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mental health across tenure and age cohorts:
The case of the Netherlands**

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Linking housing affordability stress and mental health across tenure and age cohorts: The case of the Netherlands

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Abstract

This paper examines changing trends in housing affordability in the Netherlands and its link to mental health across tenures and age cohorts. Using the LISS panel dataset over 11 years (2008 to 2019), we assess trends in the prevalence of unaffordable housing and subsequently examine its relationship with psychological wellbeing based on 'Mental Health Inventory 5' responses. Our research shows a clear overall increase in the experience of unaffordable housing. Increases are, however, starkly differentiated by tenure and age, occurring almost entirely within the rental sector and disproportionately affecting younger adults. We also find a clear link between housing unaffordability and poorer mental health scores, and this association is particularly strong among renters and younger people. The results underscore how changes in housing systems have intensified housing precarity, specifically within the rental sector, and reveal how this may contribute to worsening mental health at the population level.

Introduction

Recent years have seen a growing crisis of housing affordability across advanced economies (see Wetzstein 2017; Nijsskens et al. 2019; Kallergis et al. 2018; IMF, 2020). While understandable attention has been focused on how affordability problems undermine access to housing, particularly for younger generations, the outcomes extend well beyond the acquisition of housing. Building on a well-established body of research on the links between housing conditions and health, recent research has brought attention to the relationship between poor housing affordability and the psychological wellbeing of residents. This paper turns to the case of the Netherlands to, first, understand recent patterns of housing unaffordability across age cohorts and tenure and, secondly, explore the links with self-reported mental health. We begin by outlining the broader housing, labour and state transformations that have exacerbated housing affordability problems before turning to the existing literature on potential links with mental health and wellbeing. Our empirical study adds to the current limited understanding of population-wide trends in housing unaffordability and its links to mental health. While we make use of the Dutch

case, the Netherlands presents a salient context of housing market pressures common to many advanced economies.

Housing affordability crisis

Over the past decade or so, much attention has been given to housing affordability crises prevalent across many countries, particularly in major urban centres (Wetzstein 2017; Nijskens et al. 2019). This appears especially intensified in countries that have less regulated housing sectors, have seen stronger housing financialization, and exhibit increasing flows of investment capital into housing (Fernandez & Aalbers, 2016; Dewilde, 2018; Forrest & Hirayama, 2015). Recent decades have only seen worsening housing shortages and affordability across most countries as evidenced by rising cost-to-income ratios both in terms of house prices and rents (Kallergis et al. 2018; IMF, 2020; OECD, 2020). Growing housing unaffordability clearly has serious implications for household and individual wellbeing – from presenting barriers to accessing suitable housing, to financial difficulties in meeting other necessities, to an increased (perceived) risk of eviction and housing loss.

The study presented here turns to the case of the Netherlands which, on the one hand, represents a context of uniquely high levels of social housing provision, relatively robust tenancy rights and welfare protection (Haffner et al. 2008; Hoekstra, 2003) and, on the other hand, exhibits the declining housing affordability common to other advanced economies (Eurostat, 2020a). Like the Dutch case, many countries have experienced broadly increasing housing prices over the longer-term with an acceleration in recent decades (Ahir & Lougani, 2020; Eurostat, 2020b), most intensely in major cities (Arundel & Hochstenbach 2020, Hochstenbach & Arundel 2020; Nijskens et al. 2019). Rising house prices have outpaced income increases and undermined affordability for starters on the housing market. Concomitantly, rising rents have put substantial pressure on rental affordability (Eurostat 2020a; Dewilde 2018).

Particularly following the GFC, increasing housing costs have collided with growing labour market precarity, especially among younger adults, alongside more restricted access to credit (Arundel & Doling, 2017). This has resulted in declining access to homeownership among new households across advanced economies with an attendant shift towards growing shares in, often more precarious, private rental (Dewilde, 2020; Lennartz et al. 2016; Ronald & Lennartz, 2019). This has also been evidenced in the Dutch context with a recent resurgence of private rental (Hochstenbach & Ronald, 2020; Hochstenbach et al., 2020) – once a relatively marginal tenure – as many households are no longer able to access the declining social housing sector (van Gent & Hochstenbach, 2020) nor make the step into, increasingly unaffordable, homeownership (Lennartz

et al., 2019). A recent study in the Netherlands pointed to what could be called a ‘double trend of dualization’ in both labour and housing markets, where divides have increased between more protected market-insiders and more precarious market-outsiders across the interrelated domains of employment and housing (Lennartz & Arundel, 2020).

More broadly, the housing affordability crisis has been fueled by longer-term processes of housing commodification and financialization which have seen increased flows of capital into housing (Aalbers, 2016; Aalbers & Christophers 2014; Rolnik, 2013). Expanded mortgage markets and access to cheaper credit both increased indebtedness risk and worsened affordability through rising prices given the greater debt leveraging for home purchasing (Saunders 1990; Ahir & Lougani, 2020). In other words, credit expansion and increased investment has seen a long-term inflation in real estate values across economies (Kohl, 2018; Aalbers 2008; Whitehead and Williams 2011). This contributes directly to affordability issues in homeownership entry for those without access to substantial capital (Allegré and Timbeau 2015) as well as being passed on to renters through higher rental costs. Such trends are apparent in the Dutch context as evidenced by recent research (see Arundel & Lennartz, 2020; CBS, 2020d).

Social housing decline, tenancy protection erosion and the rise of private rental

In concert with the privileging of homeownership and a neo-liberal re-regulation of housing markets and welfare regimes, most advanced economies have seen a retrenchment of social housing provision since the 1980s (Baker, et al. 2021; Scanlon et al. 2015; Flint, 2003). Although countries have differed in the size of the social stock and timing of restructuring, common trends have pointed to ongoing residualization (Scanlon et al., 2015; Fitzpatrick and Pawson, 2014; Malpass, 2004). While cases such as the UK’s Right-to-Buy have galvanized the most attention, more gradual declines in countries with traditionally strong social housing sectors have progressively undermined access to affordable housing, particularly for new households (Lennartz et al., 2016; Dewilde, 2020). Although the Netherlands still exhibits the highest social housing share among advanced economies, this belies a longer-term reduction over the past several decades which has significantly undermined access to the sector (Elsinga & Wassenberg, 2014; van Gent & Hochstenbach, 2020). In major cities, for example, waiting lists for social housing usually exceed a decade while restrictive income requirements exclude many that still struggle to afford in market sectors (Hochstenbach & Ronald, 2019; Jonkman, 2020).

In the face of social housing retrenchment and homeownership unaffordability, many countries have experienced a significant growth (or resurgence) of the private rental sector

(Lennartz et al., 2016; Hochstenbach & Ronald 2020; Rowley et al. 2017), especially accelerated in the years following the Global Financial Crisis. As Kemp (2015:601) has argued, the revival of private rental presents a neglected yet ‘important sub-plot to the GFC story.’ In the Netherlands, private rental has long been more marginal, however, recent years have seen a shift towards its increase, particularly in major urban areas and university cities (Hochstenbach & Ronald, 2020; Hochstenbach et al., 2020; Dol & Kleinhaus, 2012). Although this need not necessarily translate to growing precarity, as most regulations apply across social and private sectors, in practice, its rise has – unsurprisingly given investment motivations – mostly involved a growth in liberalised ‘free-market’ units and often under temporary contracts.

Alongside common trends in the growth of private rental, many countries saw a weakening of tenancy protections, either in terms of tenure security or rent regulation (Byrne, 2020; Kemp, 2015). These policy shifts further undermined safeguards against unaffordability and precarity among tenants. Compared to liberal English-speaking contexts such as the US, UK, Australia and Canada that are characterized by much weaker tenancy protections (Pawson et al., 2017; Desmond, 2016), the Netherlands has traditionally had strong tenant rights. A large share of rental housing, including most of the social stock and a proportion of private dwellings, fall under regulations that set maximum rental costs through the *woningwaardestelsel*¹ based on dwelling characteristics (Rijksoverheid, 2021a). Rent increases within the regulated (social) sector are limited to a set annual maximum usually correlated to inflation. In the liberalised sector, annual permitted changes are not proscribed but must fall within a ‘reasonable’ level comparable to similar properties (Rijksoverheid, 2021b; Huisman, 2016a). Tenant stability has also been historically strongly safeguarded, with standard unlimited terms and eviction allowed in rare circumstances (Haffner et al., 2008; Huurcommissie, 2021).

On the one hand, these circumstances point to a secure housing sector that protects against unaffordable rental costs and, even when payment is hindered, reduces prospects of eviction. While this remains true for many existing tenants, the Dutch case has been one of ongoing erosion of both affordability protection and tenant security (Huisman, 2016a). First, rental costs have seen sharp increases (CBS, 2020b). While rent rises have been most prominent in the private sector, increases above inflation have also occurred over many years in the rent-

¹The *woningwaardestelsel* is a point-based system that assesses dwellings based on a set of criteria, such as size, amenities, quality and tax value. Up to a threshold, maximum rents are proscribed. Dwellings beyond this level (which related to a maximum rent of €752 per month in 2021) fall into the liberalized sector without any rent caps (Rijksoverheid, 2021a).

regulated social sector (CBS, 2020b; Nijskens et al., 2019). This means that even households entering the social sector are more likely to have a higher cost burden than previous generations. Second, the criteria for dwellings to fall within the rent-regulated threshold has been weakened (Hochstenbach & Ronald, 2020), leading to more classified in the liberalised sector without restrictions on rents for new tenancies. Thirdly, there has been a significant move away from unlimited tenancies with the introduction of different forms of temporary contracts. These were firstly allowed under specific circumstances but since 2016 temporary contracts were legally established as a regular category (Huisman, 2016a; 2016b; 2020). As expected, changes have particularly affected younger cohorts entering new leases. While official data is limited, a recent study of the largest Dutch rental listings agency found half of all listings in 2020 offered only temporary contracts (NOS, 2020, December 8th).

While the Netherlands *comparatively* remains a context with a large social housing sector and relatively strong tenancy protection, taken together, the dynamics described above imply an ongoing shift in diminished housing affordability and security. Given that regulation shifts have focused on new entrants and largely left protections of existing tenancies unaffected, their impacts disproportionately fall on recent cohorts. While among middle-to-higher income households, the story has been of a tenure change from rental to homeownership, lower-to-middle income populations have seen a generational shift towards worsening affordability and security. This increased housing precarity for younger generations has been amplified by reduced labour market security (Lennartz & Arundel 2020; Kalleberg, 2018) and reductions in the welfare safety net (OECD, 2021d; van Kersbergen et al. 2014).

The implications of such developments are not only that younger cohorts are more likely to face housing unaffordability, but that such an experience may also imply a higher likelihood of insecurity and housing loss than for previous generations. This entails that the negative ramifications of housing affordability stress may have increased. Therefore, the shifting housing, labour and welfare context over recent years may affect both the likelihood of facing housing unaffordability and its potential impact on wellbeing, including in terms of mental health, as outlined subsequently. Given contextual shifts and differentiated impacts across generations, unpacking these dynamics over time and across age cohorts is of crucial relevance.

Linking Housing and Health

Empirical associations between housing circumstances and health outcomes stretch back to the foundational work of John Snow (1855). Across contexts, populations, and housing types, there is

evidence that quality, security, affordability, tenure and location are all associated, or causally-related, to health outcomes. Herein, we unpack the implicated links between affordability and mental health, with particular focus on the modifying role of tenure.

While the housing and health evidence base is quite well developed, within it, the less tangible to measure dimensions – such as the link between affordability and mental health – have only recently received attention. Nascent research across various national contexts, including Australia (Bentley et al., 2011; 2019; 2020; Mason et al., 2013), Canada (Dunn, 2020), the United States (Pollack et al., 2010), and the United Kingdom (Reeves et al., 2016), has begun to demonstrate that the experience of unaffordable housing may have a significant negative impact on mental wellbeing. Work in Australia has revealed a causal relationship between housing becoming unaffordable and worsened mental health among low-income households (Bentley et al., 2011). Building on this, Baker et al. (2020) demonstrated that both prolonged and intermittent periods of time spent in unaffordable housing had a similar negative mental health effect. Further, we know that the experience of unaffordable housing works in combination with other disadvantages (such as employment insecurity) to increase negative mental health effects (Bentley et al., 2019). Housing affordability problems appear, however, strongly differentiated by tenure in many contexts, with a subset of research underscoring health and wellbeing of renters versus homeowners related to the former experiencing higher costs, reduced security and housing quality issues (Mason et al., 2013; Pollack et al., 2010; Pevalin et al., 2008; Kearns et al., 2000). Further research has shown a related wellbeing advantage of outright over (precariously) mortgaged owner-occupiers (Smith et al., 2017).

Related literature in the social sciences has underscored the link between housing security and broader notions of psychological wellbeing and sense of security (Giddens 1991; Clapham 2011). Housing, on the one hand, involves direct conditions of material (in)security and, on the other, is entangled in societal expectations of ideal life-course trajectories. This is perhaps most pronounced in ‘homeowner societies’ – exemplified by liberal English-speaking countries – where an ideology of homeownership has both promoted normative expectations of its superior status and seen its privileging in policies (Ronald, 2008; Ronald & Lennartz, 2019). In contexts where homeownership is thus a key marker of adulthood or ‘full citizenship’, long-term renting can be perceived as a ‘flawed’ and ‘transitory’ state (Flint, 2003; 2004). Housing conditions thus entangle both normative perceptions of status and real material conditions. In many countries, housing policies have intensified tenure differences through the privileging of homeownership at the expense of the quality and security of rental options (Ronald 2008; Forrest and Hirayama 2015).

The Netherlands presents a somewhat contradictory context where a large, high-quality social rental sector traditionally represented a normalized secure and long-term option, however, it has also seen growing homeownership in recent decades alongside policies privileging owner-occupation (Aalbers et al., 2020).

The Research

This paper addresses the lacunae in research on the link between housing unaffordability and mental health and wellbeing and how this is differentiated across age cohorts and tenure. Adding to limited research from liberal welfare regime contexts (see Baker et al. 2019; 2020; Pollack et al. 2010), we investigate these dynamics within the salient case of the Netherlands, representing a more protected welfare and housing context but one which has seen substantial restructuring in recent years. Making use of the LISS panel dataset described below, we examine changes in the prevalence of housing unaffordability from 2008 to 2019 and differentiated across age and tenure. Our approach looking at both trends over the years and age cohorts is crucial in considering how the changing welfare and housing system context may influence the experience of housing affordability and its impacts on mental health. In other words, an average 25-year old in 2008 may face a significantly different housing, labour and policy context than a young adult of the same age a decade later.

Methods

Data

The analyses make use of the LISS Panel (Longitudinal Internet Studies for the Social Sciences) from 2008 to 2019. We have intentionally excluded 2020 given the strongly confounding impact of the Covid-19 crisis. The LISS dataset, repeated longitudinally on an annual basis, consists of a ‘true probability sample’ which is derived from the full population register of the Netherlands (LISS Panel, 2021a). Refreshment samples are drawn at regular intervals and a stratified sample approach is employed to increase representativeness for difficult to reach population groups (LISS Panel, 2021b). As we are interested in those who are active in the housing system and of working age, we restrict our sample to individuals between 25 and 65 years old and exclude people who have not left the parental home. When further discounting cases with missing data on our key variables, this results in a sample of just over 14,000 individuals, or about 1500 to 1900 per year depending on the wave.

Housing measures

Tenure. Each individual was given a tenure status based on whether their household was designated as in homeownership or rental. Unfortunately, it is not possible in LISS to distinguish private versus social rental. Changing conditions within the rental category thus reflect both shifts towards increasing shares in private rental as well as changes within the social sector where new entrants face higher costs than previous generations (CBS, 2020b). We also separate out a small residual group of ‘other’ tenures (such as rent-free, institutional arrangements) representing less than 3% of our sample – included in the pooled analyses but excluded in comparisons between rental versus homeownership.

Housing Cost. A monthly housing cost value was generated for all households. For homeowner households, housing cost was based on monthly mortgage capital and interest repayments. For rental households, the cost value was based on monthly rent. Due to data limitations and inconsistencies over the data period, it was not possible to include utilities or other costs (i.e. homeowner association, insurance, maintenance, service fees) in the assessed housing cost. While costs here can thus be considered as the ‘base’ housing cost, they represent the best consistent measure available across tenures and time. The use of a base housing cost also motivates our over 30% of income affordability threshold, described below, whereas some researchers have used 40% with complete/inclusive housing costs.

Housing affordability stress. In our assessment of housing affordability, we combined the above housing cost measure with the household income situation based on the ‘30/40’ rule that has been commonly applied in housing affordability research (see Baker, et al., 2015; Nepal et al. 2010). Individuals were thus considered as being in ‘housing affordability stress’ (HAS) when their households’ housing costs exceeded 30 percent of their gross household income and in turn, their gross household income was in the bottom 40th percentile of the national distribution. This combination measure of high housing costs and being in a lower income position presents a more accurate means of capturing actual financial hardship, whereas crude housing cost to income ratios alone may falsely include circumstances for higher income households who still retain ample disposable income (Nepal et al., 2010). Given the relative nature of the measure, entering HAS can thus arise from a change in either or both housing costs or income, while the latter may also be impacted by changes in household composition.

Mental health measure

For mental health we made use of self-assessed health questions from the ‘Mental Health Inventory 5’ (MHI-5) which is a standard set of five questions used to assess psychological wellbeing established within the Short Format 36 (SF-36) questionnaire. The SF-36 is a commonly used self-completion measure providing a comparable international instrument for health assessment (Coons et al., 2000). The MHI-5 questions are applied in several key surveys by Statistics Netherlands and included in the LISS Panel. The MHI-5 is based on five questions on self-reported psychological wellbeing that ask respondents the frequency over the past months of having been/feeling: (1) ‘very nervous’, (2) ‘so down in the dumps that nothing could cheer you up’, (3) ‘calm and peaceful’, (4) ‘downhearted and blue’, and (5) ‘a happy person’ (for specific Dutch version see CBS, 2020c). Based on the MHI-5, the mental health measure was standardized into the commonly-used Mental Health Component Score (MCS) providing an index ranging from 0 to 100 where a higher number indicates a better health status (conventionally with a mean of around 70 and a standard deviation of 10). This mental health measure thus corresponds to the standard assessment carried out in much international mental health research.

Empirical analyses

Our study examines changing cohort characteristics divided into four age groups of 25-to-34, 35-to-44, 45-to-54, and 55-to-64 years old. We begin by looking at descriptive statistics across three time periods of equal length:² 2008-2011, 2012-2015, and 2016-2019. We then analyse the prevalence of housing affordability stress (HAS) from 2008 to 2019 across our selected age cohorts and subsequently differentiated by housing tenure. Controlling for income, tenure and age, we then model how the probability of *entering* housing affordability stress has changed over this period, as well as, the probability of *exiting* among households experiencing HAS. We make use of the longitudinal data to calculate probabilities based on the situation in the previous year, hence from 2009 onwards.

Our subsequent analyses turn to the relationship between HAS and the self-assessed mental health index. Controlling for income and tenure, we explore differences in mental health scores between those with or without HAS and how this has developed over time. Controlling for income, we examine this separately for renters and homeowners, as well as, lastly, differentiated across the age cohorts. Our exploratory analyses thus provide a key empirical foundation to trends in housing

² Time divisions also roughly reflect three housing market stages: an initial post-crisis period with house prices largely stagnating at a high level, a more rapid decline from 2012 reaching a nadir in 2013/14, and a subsequent substantial increase again in the economic recovery period from 2015/16 onwards (CBS 2020d).

unaffordability and their potential association with mental health while untangling moderating age and tenure dynamics.

Results

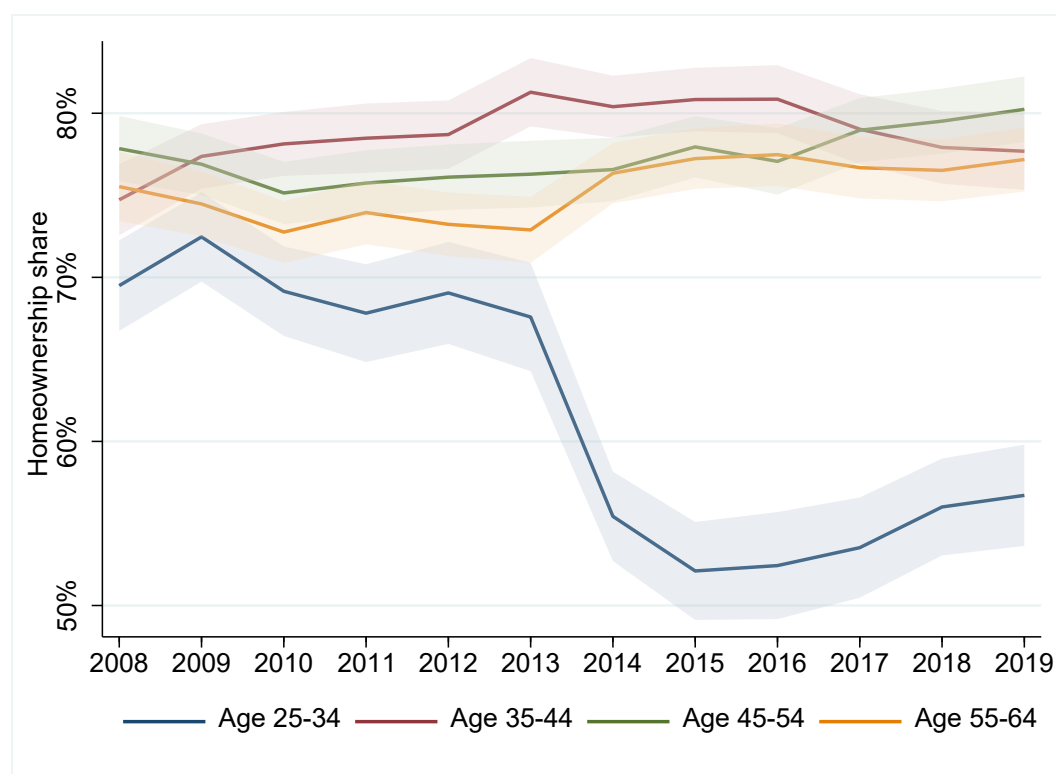
Descriptive statistics by age cohort over time periods

Table 1 presents descriptive statistics by age cohort over three time periods, providing an overview of the housing, mental health and socio-economic characteristics for our dataset. Several patterns of interest are apparent in terms of generational developments in housing inequalities. Looking at the inflation-adjusted housing costs, we find a clear increase across the three time periods for all age groups except for the oldest, 55-64 year-olds, who in fact have seen declining costs. Additionally, a strong tenure shift is apparent among the youngest age group. This is visualized in Figure 1 showing homeownership shares by age over time. While most age groups are quite stable – or older cohorts have experienced gradual increases – we see a clear divergence in attainment rates for 25-34 year-olds, who have experienced steep homeownership declines in the post-GFC years with only minimal recovery more recently. This mirrors other international research highlighting declining homeownership among young adults post-GFC (i.e. Lennartz et al. 2017). We note that LISS exhibits a higher representation of homeowners as compared to other sources, albeit reflects similar trends.

Table 1. Descriptive overview of the LISS sample by age cohorts over three periods

	2008-2011								2012-2015								2016-2019							
	Age 25-34		35-44		45-54		55-64		25-34		35-44		45-54		55-64		25-34		35-44		45-54		55-64	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Age	30.2	2.7	39.6	2.8	49.5	2.9	59.4	2.9	30.0	2.9	39.8	2.9	49.6	2.9	59.6	2.9	29.8	2.8	39.7	2.9	49.6	2.9	59.6	2.9
Mental health MCS ^(a)	73.1	16.0	73.8	16.3	74.0	17.3	75.6	16.1	73.1	14.4	73.5	15.4	74.9	15.8	76.4	15.2	71.9	16.1	71.8	16.4	74.7	16.3	76.5	16.7
Housing costs ^(b)	8.4	11.5	9.7	17.2	8.2	23.1	9.3	45.9	8.8	8.5	11.1	14.5	10.7	32.3	7.9	19.3	9.3	11.5	13.4	49.4	11.89	39.6	7.8	21.1
Household income ^(b)	53.7	122.0	52.7	30.9	61.6	96.1	60.0	171.0	47.4	33.4	52.8	33.7	55.7	34.1	56.3	279.0	53.0	31.4	61.0	31.7	63.5	41.7	63.3	290.3
	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n
Tenure																								
Homeowner	69.8	2045	77.2	3533	76.4	3969	74.1	3967	59.8	1680	80.3	3468	76.8	3895	75.0	4202	54.7	1546	78.9	2968	78.9	3596	77.0	4079
Renter	28.1	823	21.2	970	20.2	1049	23.9	1280	37.3	1048	18.0	777	20.6	1045	22.8	1277	41.6	1176	19.9	749	20.3	925	22.4	1187
Other tenure	2.1	62	1.6	73	3.5	182	2.0	107	2.9	81	1.7	73	2.6	132	2.3	129	3.6	102	1.2	45	0.8	36	0.7	37
Without HAS ^(c)	91.3	1416	92.8	2196	94.7	2698	92.8	3430	83.4	1248	89.4	1832	90.9	2382	89.8	3334	83.8	1353	88.9	1470	88.1	1882	88.7	2800
With HAS ^(c)	8.7	135	7.2	170	5.3	151	7.2	266	16.6	248	10.6	217	9.1	239	10.2	379	16.2	262	11.1	183	11.9	254	11.3	357
Female	55.7	1632	52.0	2380	52.3	2717	50.7	2714	56.5	1587	52.4	2263	51.5	2612	52.2	2924	55.9	1580	53.6	2016	50.6	2306	52.2	2766
Household type																								
Couple w/ children	36.1	1058	64.9	2970	58.1	3018	18.9	1012	30.2	848	63.4	2738	61.0	3094	23.5	1316	25.7	726	58.8	2212	59.5	2712	28.4	1505
Couple w/o children	41.1	1204	16.4	751	22.7	1179	61.7	3303	40.8	1146	16.6	717	18.2	923	55.1	3087	41.1	1161	19.7	741	18.7	852	48.2	2554
Single w/ children	2.6	76	5.7	261	5.8	301	2.6	139	2.0	56	5.1	220	6.8	345	3.3	185	2.5	71	4.6	173	6.8	310	3.5	185
Single	17.9	524	12.5	572	12.0	623	16.0	857	24.2	680	14.4	622	12.8	649	16.7	936	27.0	763	16.2	609	13.8	629	17.5	927
Education																								
Below high school	4.0	117	5.1	233	6.4	332	11.3	604	2.4	67	3.8	164	4.6	233	7.7	431	2.0	56	3.1	116	3.6	164	6.2	328
High school	20.3	594	27.3	1248	36.6	1898	43.6	2332	15.0	418	22.3	961	33.7	1705	38.7	2164	10.6	299	17.8	666	29.0	1318	35.6	1885
Junior college	33.0	966	34.8	1590	24.7	1281	16.8	898	31.2	870	35.9	1547	28.6	1447	21.8	1219	28.2	795	34.4	1287	32.4	1473	23.6	1249
University	29.7	870	23.8	1088	24.1	1250	20.8	1112	31.7	884	25.3	1090	23.6	1194	22.9	1281	33.3	939	28.5	1066	24.4	1109	25.9	1371
Ethnic background																								
Native Dutch	84.3	490	84.0	751	87.7	926	89.1	1077	81.7	1978	83.2	3148	86.4	3809	87.9	4284	78.5	1847	77.9	2470	83.5	3270	86.1	3875
Non-western	9.1	53	8.4	75	4.9	52	2.9	35	10.6	257	8.5	322	6.0	264	3.7	180	13.0	306	11.2	355	8.0	313	5.5	248
Western	6.5	38	7.6	68	7.4	78	8.0	97	7.6	184	8.2	310	7.6	335	8.4	409	8.5	200	10.9	346	8.5	333	8.4	378
Urban density																								
Extremely urban	18.4	537	14.2	649	12.0	623	11.3	605	23.3	647	15.0	643	13.3	671	12.3	686	29.3	818	17.2	640	14.1	639	12.6	663
Very urban	29.2	853	25.4	1160	26.1	1356	26.5	1418	29.8	828	24.9	1068	24.3	1226	26.5	1478	26.9	751	27.0	1005	22.4	1015	24.4	1283
Moderately urban	20.4	596	24.1	1101	24.1	1252	23.0	1231	18.4	511	24.8	1064	23.1	1166	24.5	1367	16.0	447	20.1	748	22.4	1015	23.8	1251
Slightly urban	19.6	572	21.0	959	20.9	1086	23.6	1263	17.4	483	21.3	914	21.3	1075	20.8	1160	14.9	416	19.2	715	21.9	992	20.4	1073
Not urban	12.3	359	15.3	699	16.8	873	15.5	830	11.0	306	14.0	600	17.9	903	16.0	893	12.9	360	16.5	614	19.1	865	18.8	989
No. observations	2930		4577		5195		5354		2809		4319		5072		5602		2826		3762		4558		5298	

Notes: ^(a) MCS refers to the common Mental Health Component Score derived from the MHI-5 ‘Mental Health Inventory 5’, representing a standard set of five questions used to self-assess psychological wellbeing. ^(b) Housing costs and household income are measured annually in 1000s, inflation-adjusted converted to 2015 euros. ^(c) Housing affordability stress (HAS) defined as spending > 30% of household income on housing costs and household is bottom 40% of household income nationally

Figure 1: Homeownership shares by age cohorts over time in the Netherlands

Data source: LISS Panel 2008-2019

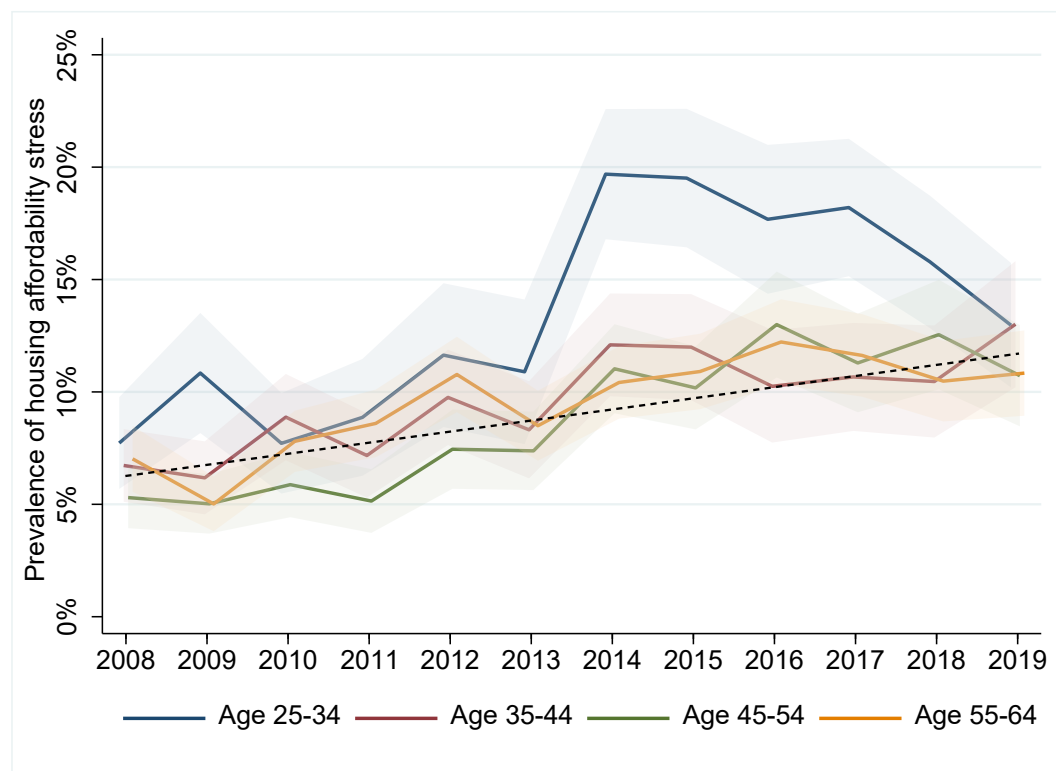
Notes: Data at individual level, excludes respondents living in parental home. 90% Confidence Intervals displayed.

Trends in housing affordability stress by age and tenure

We next turn to trends in housing affordability stress (HAS). Figure 2 shows HAS prevalence for our full sample and by age cohort from 2008-2019. The first striking result is a clear overall increase in working-age people experiencing HAS over the period as indicated by the trendline in the graph (and which increased from 6.6% to 11.6% among our full sample). When looking at HAS by age, we find relatively similar trends for all age groups 35 and over, however, the youngest group stands out. From about 2013, young adults 25 to 34 years old exhibit much higher rates of HAS, reaching nearly double the levels found among most other cohorts. A plateau of higher HAS among younger adults is apparent for several years with a gradual return to rates on par with other ages by the end of our data period. In sum, the results point to a widespread and clear increase in HAS in the Netherlands from 2008 to 2019 across all age cohorts, alongside a specific spike in HAS for the youngest group in the mid-to-late 2010s. When we consider tenure trends (Figure 1), we can see an alignment between this spike in HAS and declining homeownership among this age group. This correlates broadly with the post-GFC period when labour and housing market deterioration was most prominent in the Netherlands and which disproportionately impacted younger adults (OECD 2021a; OECD 2021b). The combination of worsening labour market positions alongside

stricter mortgage regulations resulted in many young adults unable to enter homeownership and being pushed into private rental (Lennartz et al. 2017). The worsened income and employment opportunities particularly among young adults together with higher housing costs in the private rental market likely underlie the increase in HAS among the younger cohort.

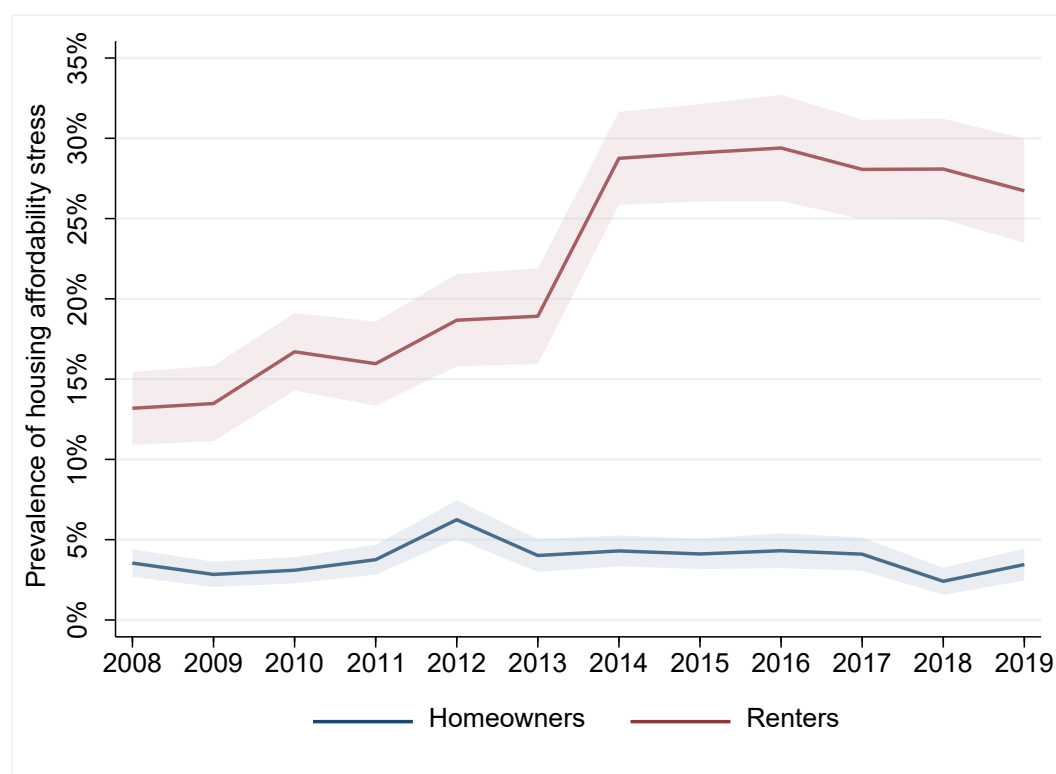
Figure 2: Prevalence of housing affordability stress across age cohorts 2008-2019



Data source: LISS Panel 2008-2019

Notes: Data at individual level, excludes respondents living in parental home. 90% Confidence Intervals displayed for the different age groups. Dashed line indicates trend for the full sample (25 to 64 year-olds).

This dynamic is further supported in examining housing affordability by tenure. Figure 3 presents HAS rates for homeowners and renters. What is immediately clear is that renters have consistently faced significantly higher rates of HAS. On top of this, we see a dramatic increase in affordability stress among renters from about 2013 onwards supporting the idea that, as labour conditions worsened, affected populations concentrated within – and were pushed into – the (private) rental sector. While our classification combines private and social rental, the share of more affordable social housing within this category declined over this period (Hochstenbach et al., 2020; van Gent & Hochstenbach, 2020), further implying rising rental costs and driving HAS. Conversely, we find that homeowners display a strikingly stable pattern with HAS rates largely remaining under 5% over the period – contrasting significantly to renters which already start at about three times more and then rise to over seven-fold higher.

Figure 3: prevalence of housing affordability stress (HAS) by tenure

Data source: LISS Panel 2008-2020

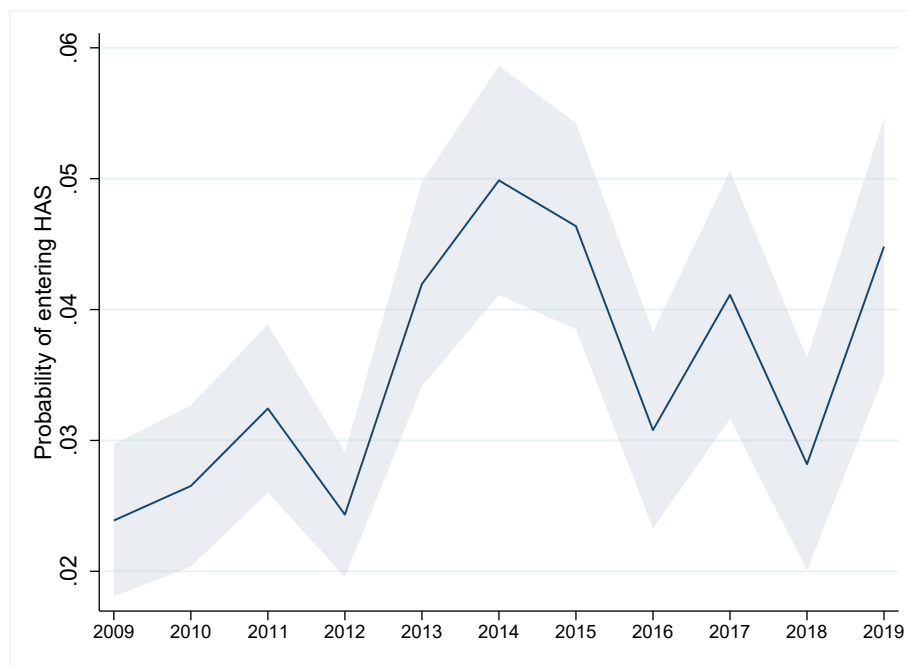
Notes: Data at individual level, excludes respondents living in parental home. 90% Confidence Intervals displayed.

Probability of entering and exiting housing affordability stress over time

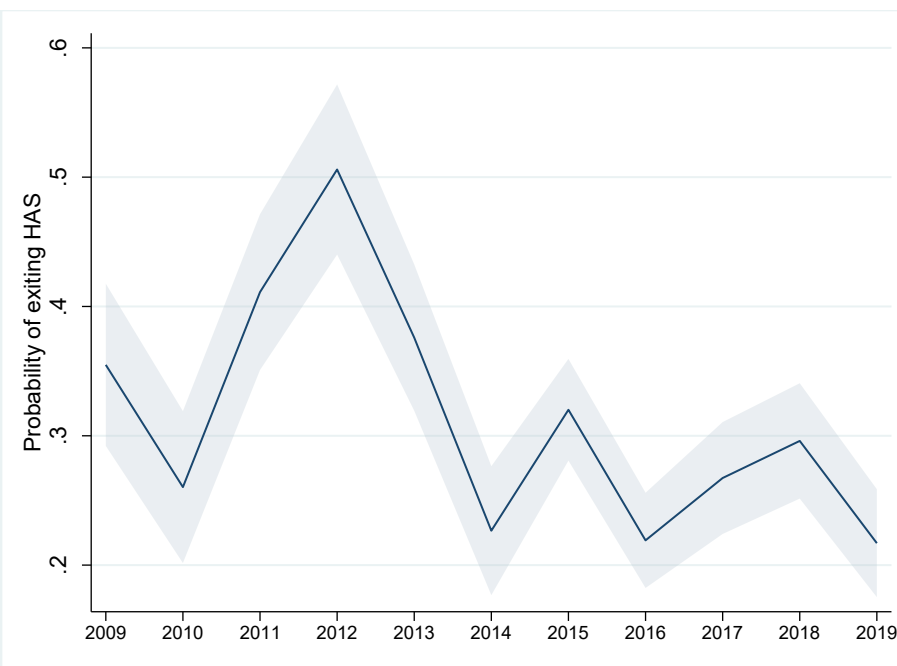
We subsequently modelled probabilities of entering and exiting HAS (Figure 4) over time, while controlling for income, tenure and age group. The results for both show substantial volatility over the years making it more difficult to discern clear trends. Nonetheless, for entering HAS (Figure 4a), we find, broadly-speaking, a period of relatively lower probability in the early years of the dataset and a subsequent noticeable jump after 2012/13. While substantial volatility remains thereafter, probabilities of HAS entry remain at a higher average. This seems to generally support the pattern of rising precarity and unaffordability in the Dutch housing system increasing chances for households newly entering affordability stress. Figure 4b, presents the probability of exiting *among* those already experiencing HAS. Although trends are again muddled by substantial volatility, a reverse pattern is broadly discernable, with probability of exiting HAS being on average lower in recent years. Overall, this indicates that alongside an increase in the likelihood of falling into HAS, the ability to exit has become more difficult even after controlling for changes in income, tenure and age. Relatedly, this implies an increased probability of staying in HAS for longer periods.

Figure 4. Expected probability of entering and exiting housing affordability, controlling for income, tenure and age-group

(a) Entering housing affordability stress



(b) Exiting housing affordability stress

*Data source:* LISS Panel 2008-2019

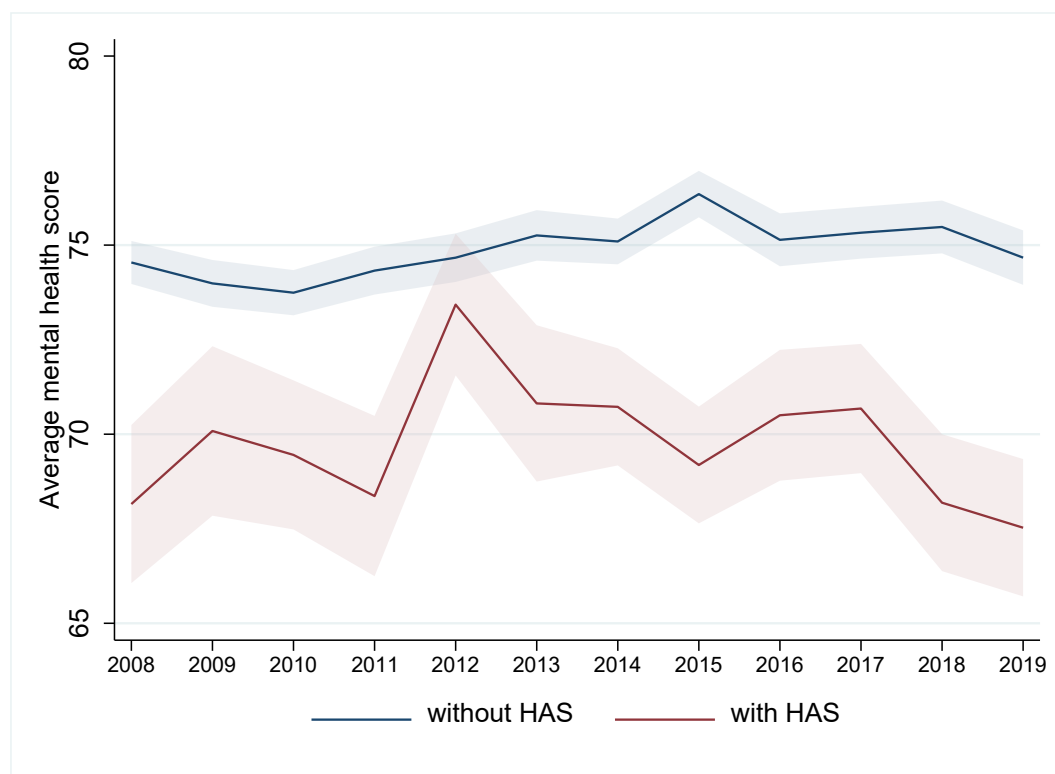
Notes: Data at individual level, excludes respondents living in parental home. Different y-axis scales presented since probability of entering is based on those not in HAS in previous year, while exiting is based on only those within HAS in the previous year. 90% Confidence Intervals displayed.

Mental health and its relation to housing affordability stress

Our second focus of the paper examines the relationship between HAS and reported mental health outcomes. We first examine mental health scores for our full sample comparing those with or without housing affordability stress, controlling for income and tenure (Figure 5). What the results show is that there is a strong difference in mental health scores between the two populations. People with HAS report consistently poorer mental health conditions than those without HAS. While there was some convergence between the two groups up to 2012, the story since has been of clearly declining mental health scores among those in HAS versus a largely stable situation for those without. This trend, since 2012 at least, lends support to the notion of worsening opportunities in the housing market contributing to an additional mental health penalty when experiencing housing unaffordability.

The spike we see around 2012 indicating less differentiation in mental health between the two groups is somewhat unexpected but may be the result of at least two different (but not mutually exclusive) possible explanations. Firstly, this may be a story of ‘social comparison’ effects. The period correlates with when the strongest impacts of the GFC were apparent and, given so much attention on deteriorating economic conditions, those in HAS may have felt *relatively* less worse-off leading to a smaller penalty on psychological wellbeing. The second explanation relates to the (perceived or real) impacts of the crisis on the housing market that either temporarily allowed more flexibility and affordability, or provided a sense of increased potential opportunities to leave HAS. This does align with the period of more rapid declines in housing prices, alongside interest rate cuts, before a subsequent return to price growth a bit over a year later (CBS, 2020d). While it may have also related to more people just ‘dipping’ into HAS but at a more minimal level over this period, this is not supported by further analysis separating out trends in marginal, medium and more severe HAS (see Appendix 1). While still low in absolute shares, we did find in our supplementary analyses a more recent increase among those experiencing ‘severe HAS’ (defined as housing costs over 50% of income) which may help explain the subsequent further divergence in mental health scores.

Figure 5. Average mental health score (MHI-5) for those with and without housing affordability stress (HAS) over time, controlling for income and tenure



Data source: LISS Panel 2008-2019

Notes: Data at individual level, excludes respondents living in parental home. 90% Confidence Intervals displayed.

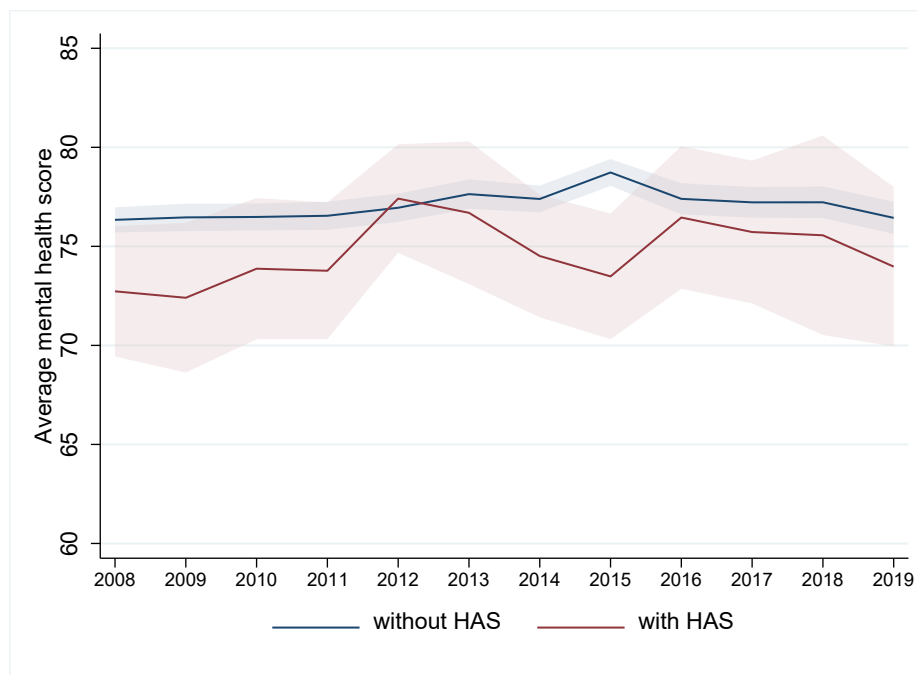
Figure 6 further untangles the relationship between HAS and mental health scores by tenure. The picture again reveals, after controlling for income, the consistently higher mental health scores among homeowners versus renters. A remarkable finding is that experiencing HAS as a homeowner relates to only a minimal reduction in mental health scores which is largely not significantly different from those without HAS. Indeed, homeowners with HAS appear to fare slightly better even than renters without affordability stress. While it might be expected that homeowners have ‘a lot to lose’ in the face of unaffordable mortgage costs, what may explain the small mental health penalty could be two-fold: first, the fact that it is a more stable tenure given very low rates of foreclosure and protective measures against this in the Dutch context (see NVB, 2021) and, secondly, that many homeowners have also built up (substantial) assets in their home that they may rely on if a move is required. We further acknowledge that homeownership may correlate with other unmeasured factors that relate to improved mental health beyond the scope of this paper. As supplementary analyses, we also ran our analyses while additionally controlling for gender and ethnicity (see Appendices 2 to 4) and encountered highly similar results. When looking at only renters, we find parallel trends to the full sample, however, with consistently lower

mental health scores. It appears thus that renters in HAS face a double disadvantage, where being a renter itself is a predictor of lower scores and HAS as a renter is further correlated with stronger reductions in mental wellbeing.

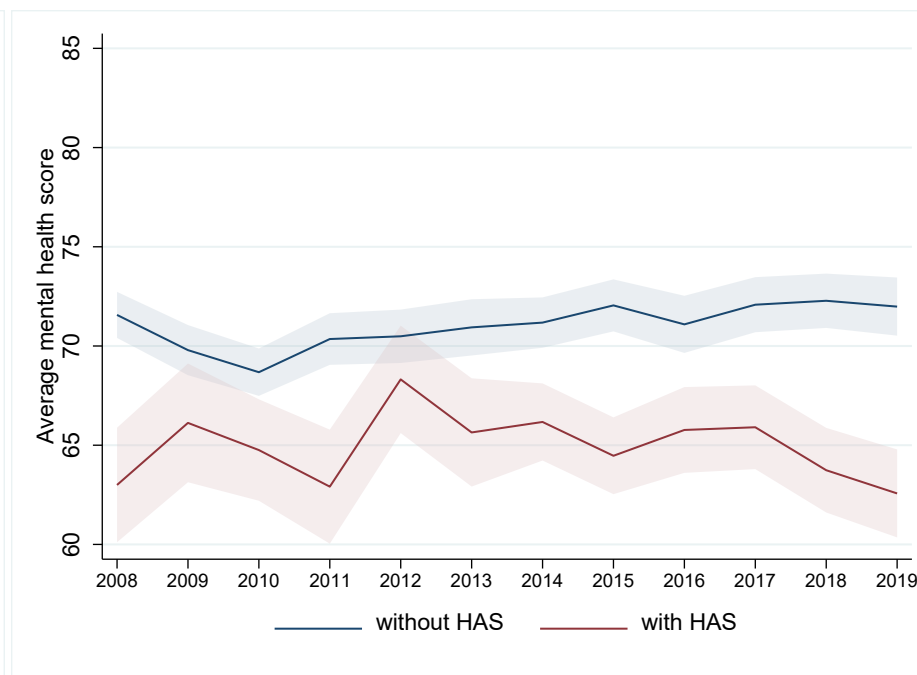
Our final analyses differentiate these dynamics by age cohorts. We examine trends in mental health for those with and without HAS across our age groups for our full sample (Figure 7), for only homeowners (Figure 8) and only renters (Figure 9). We control again for income and, for the full sample, also tenure. One caveat is that given selections, some subgroups are based on smaller samples (i.e. young homeowners in HAS) leading to less precision, as indicated by the wider CI bands. Further analyses were run including gender and ethnicity as controls yielding highly similar findings (provided in Appendices 2 to 4). Looking at the full sample differentiated by age (Figure 7), we find a relation between being in HAS and lower mental health scores across all age cohorts. However, separating the data by age shows some clear differences between younger and older populations and in trends over time. When considering the whole period, the oldest group of 55 to 64 year-olds exhibit on average the smallest mental health differences between HAS and HAS-free. This could be explained by older populations being able to rely more on other assets or savings beyond income. For the two older groups, we don't find any clear patterns in changing impacts over time. However, the youngest two age groups have seen an increasingly strong mental health penalty when being in HAS since about the early-to-mid 2010s. This represents a marked change as in previous years these cohorts displayed minimal mental health effects of HAS. The cohort that has seen the strongest shift towards worsening mental health scores given HAS are those aged 35-44 with a sharp decline since 2012. This group reports mental health scores a full 10-15 points lower than their counterparts without HAS. As this age range also correlates with the likelihood of having young children, this may be explained by an additional stress in navigating adequate and affordable family housing. While we are not able to untangle this in our exploratory analyses, the intersection between family formation, housing unaffordability and mental health provides a valuable direction for future research.

Figure 6. Average mental health score (MHI-5) by tenure for those with and without housing affordability stress (HAS) over time, controlling for income.

(b) Homeowners



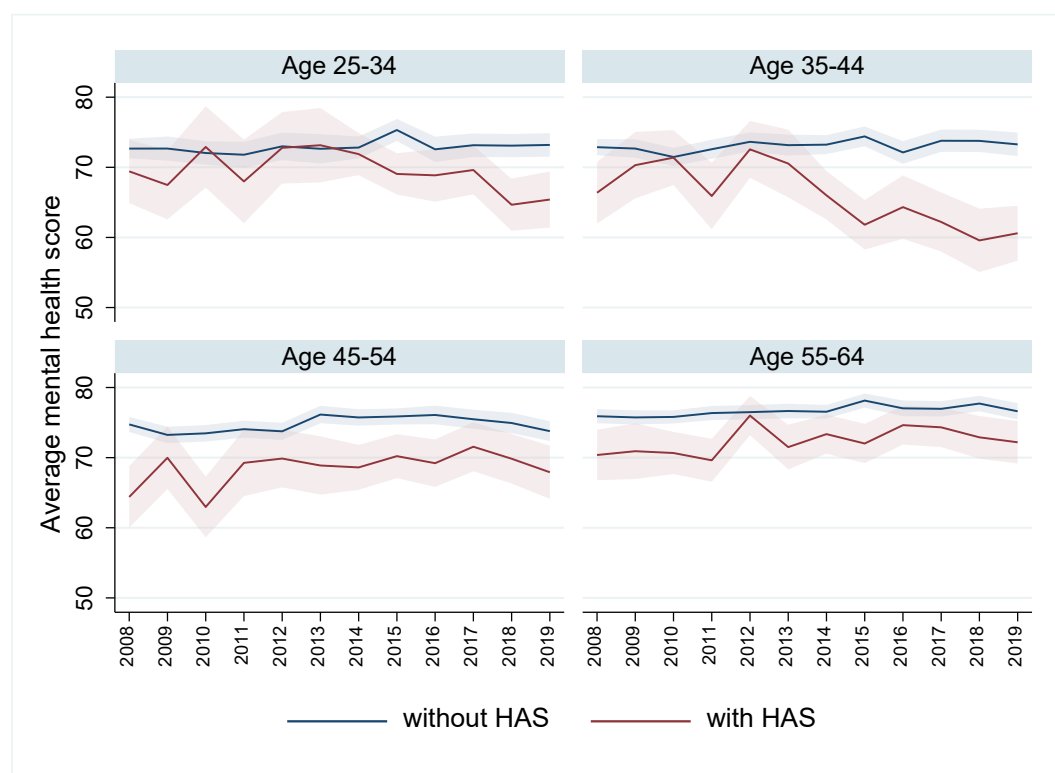
(b) Renters



Data source: LISS Panel 2008-2019

Notes: Data at individual level, excludes respondents living in parental home. The predictive margins at 90% CI are displayed

Figure 7. The difference in average mental health score for those in housing affordability stress versus HAS-free by age over time, controlling for income and tenure.



Data source: LISS Panel 2008-2019. Notes: Data at individual level, excludes respondents living in parental home. The 90% Confidence Intervals are displayed.

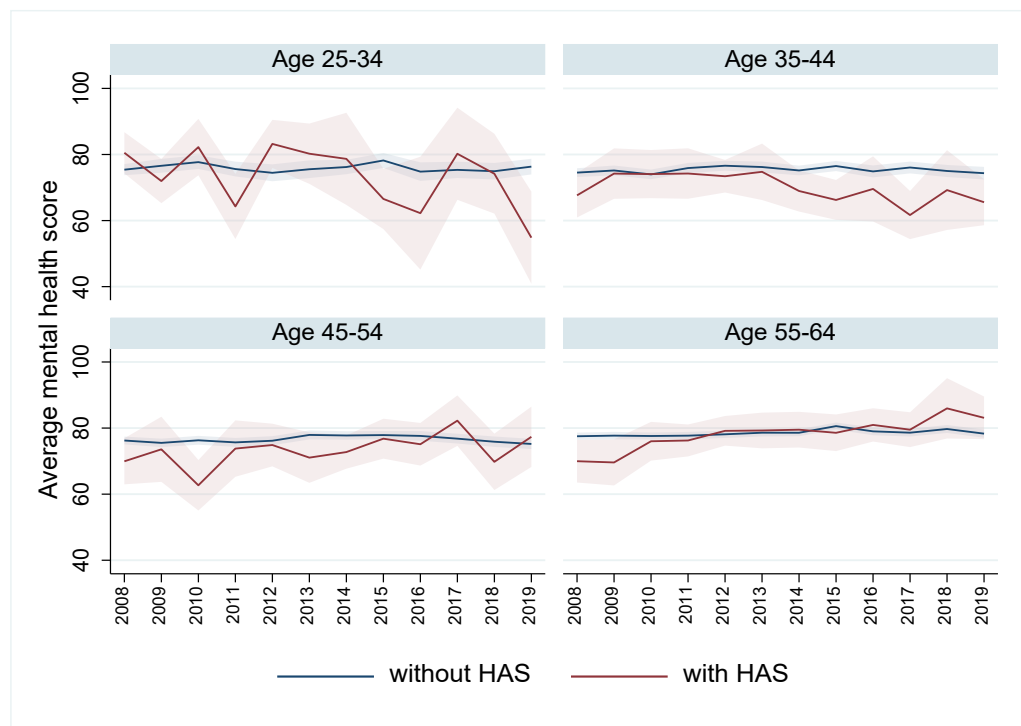
In our final analyses we look at HAS effects by age cohorts for homeowners versus renters, while controlling for income. For renters (Figure 8), we again see lower overall mental health scores and stronger effects for those in HAS as compared to homeowners (Figure 9). Among renters, the clearest trend is once more a substantial divergence among those 35 to 44 year-olds since the early 2010s, where previously there was little discernible difference in mental health scores between those in HAS or not. A somewhat similar trend is seen for the youngest group although the divergence is not very pronounced. Homeowners, on the other hand, display no clear differentiation between HAS and HAS-free. The only noteworthy exception is again for 35 to 44 year-olds where, in some recent years, mental health scores are slightly lower for those facing housing unaffordability.

Figure 8. The difference in average mental health score for those in housing affordability stress versus HAS free among renters by age over time, controlling for income.



Data source: LISS Panel 2008-2019. Notes: Data at individual level, excludes respondents living in parental home. The 90% Confidence Intervals are displayed.

Figure 9. The difference in average mental health score for those in housing affordability stress versus HAS free among homeowners by age over time, controlling for income.



Data source: LISS Panel 2008-2019. Notes: Data at individual level, excludes respondents living in parental home. The 90% Confidence Intervals are displayed.

Conclusion

Our research has shown a clear growth in the share of people facing housing unaffordability in the Dutch context. This trend, however, is not evenly distributed across the population and appears starkly differentiated by tenure and age. The growth in housing affordability stress (HAS) has occurred almost entirely within the rental sector, in a context where private rental has captured growing shares of the population unable to enter a declining social sector and increasingly unaffordable homeownership. While those in rental already experienced a higher prevalence of unaffordability, rates have greatly increased to about 25-30% of renters facing HAS in recent years. Modelling probabilities further points to a discernable increase in the likelihood of entering HAS whereas exiting has become more difficult.

These results reflect the shifting context of the Dutch housing system, outlined at the start of this paper, which has involved a variety of processes exacerbating housing unaffordability, including: reduced social housing, rising house prices and rental costs, and the growth of the liberalised private rental sector (Eurostat, 2020a; 202b; Dewilde, 2020; Hochstenbach & Ronald, 2020; van Gent & Hochstenbach, 2020). This has additionally been accompanied by labour market deterioration impacting incomes and employment security (OECD 2021a; Arundel & Doling, 2017; Kalleberg, 2018). Many developments have disproportionately affected new entrants to housing and labour markets whereas many existing ‘insiders’ have remained relatively protected (Arundel & Lennartz, 2020). Such dynamics are reflected in our results with young adults disproportionately experiencing HAS compared to older cohorts.

Notwithstanding the exploratory nature of the study, a strong link between experiencing housing unaffordability and worsened reported mental health is also supported by our findings. Here, again, tenure plays a key moderating role with the association much more pronounced among renters who both already report lower mental health scores *and* exhibit a greater ‘penalty’ when facing HAS. We also find a clear trend towards divergence in recent years with worsening mental health among those experiencing unaffordability. This provides support for the hypothesized increase in the negative outcomes of being in HAS given the shifting housing and policy context. Beyond affordability itself, related changes in the Dutch housing context have intensified housing precarity, specifically within the rental sector. As a greater share of rental has been in the liberalised sector (Gemeente Amsterdam, 2020; Hochstenbach & Ronald, 2020) and policy changes have increasingly introduced more temporary contracts and eroded tenant security (Huisman, 2016a; 2016b; 2020), the stability of rental in the Dutch context has been undermined. Rising housing costs (CBS, 2020d) have also meant constrained opportunities of finding alternatives should a

move be necessitated. The data confirms an apparent growing mental health penalty of being in HAS which could be explained by such increasing housing precarity and reduced alternative options. This is alongside supplementary analyses carried out that also pointed to some increases in the intensity of unaffordability experienced. Finally, age once again was an important factor in whether HAS correlated with a mental health penalty and the extent of the effect. While the oldest working-age group saw less differentiation, it is particularly renters in the 35-44 cohort that display a growing divergence in reported mental health between those with HAS or without. As this age largely correlates with having young children, this points to a potential additional avenue of research that considers the interaction of family formation with housing affordability and mental health.

Taken together, the research provides a valuable empirical examination of trends in housing affordability stress within the Dutch context and explores how housing unaffordability may relate to mental health and wellbeing. Crucially, the study emphasizes the strong moderating role of tenure and age in such dynamics. The findings point to a growing housing affordability crisis and demand greater attention for problematic outcomes beyond access to housing itself. As housing unaffordability and precarity intensifies, a greater share of the population is likely to face substantial financial stress with potentially serious attendant consequences on mental and psychological wellbeing. These impacts do not fall evenly, however, and appear particularly concentrated among those unable to enter homeownership and among younger adults. The Netherlands provides a salient case which both retains a more protected tenancy and affordable housing context but also exemplifies common shifts that have occurred across many countries towards welfare residualization, erosion of tenancy protections, and processes of housing marketization and financialization. Our exploratory empirical analyses herein compel further research across international contexts into the unequal dynamics of housing unaffordability and its potential crucial implications for health and wellbeing.

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References

- Aalbers, M.B, Hochstenbach, C., Bosma, J., & Fernandez, R. (2020). The death and life of private landlordism: How financialized homeownership gave birth to the buy-to-let market. *Housing, Theory and Society*, 1-23.
- Aalbers, M.B. (2008). The financialization of home and the mortgage market crisis. *Competition & change*, 12(2), 148-166.
- Aalbers, M.B. (2016). *The financialization of housing: A political economy approach*. New York, NY: Routledge.
- Aalbers, M.B., & Christophers, B. (2014). Centring housing in political economy. *Housing, theory and society*, 31(4), 373-394.
- Ahir, H., & Loungani, P. (2020). Global House Prices: Trends and Cycles. In *Oxford Research Encyclopedia of Economics and Finance*.
- Allegré, G., and Timbeau, X. 2015. “Does Housing Wealth Contribute to Wealth Inequality? A Tale of Two New Yorks.” Sciences Po publications. Sciences Po.
<http://EconPapers.repec.org/RePEc:spo:wpmain:info:hdl:2441/59b514afcq8qdb7ih17aej5f5k>
- Arundel, R. (2017). *The end of mass homeownership?: Housing career diversification and inequality in Europe*. (thesis). Universiteit van Amsterdam.
- Arundel, R., & Doling, J. (2017). The end of mass homeownership? Changes in labour markets and housing tenure opportunities across Europe. *Journal of Housing and the Built Environment*, 32(4), 649-672.
- Arundel, R., & Hochstenbach, C. (2020). Divided access and the spatial polarization of housing wealth. *Urban Geography*, 41(4), 497-523.
- Arundel, R., & Lennartz, C. (2020). Housing market dualization: linking insider–outsider divides in employment and housing outcomes. *Housing Studies*, 35(8), 1390-1414.
- Baker, E., Bentley, R. and Mason, K., (2013). The mental health effects of housing tenure: causal or compositional?. *Urban Studies*, 50(2), pp.426-442.
- Baker, E., Lester, L., Mason, K., & Bentley, R. (2020). Mental health and prolonged exposure to unaffordable housing: a longitudinal analysis. *Social psychiatry and psychiatric epidemiology*, 55(6), 715-721.
- Baker, E., Mason, K., & Bentley, R. (2015). Measuring housing affordability: A longitudinal approach. *Urban policy and research*, 33(3), 275-290.
- Baker, E., Pham, A., Leishman, C., Daniel, L., & Bentley, R. (2021) Urban Social Housing Pathways: A Linked Administrative Data Analysis. *Urban Policy and Research* 39 (1), 1-15.

- Bentley, R., Baker, E., & Aitken, Z. (2019). The ‘double precarity’ of employment insecurity and unaffordable housing and its impact on mental health. *Social Science & Medicine*, 225, 9-16.
- Bentley, R., Baker, E., Mason, K., Subramanian, S. V., & Kavanagh, A. (2011). Association between housing affordability and mental health: a longitudinal analysis of a nationally representative household survey in Australia. *American Journal of Epidemiology*, 174(7), 753-760.
- Byrne, M. (2020). Generation rent and the financialization of housing: A comparative exploration of the growth of the private rental sector in Ireland, the UK and Spain. *Housing Studies*, 35(4), 743-765.
- CBS [Statistics Netherland]. (2020a). *StatLine: Voorraad woningen; eigendom, type verhuurder, bewoning, regio*.
<https://opendata.cbs.nl/statline/#/CBS/nl/dataset/82900NED/table?ts=1606925144554>
- CBS [Statistics Netherland]. (2020b). *Grootste huurstijging in zes jaar*. <https://www.cbs.nl/nl-nl/nieuws/2020/37/grootste-huurstijging-in-zes-jaar>
- CBS [Statistics Netherland]. (2020c). *MHI-5: Mental Health Inventory 5*. <https://www.cbs.nl/nl-nl/achtergrond/2015/18/beperkingen-in-dagelijkse-handelingen-bij-ouderen/mhi-5>
- CBS [Statistics Netherland]. (2020d). *Bestaande koopwoningen; verkoopprijzen; regio; prijsindex 2015=100*. <https://opendata.cbs.nl/#/CBS/nl/dataset/83913NED/table>
- Coons, S.J., Rao, S., Keininger, D. L., & Hays, R. D. (2000). A comparative review of generic quality-of-life instruments. *Pharmacoeconomics*, 17(1), 13-35.
- Desmond, M. (2016). *Evicted: Poverty and profit in the American city*. Crown.
- Dewilde, C. (2018). Explaining the declined affordability of housing for low-income private renters across Western Europe. *Urban Studies*, 55(12), 2618-2639.
- Dewilde, C. (2020). Exploring young Europeans’ homeownership opportunities. *Critical Housing Analysis*, 7(1), 86-102.
- Dol, K., & Kleinhans, R. (2012). Going too far in the battle against concentration? On the balance between supply and demand of social housing in Dutch cities. *Urban Research & Practice*, 5(2), 273-283.
- Dunn, J.R., (2020).. Housing and healthy child development: known and potential impacts of interventions. *Annual Review of Public Health*, 41, pp.381-396.
- Elsinga, M., & Wassenberg, F. (2014). Social housing in the Netherlands. In Scanlon, K., Whitehead, C., & Arrigoitia, M. F. (Eds.). *Social housing in Europe*. John Wiley & Sons.

- Eurostat (2020a). *Evolution of house prices and rents*. Retrieved 2 June 2021.
<https://ec.europa.eu/eurostat/cache/digpub/housing/bloc-2a.html>
- Eurostat (2020b). *Housing price statistics - house price index*. Retrieved 2 June 2021.
https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Housing_price_statistics_-_house_price_index#Long_term_trends_in_House_prices_and_rents
- Fernandez, R., & Aalbers, M. B. (2016). Financialization and housing: Between globalization and varieties of capitalism. *Competition & change*, 20(2), 71-88.
- Fitzpatrick, S., & Pawson, H. (2014). Ending security of tenure for social renters: Transitioning to ‘ambulance service’ social housing? *Housing Studies*, 29(5), 597-615.
- Flint, J (2003) Housing and ethopolitics: Constructing identities of active consumption and responsible community. *Economy and Society* 32(4): 611–629.
- Flint, J. (2004). The responsible tenant: Housing governance and the politics of behaviour. *Housing studies*, 19(6), 893-909.
- Forrest, R., & Hirayama, Y. (2015). The financialisation of the social project: Embedded liberalism, neoliberalism and home ownership. *Urban Studies*, 52(2), 233-244.
- Gemeente Amsterdam (2020) *Wonen in Amsterdam 2019: Woningmarkt*. Amsterdam: Gemeente Amsterdam.
- Green, D.G., and D. Bentley. 2014. *Finding Shelter: Overseas Investment in the UK Housing Market*. London: Civitas.
- Haffner, M., Elsinga, M., & Hoekstra, J. (2008). Rent regulation: The balance between private landlords and tenants in six European countries. *European Journal of Housing Policy*, 8(2), 217-233.
- Haffner, M.E.A., Van der Veen, M., & Bounjouh, H. (2014). *TENLAW: Tenancy Law and Housing Policy in Multi-level Europe. National Report for the Netherlands*. https://www.uni-bremen.de/fileadmin/user_upload/fachbereiche/fb6/fb6/Forschung/ZERP/TENLAW/Reports/NetherlandsReport_09052014.pdf
- Heeringa, W. (Eds.). *Hot Property: The Housing Market in Major Cities*. Springer Nature: Cham, Switzerland.
- Hochstenbach, C., & Arundel, R. (2020). Spatial housing market polarisation: National and urban dynamics of diverging house values. *Transactions of the Institute of British Geographers*, 45(2), 464-482.

- Hochstenbach, C., & Ronald, R. (2020). The unlikely revival of private renting in Amsterdam: Re-regulating a regulated housing market. *Environment and Planning A: Economy and Space*, 52(8), 1622-1642.
- Hochstenbach, C., Wind, B., & Arundel, R. (2020). Resurgent landlordism in a student city: urban dynamics of private rental growth. *Urban Geography*, 1-23.
- Hoekstra, J. (2003). Housing and the welfare state in the Netherlands: an application of Esping-Andersen's typology. *Housing, Theory and Society*, 20(2), 58-71.
- Huisman, C.J. (2016a). A silent shift? The precarisation of the Dutch rental housing market. *Journal of Housing and the Built Environment*, 31(1), 93-106.
- Huisman, C.J. (2016b). Temporary tenancies in the Netherlands: From pragmatic policy instrument to structural housing market reform. *International Journal of Housing Policy*, 16(3), 409-422.
- Huisman, C.J., & Mulder, C. H. (2020). Insecure tenure in Amsterdam: who rents with a temporary lease, and why? A baseline from 2015. *Housing Studies*, 1-27.
- Huurcommissie (2021). *Voor huurwoningen in de vrije sector*. Retrieved 5 June 2021.
<https://www.huurcommissie.nl/over-de-huurcommissie/voor-huurwoningen-in-de-vrije-sector>
- IMF [International Monetary Fund]. (2020). Global Housing Watch.
<https://www.imf.org/external/research/housing/>
- Jonkman, A. (2020). Patterns of distributive justice: social housing and the search for market dynamism in Amsterdam. *Housing Studies*, 1-32.
- Kalleberg, A.L. (2018). Job insecurity and well-being in rich democracies. *The Economic and social review*, 49(3), 241-258.
- Kallergis, A., Angel, S., Liu, Y., Blei, A., Sanchez, N., & Lamson-Hall, P. (2018). *Housing affordability in a global perspective*. Lincoln Institute of Land Policy.
- Kearns, A., Hiscock, R., Ellaway, A., & Macintyre, S. (2000). 'Beyond four walls'. The psycho-social benefits of home: evidence from west central Scotland. *Housing studies*, 15(3), 387-410.
- Kemp, P.A. (2015). Private renting after the global financial crisis. *Housing Studies*, 30(4), 601-620.
- Kohl, S. (2018). More mortgages, more homes? The effect of housing financialization on homeownership in historical perspective. *Politics & Society*, 46(2), 177-203.
- Lennartz, C., Arundel, R., & Ronald, R. (2017). Younger adults and homeownership in Europe through the global financial crisis. *Population, Space and Place*, 22(8), 823-835.

- Lennartz, C., Baarsma, B., & Vrieselaar, N. (2019). Exploding house prices in urban housing markets: Explanations and policy solutions for the Netherlands. In Nijskens, R., Lohuis, M., Hilbers, P., &
- Lennartz, C., Haffner, M., & Oxley, M. (2012). Competition between social and market renting: a theoretical application of the structure-conduct-performance paradigm. *Journal of Housing and the Built Environment*, 27(4), 453-471.
- LISS [Longitudinal Internet Studies for the Social sciences]. (2021a) *LISS Panel: About the Panel*. Retrieved 5 June 2021. <https://www.lissdata.nl/about-panel>
- LISS [Longitudinal Internet Studies for the Social sciences]. (2021b) *LISS Panel: Sample and Recruitment*. Retrieved 5 June 2021. <https://www.lissdata.nl/about-panel/sample-and-recruitment>
- Malpass, P. (2004). Fifty years of British housing policy: Leaving or leading the welfare state?. *European journal of housing policy*, 4(2), 209-227.
- Mason, K.E., Baker, E. Blakely, T. & Bentley, R.J. (2013). Housing affordability and mental health: does the relationship differ for renters and home purchasers? *Social science & medicine* 94, 91-97.
- Nepal, B., Tanton, R., & Harding, A. (2010). Measuring housing stress: how much do definitions matter?. *Urban Policy and Research*, 28(2), 211-224.
- Nijskens, R., Lohuis, M., Hilbers, P., & Heeringa, W. (2019). *Hot Property: The Housing Market in Major Cities*. Springer Nature: Cham, Switzerland.
- NOS (2020, December 8). 'Helpt aangeboden huurcontracten inmiddels tijdelijk, 'flexibilisering schiet door'. NOS. <https://nos.nl/artikel/2359826-helpt-aangeboden-huurcontracten-inmiddels-tijdelijk-flexibilisering-schiet-door>
- NVB [Dutch Banking Association] (2021). Risks on the Dutch housing market Putting the Dutch housing market into European perspective. <https://www.nvb.nl/media/4448/1000799rep.pdf> (Accessed on 10 September 2021)
- OECD (2020). *Housing prices* (indicator). doi: 10.1787/63008438-en (Accessed on 2 December 2020)
- OECD (2021a), Youth unemployment rate (indicator). doi: 10.1787/c3634df7-en (Accessed on 12 September 2021)
- OECD (2021b), Housing prices (indicator). doi: 10.1787/63008438-en (Accessed on 1 October 2021)
- OECD (2021c), Social spending (indicator). doi: 10.1787/7497563b-en (Accessed on 1 October 2021)

- Pawson, H., Hulse, K., & Morris, A. (2017). Interpreting the rise of long-term private renting in a liberal welfare regime context. *Housing Studies*, 32(8), 1062-1084.
- Pevalin, D.J., Taylor, M.P., & Todd, J. (2008). The dynamics of unhealthy housing in the UK: A panel data analysis. *Housing studies*, 23(5), 679-695.
- Pollack, C.E., Griffin, B.A., & Lynch, J. (2010). Housing affordability and health among homeowners and renters. *American journal of preventive medicine*, 39(6), 515-521.
- Reeves, A., Clair, A., McKee, M., & Stuckler, D. (2016). Reductions in the United Kingdom's government housing benefit and symptoms of depression in low-income households. *American journal of epidemiology*, 184(6), 421-429.
- Rijksoverheid (2021a). *Huurcontract: sociale huurwoning of vrijesectorwoning*. Retrieved 2 June 2021. <https://www.rijksoverheid.nl/onderwerpen/woning-huren/vraag-en-antwoord/hoeveel-huur-betaal-ik-maximaal-voor-mijn-woning>
- Rijksoverheid (2021b). *Welke regels gelden er voor een huurverhoging?* Retrieved 2 June 2021. <https://www.rijksoverheid.nl/onderwerpen/woning-huren/vraag-en-antwoord/welke-regels-gelden-er-voor-een-huurverhoging>
- Rolnik, R. (2013). Late neoliberalism: the financialization of homeownership and housing rights. *International journal of urban and regional research*, 37(3), 1058-1066.
- Ronald, R. (2008). *The ideology of home ownership: Homeowner societies and the role of housing*. Palgrave Macmillan: New York.
- Ronald, R., & Kadi, J. (2018). The revival of private landlords in Britain's post-homeownership society. *New Political Economy*, 23(6), 786-803.
- Ronald, R., and Lennartz, C. (2019) "Declining Homeownership in Liberal, English Speaking Countries." In *The Routledge Handbook of Housing Policy and Planning*, pp. 117-125. Routledge.
- Rowley, S., Leishman, C., Baker, E., Bentley, R. and Lester, L. (2017) Modelling housing need in Australia to 2025, AHURI Final Report 287, Australian Housing and Urban Research Institute, Melbourne, <http://www.ahuri.edu.au/research/final-reports/287>, doi: 10.18408/ ahuri-8106901.
- Saunders, P. 1990. *A Nation of Home Owners*. London: Unwin Hyman.
- Scanlon, K., Fernández Arrigoitia, M., & Whitehead, C. M. (2015). Social housing in Europe. *European Policy Analysis*, (17), 1-12.
- Smith, S.J., Cigdem, M., Ong, R., & Wood, G. (2017). Wellbeing at the edges of ownership. *Environment and Planning A*, 49(5), 1080-1098.
- Snow, J. (1855). *On the Mode of Communication of Cholera*. John Churchill: London.

- van Gent, W., & Hochstenbach, C. (2020). The neo-liberal politics and socio-spatial implications of Dutch post-crisis social housing policies. *International Journal of Housing Policy*, 20(1), 156-172.
- Van Kersbergen, K., Vis, B., & Hemerijck, A. (2014). The Great Recession and Welfare State Reform: Is Retrenchment Really the Only Game Left in Town? *Social Policy & Administration*, 48(7), 883-904.
- Wetzstein, S. (2017). The global urban housing affordability crisis. *Urban Studies*, 54(14), 3159-3177.
- Whitehead, C., & Williams, P. (2011). Causes and consequences? Exploring the shape and direction of the housing system in the UK post the financial crisis. *Housing Studies*, 26(7-8), 1157-1169.

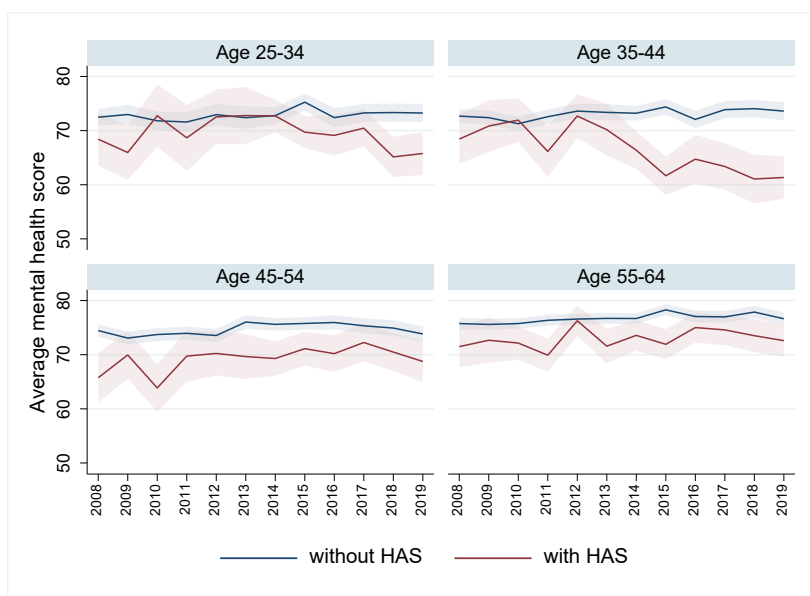
Appendices

Appendix 1: Trends in the prevalence of marginal, medium and severe housing affordability stress (HAS) over time in the Netherlands.



Data source: LISS Panel 2008-2019. Notes: Data at individual level, excludes respondents living in parental home. 90% confidence intervals displayed.

Appendix 2: The difference in average mental health score for those in housing affordability stress versus HAS-free by age over 2008-2019, controlling for income, tenure, gender and ethnicity



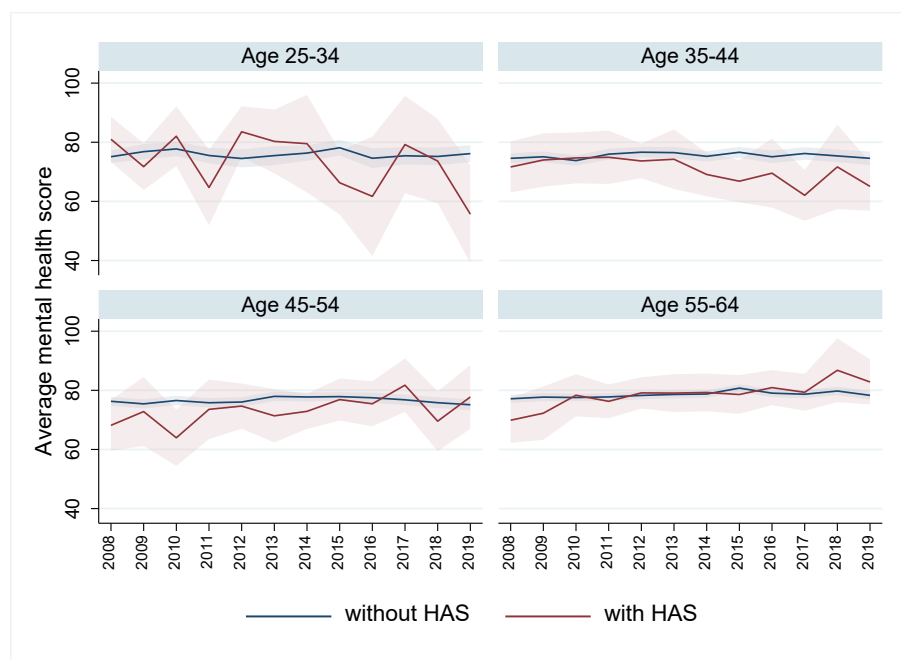
Data source: LISS Panel 2008-2019. Notes: Data at individual level, excludes respondents living in parental home. 90% confidence intervals displayed.

Appendix 3: The difference in average mental health score for those in housing affordability stress versus HAS free among renters by age over 2008-2019, controlling for income, gender and ethnicity



Data source: LISS Panel 2008-2019. Notes: Data at individual level, excludes respondents living in parental home. 90% confidence intervals displayed.

Appendix 4: The difference in average mental health score for those in housing affordability stress versus HAS free among homeowners by age over 2008-2019, controlling for income, gender and ethnicity



Data source: LISS Panel 2008-2019. Notes: Data at individual level, excludes respondents living in parental home. 90% confidence intervals displayed.