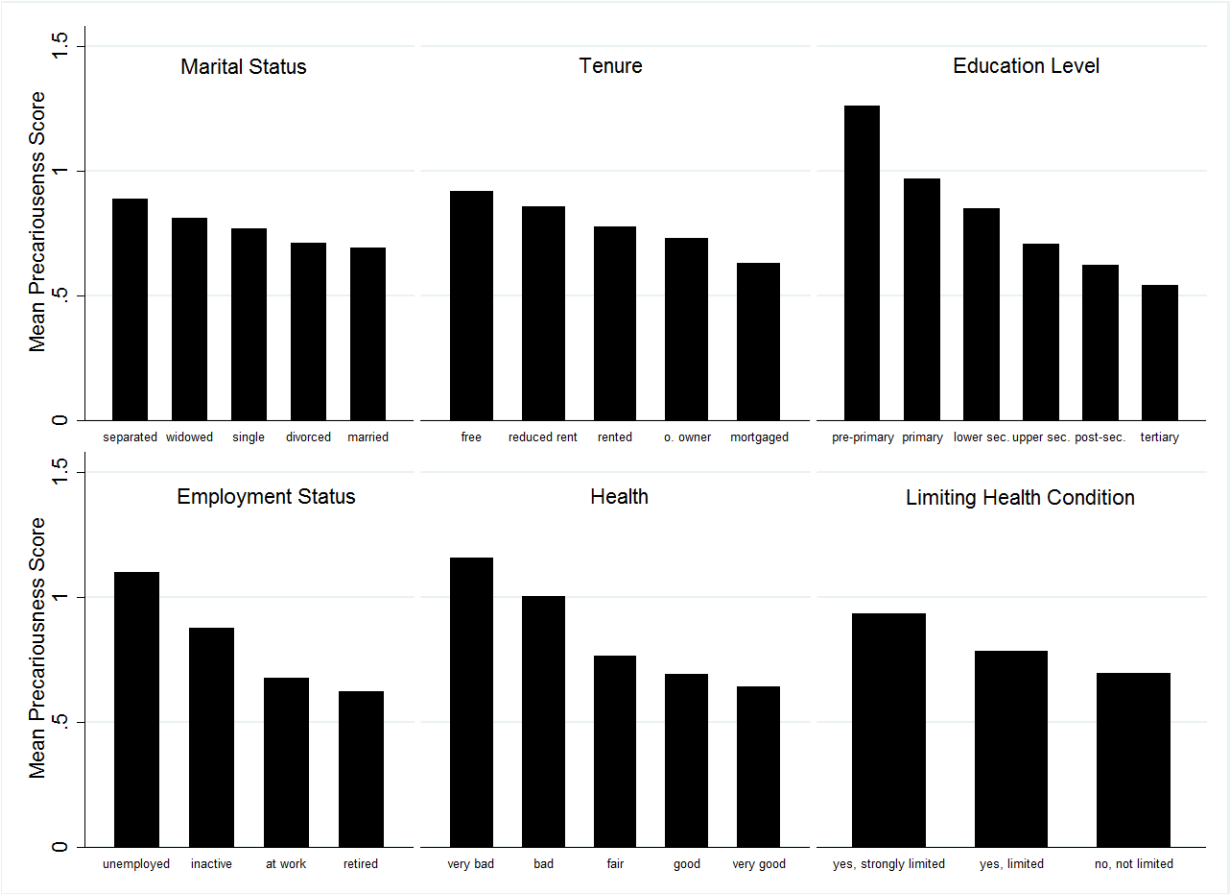
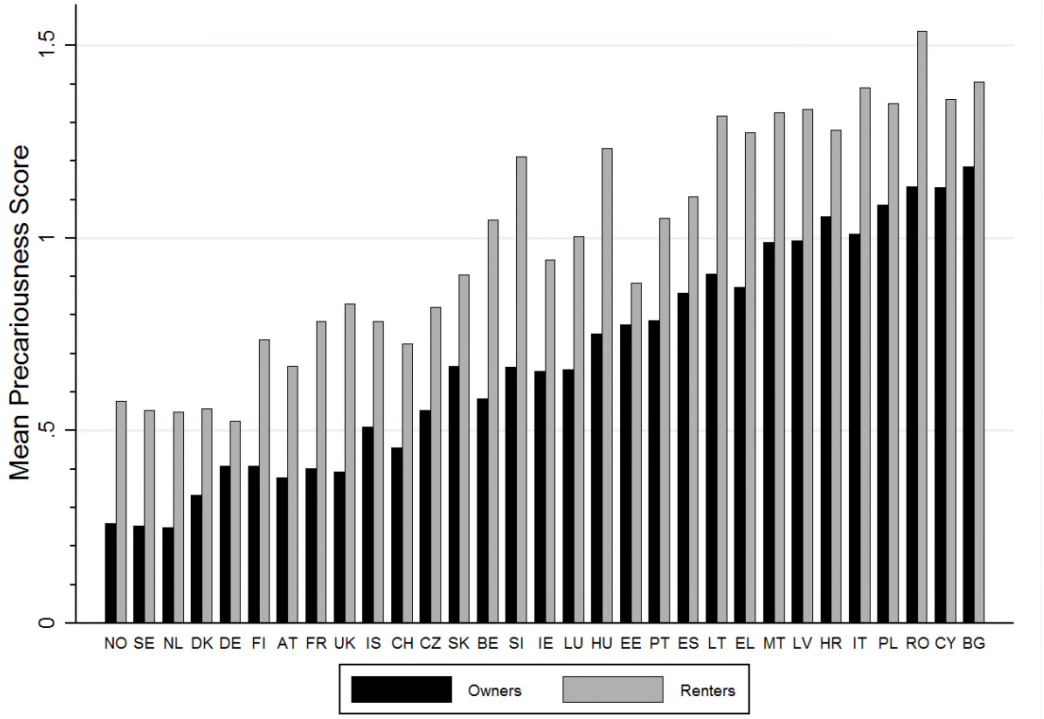


Figure 4. Mean Precariousness Score by tenure across Europe



Note: Owners includes both those that own outright and those that have a mortgage. Renters includes both market rate and reduced rate tenants. Given their relative rarity, as well as their unusual situation, those living rent free are excluded here.

Figure 5. Radar plots showing the prevalence of dimensions of housing precariousness in 3 countries and overall, by tenure

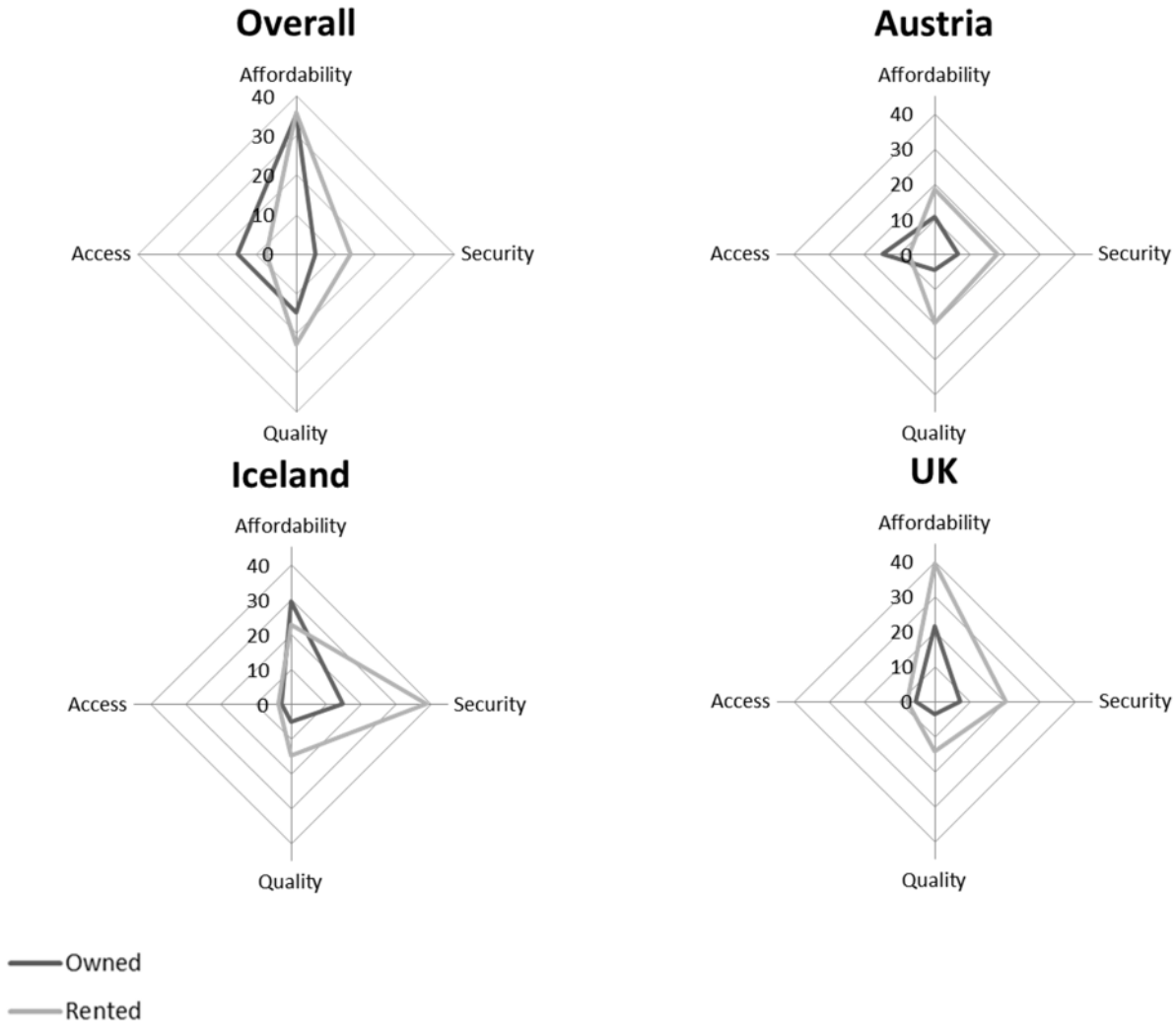


Table 1. *Weighted descriptives*

	Variable	Categories	Frequency (valid %)
Individual Characteristics	Gender	Male	206,657 (48.2%)
		Female	221,757 (51.8%)
	Marital status	Never married	131,437 (30.7%)
		Married	228,965 (5.47%)
		Separated	5,667 (1.32%)
		Widowed	35,442 (8.28%)
		Divorced	26,739 (6.24%)
	Tenure	Outright owner	203,836 (47.6%)
		Owner with mortgage	104,425 (24.4%)
		Tenant	76,840 (17.9%)
		Reduced rate tenant	25,672 (5.99%)
		Free accommodation	17,534 (4.09%)
	Education level	Pre-primary	3,229 (0.77%)
		Primary	46,347 (11.1%)
		Lower secondary	79,747 (19.1%)
		Upper secondary	179,199 (42.8%)
		Post-secondary	13,730 (3.28%)
		Tertiary	96,605 (23.0%)
	Employment status	Employed	219,118 (51.2%)
		Unemployed	29,785 (6.96%)
		Retired	99,711 (23.3%)
		Other inactive	79,166 (18.5%)
	General health	Very good	96,579 (23.4%)
		Good	186,051 (45.1%)
		Fair	89,698 (21.7%)
		Bad	31,959 (7.75%)
		Very bad	8,295 (2.01%)
	Limiting health condition	Yes, strongly limiting	34,987 (8.31%)
		Yes, limiting	73,694 (17.5%)
		No	312,314 (74.2%)

	Age[1]	Mean 47.6, S.D. 18.2	
	Disposable income	Mean 32536, S.D. 31373	
Housing Precariousness Components	Immediate risk of changing the dwelling	Yes – forced move	3,437 (0.80%)
		Yes – voluntary move	19,073 (4.45%)
		No	405,794 (94.74%)
	At least one change of the dwelling during the last five years	Yes	73,322 (17.12%)
		No	355,067 (82.88%)
	Reason for change of dwelling	Housing related	26,329 (6.17%)
		Other	400,729 (93.83%)
	Access to grocery services	Some difficulty[2]	47,750 (11.15%)
		No difficulty[3]	380,665 (88.85%)
	Access to banking services	Some difficulty	76,181 (18.03%)
		No difficulty	346,239 (81.97%)
	Access to postal services	Some difficulty	81,471 (19.93%)
		No difficulty	327,405 (80.07%)
	Access to public transport	Some difficulty	73,753 (20.69%)
		No difficulty	282,769 (79.31%)
	Access to health services	Some difficulty	76,610 (17.88%)
		No difficulty	351,802 (82.12%)
	Leaks/damp/rot	Yes	61,821 (14.43%)
		No	366,594 (85.57%)
	Shortage of space/ overcrowding	Yes	55,955 (13.06%)
		No	372,460 (86.94%)
	Own bath or shower	No	14,740 (3.44%)
		Yes	413,675 (96.56%)
	Own toilet	No	16,248 (3.79%)
		Yes	412,167 (96.21%)
	Dwelling comfortably	No	54,064 (12.62%)

[1] Aged 80 or over grouped together
[2] Includes 'with great difficulty' and 'with some difficulty' responses.
[3] Includes 'easily' and 'very easily' responses

	warm	Yes	374,351 (87.38%)
	Dwelling comfortably cool	No	82,371 (19.23%)
		Yes	346,044 (80.77%)
	Financial burden	Heavy burden	153,305 (35.78%)
		Somewhat/no burden	275,110 (64.22%)

Web Appendix

Web Appendix Figure 1. Mean Housing Precariousness Scores according to relevant characteristics (alternative precariousness measure 1)

Web Appendix Figure 2. Mean Precariousness Scores across countries (alternative precariousness measure 1)

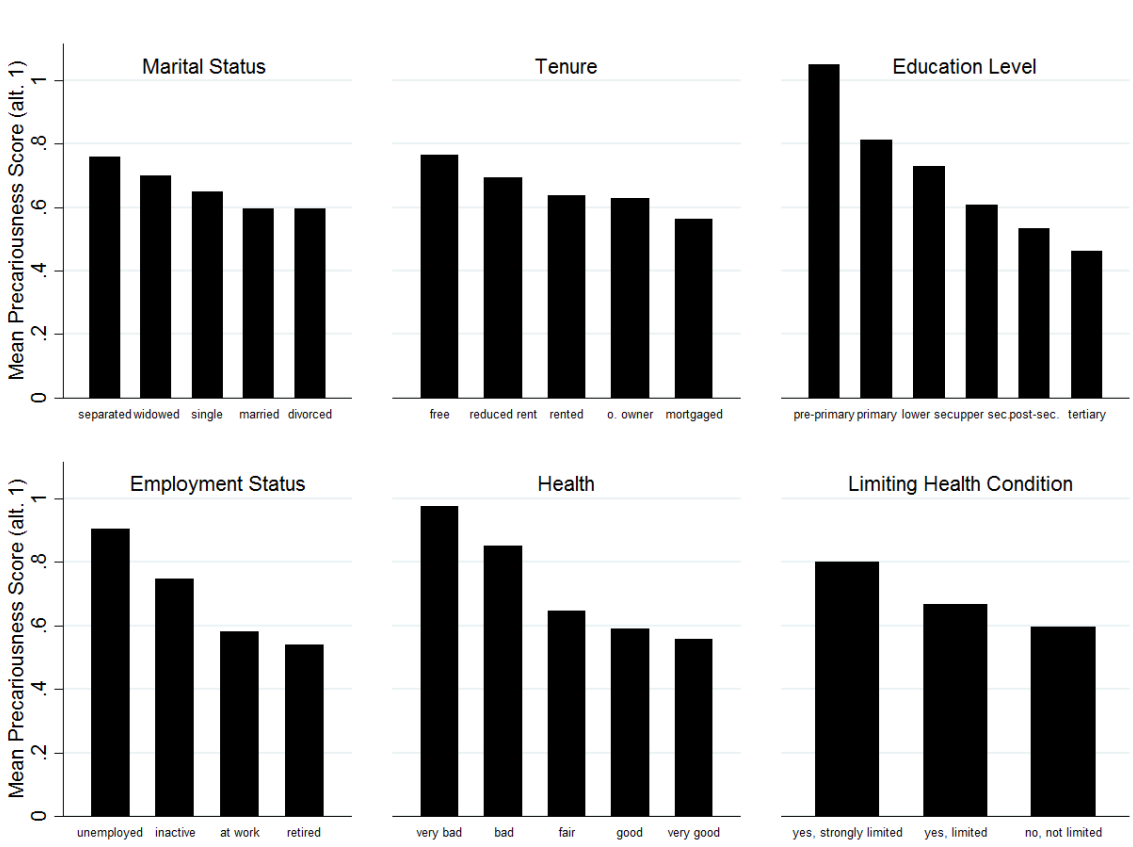
Web Appendix Figure 3. Mean Housing Precariousness Scores according to relevant characteristics (alternative precariousness measure 2)

Web Appendix Figure 4. Mean Housing Precariousness Scores according to relevant characteristics (alternative precariousness measure 3)

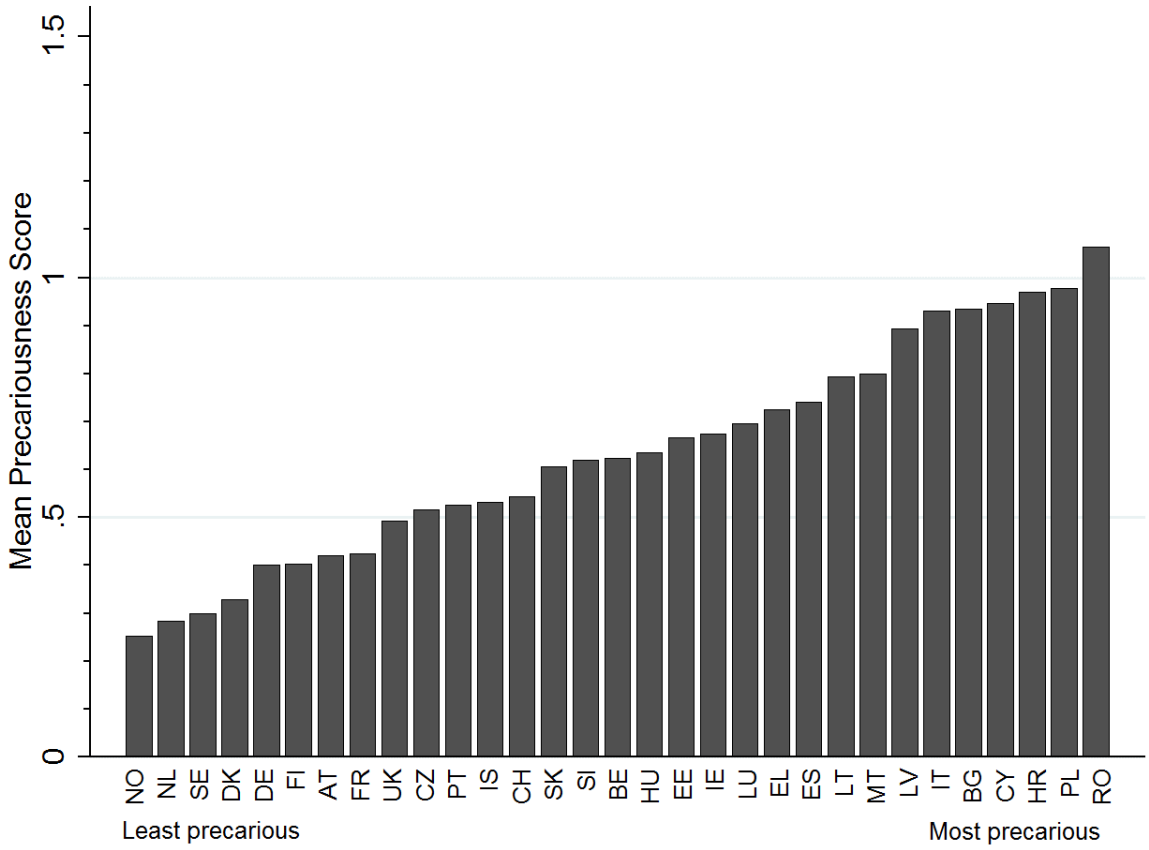
Web Appendix Table 1. Housing Precariousness Measure construction

Box 1: Examples of existing approaches to housing precariousness

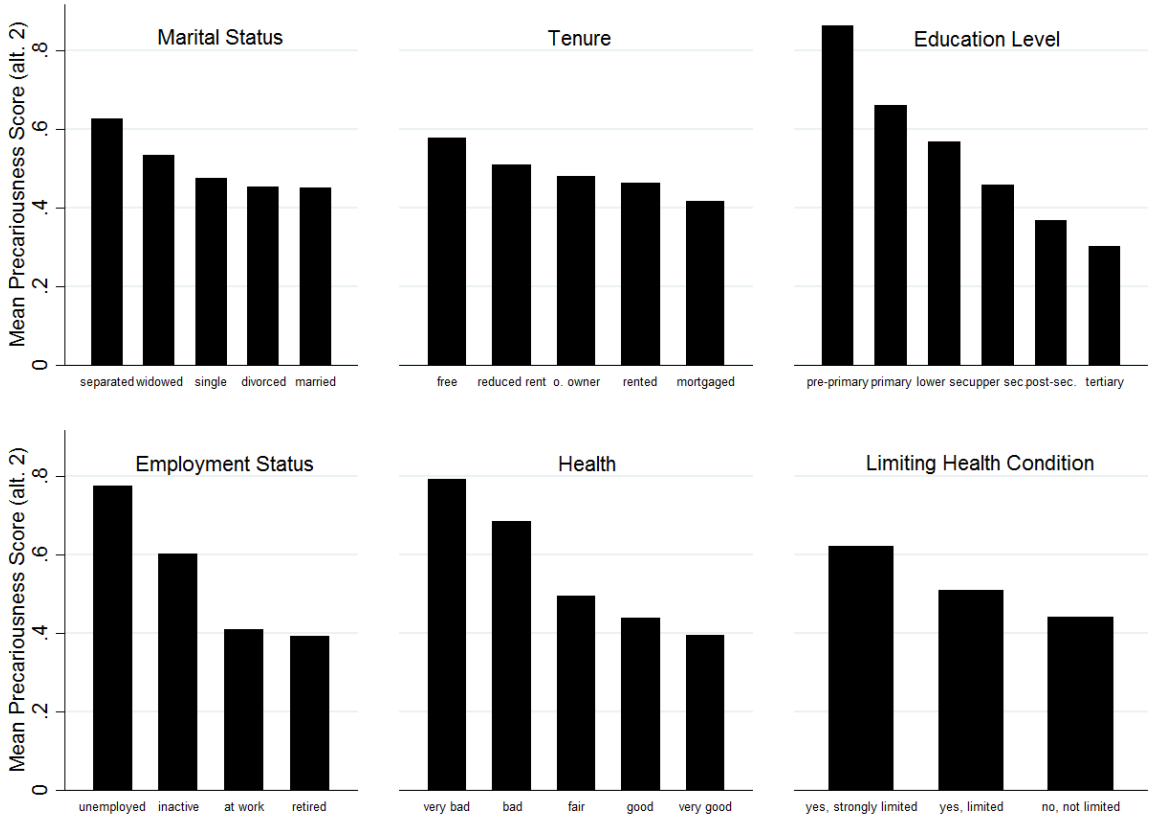
Web Appendix Figure 1. Mean Housing Precariousness Scores according to relevant characteristics (alternative precariousness measure 1)



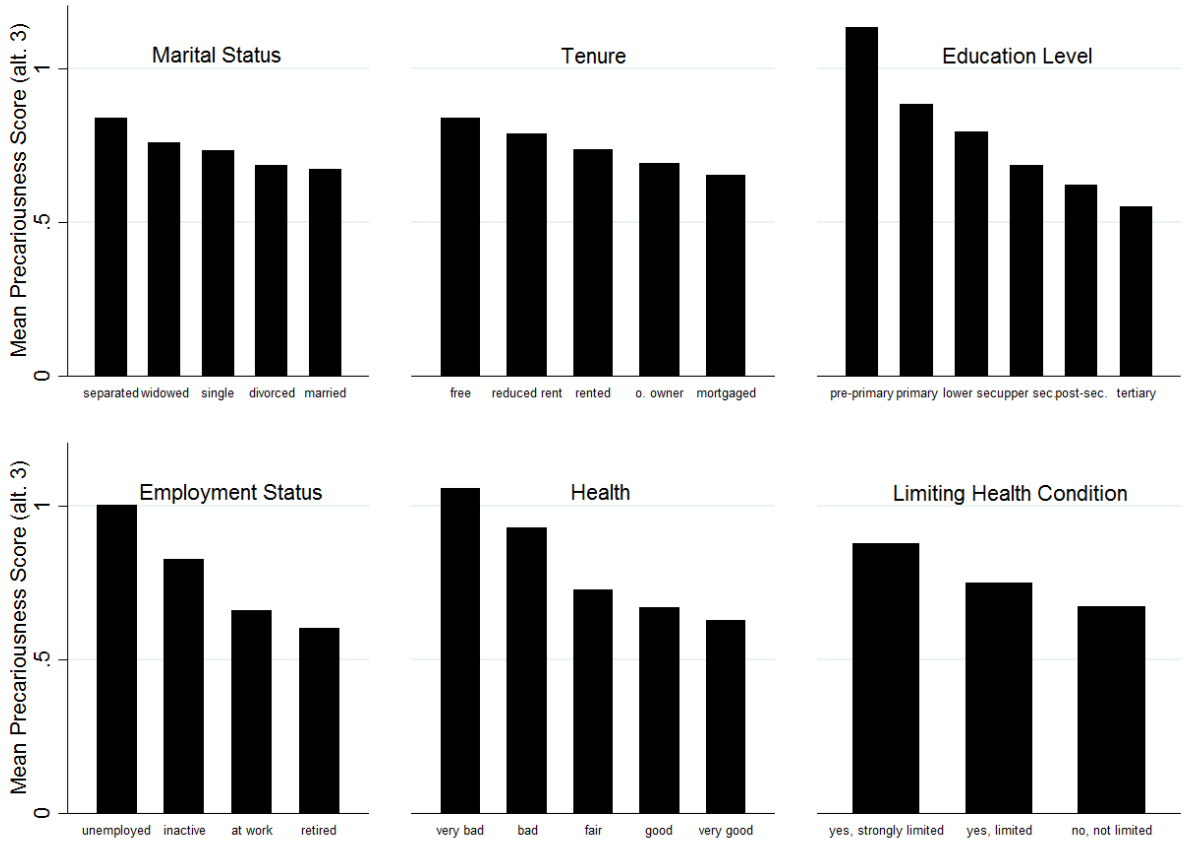
Web Appendix Figure 2. Mean Precariousness Scores across countries (alternative precariousness measure 1)



Web Appendix Figure 3. Mean Housing Precariousness Scores according to relevant characteristics (alternative precariousness measure 2)



Web Appendix Figure 4. Mean Housing Precariousness Scores according to relevant characteristics (alternative precariousness measure 3)



Web Appendix Table 1: Housing Precariousness Measure construction

Housing Precariousness Measure Components	Cross-National Indicators from EU-SILC	Percentage experiencing precariousness on this measure
Affordability	• Burden of housing costs	35.7%
Security	• Forced change in previous dwelling, or risk of forced change in current dwelling	7.24%
Quality and facilities	• Presence of leaks and/ or damp • Presence of essential utilities - bath/shower • Presence of essential utilities - toilet • Ability to keep home warm in winter • Ability to keep home cool in summer • Overcrowding	17.3%
Access to essential services	• Access to Grocery services • Access to Banking services • Access to Postal services • Access to Public transport • Access to Health care	13.2%

Box 1. Examples of existing approaches to housing precariousness

Nettleton and Burrows, 2001 (UK): Precariousness applied as referring to home ownership only, primarily in relation to repossession.

Pendall et al., 2012 (USA): Precariousness was operationalised using the following indicators:

- tenure (rented);
- household type (multi-family);
- overcrowding;
- affordability;
- age of property

Wood et al., 2015 (Australia and the UK): A study of precarious ownership, focussed on people exiting home ownership.

Beer et al., 2015 (Australia): "Households were defined as precariously housed if they experienced two or more of the following:

- housing costs (rent/mortgage) in excess of 30% of gross household income;
- they lived in a private rental property;
- or they experienced a forced move in the preceding 12 months"