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Housing conditions of single mothers in Europe: the role of housing policies

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ABSTRACT

This study investigates housing conditions of single mothers in the context of housing policies. We study single mothers' probability to experience housing deprivation, overcrowded housing, overburdening costs of housing, and neighbourhood problems across European countries. We consider the structural consequences of home ownership rates, and policies related to regulation of rental markets, housing benefits and housing prices. We apply a multi-level framework to EU-SILC data on 21,937 single mothers, from 195 country-years and covering 21 European countries from 2008 to 2017. First, we find a trade-off in the provision of free housing or housing at reduced rents, that helps to reduce housing cost overburden for single mothers, but is also associated with higher rates of housing deprivation, overcrowding and neighbourhood problems. Next, in contexts with stricter rental market regulation, single mothers' housing deprivation is lower. Higher housing benefits reduce the risk of housing deprivation as well as overcrowding, but in contexts where home ownership is common, single mothers tend to experience more overcrowding. Single mothers are more likely to report neighbourhood problems in societies where housing prices are high. Our findings suggest that factors within the control of policy makers can be beneficial to the housing conditions of single mothers.

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KEYWORDS Housing conditions; housing deprivation; single mothers; housing benefits; rental market regulation; housing prices; unitary and dual housing system

Introduction

The difficult socio-economic circumstances of single mothers in rich democracies have received ample attention in research and policy. Single mothers have high poverty risks, lower average incomes, often rely on

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statutory income support and tend to have lower health outcomes compared to partnered mothers (Nieuwenhuis and Maldonado 2018). However, their housing conditions are rarely considered, despite the risk of inadequate housing to negatively affect children's education, behaviour and well-being (Clair 2019). Two factors make single mothers (and, by extension, their children) particularly vulnerable to lower-quality housing and neighbourhood conditions. First, they commonly fall within the lower end of the income distribution where the housing cost burden tends to be higher and housing conditions tend to be worse than for households with higher incomes (Pero *et al.* 2016; Pittini *et al.* 2015). Second, the formation of a single-mother household frequently involves urgent residential mobility under financial constraints, which often results in lower-quality housing and less desirable neighbourhoods (Mikolai and Kulu 2018). Because both inequalities in housing conditions between social groups and single mothers' disadvantage strongly depend on the institutional setting, we apply a country-comparative perspective in this study.

A key institutional factor in comparative research on housing outcomes is the structure of the housing system and associated housing policies. Two types of housing system are commonly distinguished: the unitary rental system, such as in Sweden and Austria, in which the extensive rental sector hosts both profit and non-profit providers; and the dual rental system, such as in Norway and Lithuania, with a small, shielded state-governed social housing sector and a less-regulated private renting sector (Kemeny 1995, 2001, 2006). The former tends to support better housing quality across tenure types (that is, including homes that are rented or owned-outright) and income groups due to competition between public and private providers (Dewilde 2017), but also appears to create a trade-off with more affordability issues for low-income households (Dewilde and Decker 2016). In countries with a dual rental system, by contrast, households have overall higher risks of lower-quality housing conditions (Borg 2015). So far, the links between housing systems and housing outcomes have mostly been studied at a population level, disregarding housing outcomes for specific social groups in different contexts (Dewilde 2017).

In this paper, we investigate housing conditions of single mothers in a comparative perspective across European countries answering two research questions: (1) what are the housing conditions – that is housing deprivation, overcrowding, cost overburden, and neighbourhood problems – of single mothers across European countries? And

(2) How does variation in single mothers' housing conditions relate to differences in housing systems and policies? These questions are highly topical both in light of the increasing share of women who experience single motherhood at some point in their lives (Bernardi *et al.* 2018), and considering recent trends in housing inequalities (Pero *et al.* 2016). Our study will contribute to the debate by describing and exploring the contexts in which single mothers do better in terms of housing.

Background and theoretical considerations

There is a general lack of attention to single mothers' housing conditions in the literature, particularly concerning the role of different institutional contexts. Two strands of literature provide some insights into single mothers' housing conditions across Europe. First, comparative research on the relationships between housing systems and inequalities in housing outcomes shows that institutions matter (Borg 2015; Dewilde and Lancee 2013). More recently, this literature moved away from comparing countries based on broad typologies of housing regimes, towards using various indicators of specific housing policies that comprise those regimes (Dewilde 2021). However, much of the research of housing policy tends to be at the population level, rather than looking at different types of tenure or specific social groups (Dewilde 2017). Second, an emerging literature, which studies the effects of demographic events and life course transitions on housing conditions, highlights the role of family structure for housing outcomes (Lersch 2013; Lersch and Dewilde 2018; Lersch and Vidal 2014; Mikolai and Kulu 2018). That research has, however, not considered the role of policies. Further, its focus on life transitions and reliance on longitudinal data restrict possibilities for a multi-country comparative view (but see Wind and Dewilde 2018). Here, we build on what was learned from using broad housing regimes, and will complement this by also measuring specific housing policies and their association with the housing conditions of a specific social group: single mothers. As such, we aim to provide such comparative view on housing conditions across European countries, in order to be able to distinguish individual from institutional factors related to single mothers' housing.

Housing systems and inequalities in housing conditions

Recent years have arguably seen a renewed interest in the question of how housing systems matter for inequalities in housing conditions. As a

central component in individuals' living conditions, housing is a major source of socioeconomic difference (Zavisca and Gerber 2016). Inequalities in housing conditions comprise differential risks of housing deprivation, overcrowding, affordability issues resulting in housing cost overburden, and neighbourhood problems across social groups. For example, costs for housing make up a particularly large share of the household income for income-poor households (Dewilde 2018; Quigley and Raphael 2004), which is one indicator for inequality in housing affordability.

Country variation in the levels of inequality in housing conditions is commonly explained by differences in institutional contexts. Comparative housing research offers various heuristics to make sense of institutional differences in housing contexts. A prominent theory was proposed by Kemeny (1995, 2001, 2006), who differentiated housing systems based on how much and in what form states get involved in the organisation of housing provision. He defined two types of housing systems based on the integration of their rental markets: the dual rental system and the unitary rental system. Others have criticised Kemeny's classification for being too coarse, outdated or underspecified (Blessing 2016; Stephens 2020). Recently, research has refocused on differentiating countries based on configurations of particular policies. Yet, while the dichotomous model is rather crude, especially when considering the range of European countries, it does serve as a useful theoretical orientation for understanding the institutional complexities of housing for unequal outcomes in housing conditions, and can be extended to test the theory with policy-specific indicators.

Kemeny's (2001, 2006) distinction of housing systems is based on countries' degree of intervention in rent and ownership markets, and the provision of social housing, which affect the way housing is distributed and at what cost for individuals and families. The categorisation in dual and unitary rental systems implies that the tenure structure is a defining element of the housing system. Although the distribution of dwelling types, such as apartment buildings or detached houses, also differs across housing systems, they do not constitute an institutional dimension of the housing system (Kemeny 2001). Rather, dual rental systems are described to feature a state-regulated segment of the rental market and an unregulated private rental segment alongside state support for homeownership. The sheltered state-regulated segment is said to allocate public social housing on the basis of needs and does not compete with for-profit markets. Housing is often provided for

free or at reduced cost. The private rental segment in dual rental systems is relatively small and operates as a free market. Ultimately, the dominant tenure in dual rental systems is home ownership. The organisation of housing systems with a unitary rental market is described to follow a different logic. Here, state-provided housing is extensive but competes with private rental provision in a unitary market. Rent regulation is often in place, which forces private landlords to lower rent levels to remain competitive with the non-profit sector. The unitary rental system aims to balance rent prices and housing quality between for-profit and non-profit housing, and regulate both. Housing systems with unitary rental markets do not provide particular support to home ownership as in the dual system, and so ownership is less common in unitary than in dual rental systems.

Recent literature highlights the limits of the dichotomous perspective of housing systems that was based on the situation in the 1990s, and has instead implemented a stronger focus on particular policies. The dichotomous perspective has been criticised particularly with respect to housing systems' alignment with the welfare-market nexus. Stephens (2020) finds that the dichotomous model fails to capture housing systems' differential ability to cushion negative effects of developments in housing markets, such as the financialization trend of the past three decades. In fact, the rental markets in some countries with unitary rental systems have managed better (Germany) to compete with home ownership than others (Sweden) (Stephens 2020). Housing policies intervene in these links (Dewilde 2017), indicating that housing systems can be usefully differentiated by the regulation of the rental market, the generosity of housing benefits, and housing market financialization (Dewilde 2021). These policy indicators range from those specifically focused on low-income risk groups such as (many) single mothers, to measures that relate to the housing market more generally. Housing benefits can support in particular low-income risk groups, and tend to be higher in countries with larger rental sectors – that is, in unitary markets (Bradley 2014). Regulation of the *private* rental market, typically stricter in unitary rental market systems, may open up more opportunities for affordable housing of adequate quality for single mothers.

Given the complexity of housing systems, policies, and tenure types, it is important to examine their association with housing conditions across various dimensions. One important and commonly examined housing condition is housing deprivation, which captures the physical standard of the dwelling according to the EU definition (Eurostat 2014). Borg's

(2015) analysis shows that unitary rental systems (indicated by high shares of renting) are associated with overall lower housing deprivation than dual rental systems (indicated by high rates of home ownership). Housing systems and housing policies may be evaluated differently, if other housing outcomes are considered, such as affordability or neighbourhood problems. For low-income households, dual rental systems provide a sheltered market segment with free or reduced rate housing, and hence affordability may overall be less of a problem than in unitary systems. This remains to be tested, however, as rent-setting practices vary across countries, and for instance in the United Kingdom 'affordable rents' can refer to rents that are only marginally below market rates (Williams and Whitehead 2015). In unitary systems, housing prices mostly result from competing private and public providers, catering more for middle-income groups (Dewilde 2017). Here, low-income households can therefore be expected to face a higher housing cost burden in terms of the share of the costs for housing in their total household budget (Dewilde 2018; Quigley and Raphael 2004). However, there is also some evidence counter to the common perception that, in the dual rental system, low-income households mostly live in social housing. In England, for instance, poor households are equally likely among private tenants and social housing tenants (Kemp 2011). Further, disaggregating the housing systems into separately measured dimensions, Dewilde (2021) finds that stronger regulation of the private rental market is associated with lower risks of housing deprivation for all renters, but particularly for those with low incomes. Similarly, housing benefits were also found associated with lower risks of housing deprivation (Dewilde 2021).

In summary, several conclusions can be drawn from the literature on how housing market structures and policies shape housing conditions for social risk groups such as single mothers. First, the literature shows that low-income households have overall better access to affordable housing in dual rental systems due to the sheltered sectors with reduced rent or free social housing (Dewilde 2017, 2021). However, there seems to be a trade-off in terms of housing quality. Competition between for-profit and non-profit providers in the unitary system seems to result in overall better-quality housing and lower housing deprivation for tenants, including those with lower incomes. This is also because, although home ownership may be more common among low-income households in dual systems than in unitary systems, it will be economically less possible to maintain a high quality of their homes. Second,

beyond the dichotomy of rental systems, housing policies such as rental market regulations and housing benefits seem to be important for (a) housing conditions of different households, and for (b) different types of housing conditions. For example, housing benefits or social housing may be targeted at specific groups in different countries. And rental market regulation might matter more for outcomes such as cost overburden than say for the quality of the neighbourhood. Third, changes in housing systems may have diverging implications for housing conditions of different types of households. For instance, high housing prices induced by financialization of housing markets would seem to hit low-income households hardest in terms of housing quality, cost overburden, and the neighbourhoods they can afford to live in.

Family structure and housing outcomes

Comparative housing research remains relatively silent about the housing conditions of different subgroups of the population (apart from low-income households, as discussed above). A separate, emerging research field joining family demography and housing research has however provided a more disaggregated perspective by revealing the close links between family structure and housing outcomes. In light of our research questions on the housing conditions of single mothers, studies on the consequences of union dissolution on residential mobility are particularly instructive. Certainly, union dissolution is only one of the various pathways into single motherhood, and so this research gives useful but partial insights.

This literature shows that, in general, separation causes relocation, and adaptation moves are likely to follow after the first move (Feijten and van Ham 2007; Gram-Hanssen and Bech-Danielsen 2008; Mikolai and Kulu 2018). Further, such moves following separation or divorce are usually urgent and financially restricted (Feijten and van Ham 2007). In these circumstances, individuals often move to temporary accommodation, smaller dwellings, and dwellings of lower financial value or of lower quality (Mikolai and Kulu 2018, 84). That also means such moves may end up in an undesired residential area, because of limited search time and overall lower rents in those areas.

As for tenure types, studies found that single mothers are less likely than other household types to be home owners. This is in part because of their higher poverty risks, but also because owners are less likely to separate and because separated home-owning women are less likely to

remain owners than those who have a new partner (Lersch and Vidal 2014). Some studies in this strand of the literature take a comparative perspective. For example, Thomas and Mulder (2016) find that the ownership gap between married couples and other household types is particularly large in Germany (compared to the UK and the Netherlands). In addition, Dewilde (2008) shows that negative effects of union dissolution on average ownership rates are stronger in Germany than in the UK. These findings point to a strong role of the institutional setting on the association between household structure and tenure type. Germany's housing system with a unitary rental market and relatively strong regulation of the private rental market seems to provide less support to single mothers to continue living in their own home than housing systems with lower regulation. However, in their study of divorce and home ownership in Germany and the UK, Lersch and Vidal (2014) show that the effects of individual characteristics outweigh the effects of institutional characteristics on post-separation housing. This literature does not address implications of single mothers' higher barriers to home ownership for their housing conditions.

In summary, research both on family structure and on housing conditions provides strong indications for expecting lower-quality housing conditions to be common among single mothers. Yet, it is less clear how these associations vary across European countries, and thus to what extent institutional factors regarding the housing market matter. To the extent that findings on the housing conditions of low-income households across institutional contexts apply to vulnerable groups in general, it is to be expected that single mothers benefit from stronger regulation of the rental market in terms of housing quality and lower neighbourhood problems. The provision of housing for free or reduced costs, or of housing benefits should reduce their risks of experiencing housing cost overburden. Financialization resulting in high housing prices, on the other hand, should increase this risk for single mothers, as well as the pressure to move out to less desired neighbourhoods.

Our general hypothesis is that both structural and policy aspects of housing systems are associated with the housing conditions of single mothers in Europe. With respect to structural factors, we expect that high home ownership rates – representing dual rental markets – are associated with worse housing conditions among single mothers. In terms of specific housing policies, we expect rental market regulation and higher housing benefits to be associated with better housing conditions for single mothers, whereas high housing prices are associated

with worse housing conditions for single mothers. Given the discussion above (see section 'Housing systems and inequalities in housing conditions'), there are indications that specific policies and structural conditions may matter more for some housing conditions than others – the extent to which this is the case remains to be tested empirically.

Data & methods

Our analyses are based on the cross-sectional European Union Statistics on Income and Living Conditions (EU-SILC).[1] The EU-SILC data provide a range of indicators on housing conditions, family characteristics and socio-economic background of both individuals and their households, across European countries. We used pooled cross-sectional data from 21 European countries,[2] covering a total of 195 country-years over the period between 2008 and 2017.

The analytical sample was restricted to all prime working-age single mothers (ages 20–55). Single mothers were defined as those who live with one or more of their dependent children but without a partner in a household. Dependent children in EU-SILC are defined as all children younger than 18, and those between the ages of 18 and 24 if they are economically inactive (e.g. students). Single parent households include multi-generational households (e.g. with grandparents living with a single mother) or households in which other adults live (e.g. a sibling of the single parent), as long as the single mother is considered the head of the household and does not co-reside with a partner.

EU-SILC is based on a rotating design, in which the sample is 'refreshed' in four rotations. Individuals in each rotational group are then interviewed up to four times, but EU-SILC provides no indicator to link individuals across cross-sections. To avoid observing individuals multiple times, we only used data from the first wave of each rotational group, based on a method similar to the one presented by Fusco *et al.* (2021). In total, our sample consisted of 21,937 individuals.

We used four dependent variables to capture housing conditions. Two are based on the EU definition of severe housing deprivation, which entails living in a household that is overcrowded as well as experiences

[1] A replication package with syntax and macro-data is available on the Open Science Framework (DOI: 10.17605/OSF.IO/U8R9K). The data were analysed in Sweden, and do not contain sensitive information for which ethical approval is required in Sweden.

[2] Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland and the United Kingdom.

a form of housing deprivation. We use both overcrowding and housing deprivation as separate indicators, as defined below:

Housing deprivation: This indicator measures whether the home has one or more of the following deficiencies: a leaking roof, no bath/shower, no indoor toilet, or a dwelling considered too dark or unable to keep adequately warm.

Overcrowding: This indicator measures whether the number of rooms in the house is lower than what is considered adequate based on family composition. The required number of rooms is equal to: one room for the household; one room per couple or single head of the household; one room for each single person aged 18 or more; one room per pair of single people of the same gender between 12 and 17 years of age; one room for each single person between 12 and 17 years of age and not included in the previous category; and one room per pair of children under 12 years of age.

Cost overburden: Indicates whether an individual lives in a household that spends more than 40% of their disposable household income on housing costs (after any housing benefits were deducted).

Neighbourhood problem: Subjective indicator whether an individual reports living in a neighbourhood where they experience one or more of the following (a.) noise from the neighbours or from the street, (b.) pollution, grime or other environmental problems, or (c.) crime or vandalism in the area.

At the individual level, we define the following independent variable of key importance:

Tenure status: Differentiates between owner-occupied (reference category), tenant, tenant at a reduced rate, and living in accommodation that is provided for free.

In addition to these variables of key interest, we adjusted for several socio-demographics in our analyses. These are individuals' level of **education** (low, middle, and high), whether or not they are **employed**, their **age**, the **size of the household**, whether the household is **at-risk-of-poverty** (AROP, defined as an equivalised disposable household income below 60% of the national median), and the degree of **urbanisation** (densely populated, intermediate, and thinly populated). We finally control for **dwelling type**, differentiating between a detached house, a semi-detached house, an apartment (in a building with fewer than 10 apartments), and an apartment in a large building (of 10 or more apartments).

Finally, five contextual variables were analysed. All were measured at the level of the country-year, and are thus time-varying:

Home ownership rate: This variable is aggregated from the micro-data, and represents the percentage of people who live in a home they own outright. This is a commonly used measure to proxy the degree to which the housing market is dualised (Borg 2015; Dewilde and Decker 2016).

Rental market regulation: Indicated by the Rental Market Regulation Index (Remain index) that covers a wide range of indicators of rent controls, tenant protection security and housing rationing (Kholodilin *et al.* 2018)

Housing Benefits: For measuring housing benefits, newly created indicators were created using the OECD tax-benefits module (for more details see Nelson *et al.* 2022). We estimated the amount of housing benefits for an ideal-typical single-mother household (with 2 children). Rent-levels were determined on average rents (for this household type) in EU-SILC. Housing benefits were calculated for this single-mother household, assuming her wage was at different percentage of average wage, ranging in 5-point increments from 5% of average wage to 200% of average wage. Then, the average housing benefits received at each of these wage-levels was calculated, and expressed as a replacement rate (as a percentage of average rent). This procedure is commonly applied to create social-rights based indicators of social benefits that are suitable for comparative research (Nelson *et al.* 2020).

Housing prices: These were measured as the house-price-to-income ratio (obtained from OECD.stat), which for comparability is expressed as an index (for all countries the values were standardised to 100 in 2015), so this indicator only measures changes in housing prices over time.

GDP per capita: Because cross-national variations in housing conditions are to a large extent determined by the overall wealth of a country, it is common in housing studies to control for GDP per capita. We obtained real GDP per capita (in Euro) from Eurostat (table SDG_08_10).

Table 1 presents weighted descriptive statistics of all of the variables. Note that the four dependent variables are binary, but were multiplied by 100 so that the interpretation of the regression parameters is in percentage-points. The contextual variables were standardised (to a mean of 0 and standard deviation of 1) for ease of interpretation.

Table 2 presents descriptive statistics for the four main contextual variables, providing unstandardised scores. Per country, and for each of the four variables, the mean score gives a sense of the cross-country variation, whereas the first and last observed scores give a sense of the change within a country over time. As there is substantial variation both within and across countries, these will be separated from each other in the analyses.

Table 1. Descriptive statistics (weighted).

	Overall (N = 21937)
Housing deprivation	
Mean (SD)	34.8 (47.6)
Range	0 - 100
Overcrowded	
Mean (SD)	25.1 (43.4)
Range	0 - 100
Cost Overburden	
Mean (SD)	21.7 (41.2)
Range	0 - 100
Neighbourhood Problems	
Mean (SD)	36.9 (48)
Range	0 - 100
Tenure Status	
1. Owner	10122 (47.0%)
2. Tenant	6537 (30.3%)
3. Tenant reduced rate	3689 (17.1%)
4. Free	1209 (5.6%)
Dwelling Type	
1. Detached	3793 (17.6%)
2. Semi-detached	5789 (26.9%)
3. Apartment	4124 (19.1%)
4. Apartment in large building	7850 (36.4%)
Level of Education	
1. Low	4645 (21.5%)
2. Middle	10167 (47.2%)
3. High	6745 (31.3%)
Household Size	
Mean (SD)	2.6 (0.8)
Range	2 - 10
Employment	
Not employed	6844 (31.8%)
Employed	14712 (68.2%)
Age	
Mean (SD)	39.2 (8.5)
Range	20 - 55
Degree of Urbanisation	
1. Dense	10664 (49.5%)
2. Intermediate	5219 (24.2%)
3. Thinly populated	5673 (26.3%)
At-Risk-Of-Poverty (AROP)	
Mean (SD)	0.3 (0.5)
Range	0 - 1
Home Ownership Rate	
Mean (SD)	0.1 (1.1)
Range	−2.9 - 2.5
Real GDP per Capita	
Mean (SD)	0.0 (1.0)
Range	−2.3 - 2.1
Housing Benefits	
Mean (SD)	0.0 (1.0)
Range	−1.03 - 1.9
Housing prices (index)	
Mean (SD)	−0.0 (1.0)
Range	−2.2 - 5.3
Real GDP per Capita	
Mean (SD)	0.0 (1.1)
Range	−1.5 - 3.0

Table 2. Descriptive statistics of four contextual variables: home ownership, rental market regulation, housing prices and housing benefits (unstandardised scores) – Per country, columns represent the mean score, the first observed score, and the most recent.

	Home ownership			Rental market regulation			Housing prices			Housing benefits		
	Mean	First	Last	Mean	First	Last	Mean	First	Last	Mean	First	Last
Austria	0.6	0.6	0.5	0.5	0.5	0.5	91.0	73.0	107.9	11.8	8.9	12.6
Belgium	0.7	0.7	0.7	0.2	0.2	0.2	98.9	95.0	100.2	0.0	0.0	0.0
Denmark	0.6	0.7	0.6	0.6	0.7	0.5	101.2	122.2	102.6	17.3	16.6	18.0
Estonia	0.8	0.9	0.8	0.5	0.5	0.5	93.1	83.4	95.9	8.6	4.8	7.4
Finland	0.7	0.7	0.7	0.2	0.2	0.2	101.3	101.7	98.9	24.0	22.6	27.4
France	0.6	0.6	0.6	0.6	0.6	0.7	103.4	108.0	100.4	21.6	21.2	22.5
Germany	0.5	0.5	0.5	0.4	0.4	0.4	94.6	93.3	97.3	10.0	9.1	10.6
Greece	0.8	0.8	0.7	0.0	0.0	0.0	111.0	117.1	96.6	4.6	19.4	0.0
Ireland	0.7	0.8	0.7	0.3	0.3	0.3	101.7	136.3	108.6	0.9	0.0	8.8
Italy	0.7	0.7	0.7	0.6	0.6	0.6	110.6	119.4	95.5	0.3	0.3	0.2
Latvia	0.8	0.9	0.8	0.3	0.3	0.3	112.0	150.5	103.7	4.1	1.5	0.9
Lithuania	0.9	0.9	0.9	0.2	0.2	0.2	108.5	159.1	99.4	0.0	0.0	0.0
Luxembourg	0.7	0.7	0.7	0.6	0.6	0.6	95.3	84.9	106.9	4.5	4.4	5.8
Norway	0.8	0.9	0.8	0.5	0.5	0.5	99.2	94.5	106.4	20.9	19.8	22.2
Poland	0.8	0.7	0.8	0.4	0.4	0.4	114.2	153.8	95.3	6.8	5.7	4.8
Portugal	0.7	0.7	0.7	0.4	0.6	0.3	103.4	107.6	109.4	0.0	0.0	0.0
Romania	1.0	1.0	1.0	0.3	0.3	0.3	120.2	173.6	89.2	0.0	0.0	0.0
Spain	0.8	0.8	0.8	0.7	0.7	0.7	115.7	144.2	105.2	0.0	0.0	0.0
Sweden	0.7	0.7	0.7	0.6	0.8	0.5	92.7	82.2	109.3	20.0	19.3	20.8
Switzerland	0.4	0.4	0.4	0.4	0.4	0.4	93.6	81.8	104.0	13.6	9.9	17.1
United Kingdom	0.7	0.7	0.6	0.2	0.2	0.2	98.5	106.8	99.5	26.2	30.3	28.0

Analyses

We begin the analyses with descriptive bi-variate associations between the four outcome variables on the housing situation of single mothers on the one hand, and the degree of rental market regulation, housing benefits and housing prices on the other. Next, we present three sets of linear probability regression models. Linear probability models have the advantage that parameters can be compared across models, which cannot be done with logit models (Breen *et al.* 2018). All models are multilevel models with individuals nested within both country-year and country – the latter accounting for unobserved (time-invariant) heterogeneity between countries (Bell *et al.* 2019). These models also account for the fact that not all countries were observed for the exact same number of years. Intercepts are random at the levels of country-year and country. Household-level sampling weights were used throughout the analyses. As we have directional hypotheses, we present a one-tailed test of significance (at 5%) along with stricter two-tailed tests at the 5% and 1% level.

The first set of models examines how the four indicators of single mothers' living conditions are associated with their socio-demographic situation, tenure status, and a number of housing-related controls such as dwelling type and degree of urbanisation. The second set of models controls for these, and adds the contextual variables. Informed by the variation in the contextual variables both between and within countries observed in Table 2, the third set of models further differentiates the contextual effects to variation in contextual conditions *between* countries, and change over time *within* countries. This is done for all contextual variables, except for the housing prices index as the standardisation of that variable makes the between-country effect meaningless.

Results

Figure 1 presents the prevalence of single mothers experiencing housing deprivation, overcrowding, cost overburden and neighbourhood problems. The bars present the averages by country (with 95% confidence intervals), thus pooling multiple years, and in each panel the countries are sorted based on the likelihood of experiencing housing deprivation. These descriptive results allow for two broad observations. First, the results indicate that, at least with respect to single mothers, low-quality housing conditions are multidimensional as there is (at best) a weak

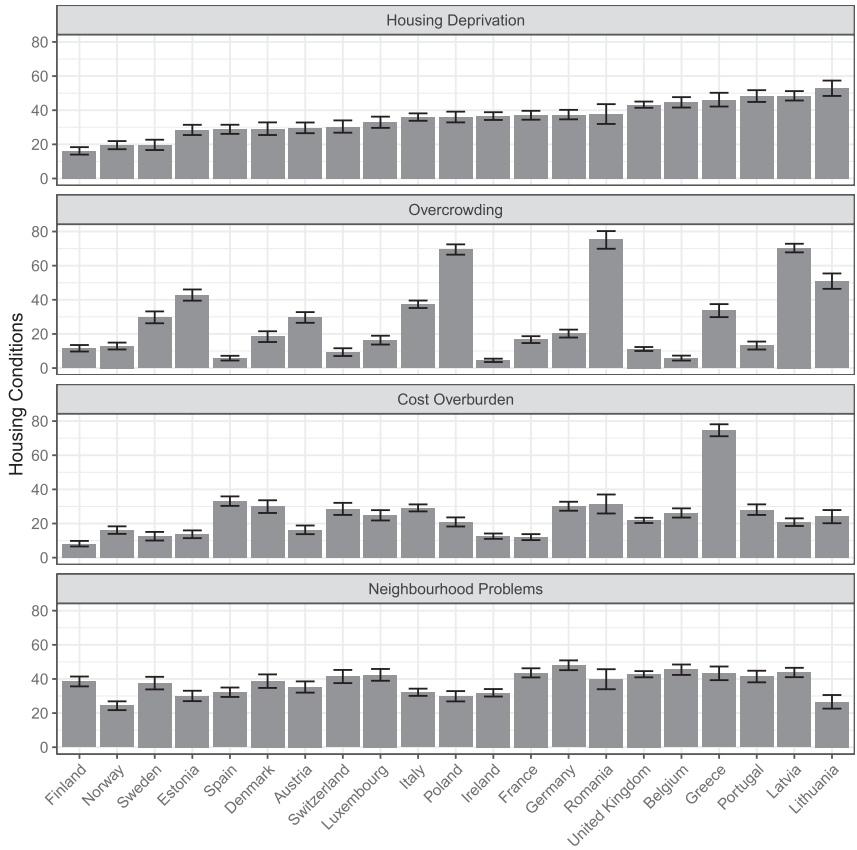

Figure 1. Likelihood that single mothers experience housing deprivation, overcrowding, cost overburden and neighbourhood problems, by country (all years pooled per country). Note: The Error-bars indicate the 95% confidence interval.

correlation between the different housing conditions across countries. For instance, Central and Eastern European countries tend to have high rates of overcrowding, but in terms of housing deprivation their rates range from relatively high (Latvia and Lithuania), to medium (Poland and Romania), and even to low (Estonia). This potentially means that different housing conditions are affected differently by institutional factors of the housing system. Therefore, in the remainder of the analyses we continue to analyse housing conditions separately. Secondly, there is more variation than would be suggested by the ideal-typical distinction between unitary and dual housing systems. For instance, the Nordic countries show low rates of housing deprivation, even though the Swedish housing market is typically considered as unitary, whereas Norway is classified as having a dual housing market.

Figure 2 presents descriptive associations between different combinations of contextual variables (horizontal axes) and housing conditions (vertical axes). Each dot represents a single country-year, indicating the percentage of single mothers experiencing the respective housing condition. The red lines represent the linear OLS associations (with 95% confidence interval). The labels on the top and right-hand side of the figure indicate which bivariate association is shown in each panel. Looking at the first row, it is shown how higher housing benefits are

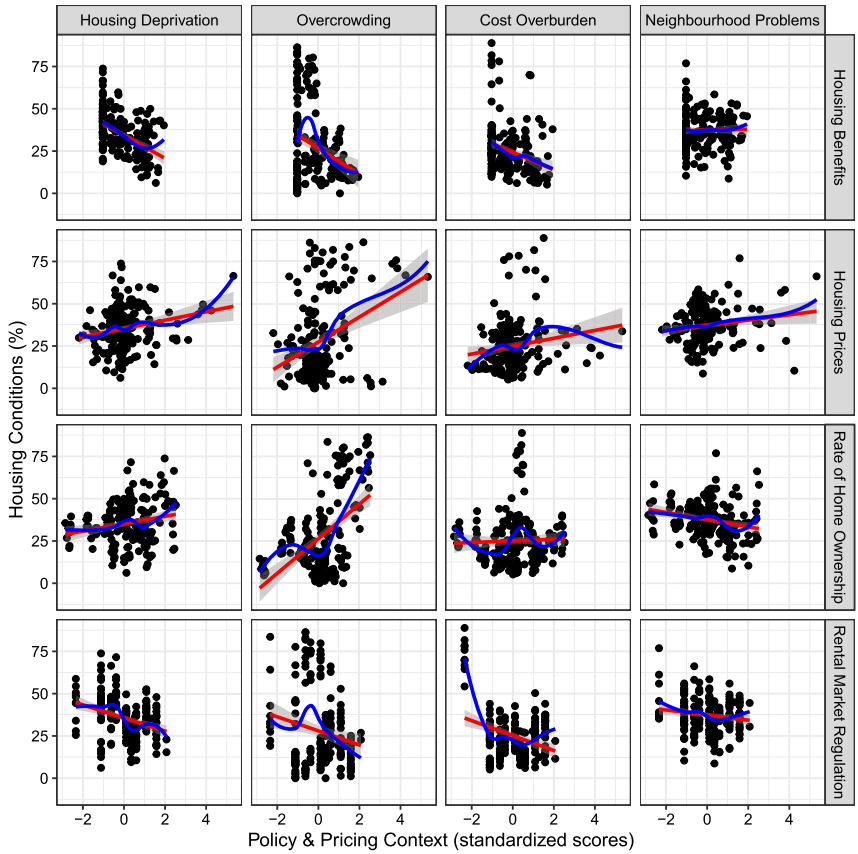

Figure 2. Bivariate associations between different combinations of contextual variables (horizontal axes) and housing conditions (vertical axes). Note: Each dot equals one country-year, for which the housing conditions were aggregated to a percentage. The contextual variables on the horizontal axes were standardised: a value of 0 represents the average contextual condition across countries and years, and each point above/below indicates one standard deviation above/below that average. Red (straight) line indicates linear OLS association (with 95% confidence interval), and blue (curved) lines are based on locally estimated scatterplot smoothing (LOESS).

associated with fewer single mothers experiencing housing deprivation, overcrowding and being cost overburdened. Next, higher housing prices are associated with higher risks of housing deprivation, overcrowding, cost overburden and more single mothers experiencing neighbourhood problems. A higher rate of home ownership is associated with higher risks of housing deprivation and (especially) overcrowding and somewhat lower rates of neighbourhood problems. Stricter rental market regulation, finally, is associated with lower risks of housing deprivation, overcrowding, cost overburden and to a lesser degree with neighbourhood problems. The blue (curved) lines represent locally estimated scatterplot smoothing (LOESS) estimates that allow for non-linearities. In most cases, the linear OLS associations provide a good approximation of the association present in the data, with the exception of the association between rental market regulation and cost overburden. This non-linearity is mostly driven by a high rate of cost overburden in Greece, which was observed multiple times with the same low level of rental market regulation. In general, these bivariate associations do not adjust for other variables, do not take into account the nesting structure of the data, and do not separate variation between countries from change within countries. Therefore, we next present a series of multilevel regression models.

In Table 3, the four indicators of housing conditions among single mothers are regressed on a number of individual and household-level factors, and a contextual control for GDP per capita. Each column is a different dependent variable (but with the same independent variables). By and large, the results are as could be expected. Single mothers with higher levels of education, who are employed, living outside densely populated urban areas, in owner-occupied housing, and who are not at-risk-of-poverty tend to experience lower rates of problematic housing conditions. Unexpectedly, higher educated single mothers seem to experience more cost overburden, but that is conditional on the control of being at-risk-of-poverty (when the poverty control is excluded, higher educated single mothers are less cost overburdened because they are less likely to be poor). Single mothers living in apartments are more likely to experience overcrowding and to live in a neighbourhood with problems than those living in a detached house, whereas those living in large apartment buildings additionally experience lower rates of housing deprivation and less cost overburden. GDP per capita plays an important role in shaping housing conditions, and is associated with lower risks for housing deprivation, overcrowding and cost

Table 3. Four housing conditions of single mothers regressed on socio-economic background, tenure and dwelling type, and GDP per capita.

	Housing deprivation		Overcrowding		Cost overburden		Neighbourhood problems	
Predictors	Estimates	std. Error	Estimates	std. Error	Estimates	std. Error	Estimates	std. Error
(Intercept)	29.35 ***	2.91	0.04	4.28	30.91 ***	3.32	29.92 ***	2.69
Education (ref = Low)								
Middle	−7.81 ***	0.84	−4.74 ***	0.67	1.89 ***	0.67	−1.74 **	0.86
High	−12.69 ***	0.95	−9.07 ***	0.76	2.39 ***	0.76	−3.21 ***	0.98
Household Size	1.93 ***	0.40	8.10 ***	0.32	−3.51 ***	0.32	−0.60	0.41
Employed	−6.31 ***	0.75	0.24	0.60	1.14 *	0.59	−3.41 ***	0.76
Age	0.25 ***	0.04	−0.09 ***	0.03	−0.27 ***	0.03	0.15 ***	0.04
Urbanisation (ref = Dense)								
Intermediate	−2.99 ***	0.80	−3.08 ***	0.64	−2.22 ***	0.64	−7.83 ***	0.82
Thinly populated	−1.62 **	0.82	−2.03 ***	0.66	−5.86 ***	0.65	−12.08 ***	0.84
Tenure (ref = Owner)								
Tenant	11.28 ***	0.86	7.87 ***	0.69	16.84 ***	0.68	3.99 ***	0.88
Tenant reduced rate	11.88 ***	1.04	5.28 ***	0.83	−2.90 ***	0.83	12.86 ***	1.06
Free	10.54 ***	1.43	7.37 ***	1.14	−10.03 ***	1.13	3.02 **	1.46
Dwelling (ref = Detached)								
Semi-detached	−1.82 *	1.03	3.35 ***	0.82	−1.97 **	0.82	2.93 ***	1.06
Apartment	−0.21	1.14	15.25 ***	0.91	−1.08	0.90	10.78 ***	1.17
Apartment in large building	−8.41 ***	1.05	18.15 ***	0.84	−2.13 **	0.83	15.65 ***	1.07
At-Risk-of-Poverty	5.80 ***	0.73	4.77 ***	0.58	31.70 ***	0.58	0.90	0.75
GDP per Capita	−5.54 ***	1.51	−9.13 ***	2.86	−5.00 **	2.08	1.06	1.18
Random Effects								
Residual σ^2	2005.03		1275.38		1261.11		2106.69	
Random Intercepts	20.85 $_{\text{Country-year}}$		46.72 $_{\text{Country-year}}$		20.14 $_{\text{Country-year}}$		35.39 $_{\text{Country-year}}$	
	64.06 $_{\text{Country}}$		308.28 $_{\text{Country}}$		158.47 $_{\text{Country}}$		31.36 $_{\text{Country}}$	
ICC	0.04		0.22		0.12		0.03	
N	195 $_{\text{Country-year}}$		195 $_{\text{Country-year}}$		195 $_{\text{Country-year}}$		195 $_{\text{Country-year}}$	
	21 $_{\text{Country}}$		21 $_{\text{Country}}$		21 $_{\text{Country}}$		21 $_{\text{Country}}$	
Observations	21937		21937		21937		21937	
Marginal R^2 / Conditional R^2	0.062 / 0.100		0.138 / 0.325		0.178 / 0.280		0.052 / 0.081	

* $p<0.5$ (one-tailed) ** $p<0.05$ (two-tailed) *** $p<0.01$ (two-tailed).

Table 4. Four housing conditions of single mothers regressed on housing policy, prices, and GDP per capita (all controls from Table 3 included, including GDP per Capita).

	Housing deprivation		Overcrowding		Cost overburden		Neighbourhood problems	
Predictors	Estimates	std. Error	Estimates	std. Error	Estimates	std. Error	Estimates	std. Error
Rental Market Regulation	−2.55 **	1.30	−1.68	1.99	1.17	1.55	−1.32	1.28
Housing Benefits	−3.06 *	1.62	−4.86 *	2.51	−0.69	1.97	−0.21	1.58
Home Ownership	−0.60	1.37	6.46 ***	2.26	1.91	1.75	0.33	1.33
Housing Prices	0.23	0.57	0.75	0.66	−0.18	0.50	2.01 ***	0.64
Random Effects								
Residual σ^2	2004.89		1275.33		1261.16		2106.34	
Random intercepts	21.77 $_{\text{Country-year}}$		44.09 $_{\text{Country-year}}$		19.93 $_{\text{Country-year}}$		33.16 $_{\text{Country-year}}$	
	48.73 $_{\text{Country}}$		278.65 $_{\text{Country}}$		176.73 $_{\text{Country}}$		38.06 $_{\text{Country}}$	
ICC	0.03		0.20		0.13		0.03	
N	195 $_{\text{Country-year}}$		195 $_{\text{Country-year}}$		195 $_{\text{Country-year}}$		195 $_{\text{Country-year}}$	
	21 $_{\text{Country}}$		21 $_{\text{Country}}$		21 $_{\text{Country}}$		21 $_{\text{Country}}$	
Observations	21937		21937		21937		21937	
Marginal R^2 / Conditional R^2	0.069 / 0.101		0.161 / 0.331		0.176 / 0.287		0.053 / 0.084	

* $p<0.5$ (one-tailed) ** $p<0.05$ (two-tailed) *** $p<0.01$ (two-tailed).

overburden – but is unrelated to single mothers' risk of experiencing neighbourhood problems. Finally, and perhaps most importantly from the comparative perspective on different systems, housing that is provided for free or at a reduced rate is associated with lower rates of cost overburden than home ownership – as would be expected – but also with worse housing conditions related to housing deprivation, overcrowding, and neighbourhood problems.

Next, we turn to the contextual conditions. In Table 4, the four indicators of housing conditions are regressed on the four contextual variables of Figure 2. All individual and household-level controls that were included in Table 3, as well as GDP per capita, are controlled for (but not shown here). By and large, the results show that the country-context in which single mothers live shapes their housing conditions, although (in contrast to our general hypothesis) not all indicators of housing conditions are related to the same contextual conditions. Single mothers' risk of housing deprivation is lower in contexts with stricter rental market regulation, and with higher housing benefits. Overcrowding, on the other hand, is less common in countries with higher housing benefits, yet it is higher when home ownership is more common. In Table 3 it was already reported that home-owning single mothers are less likely to experience overcrowding. As the results reported here are controlled for individual home ownership, the additional (contextual) effect of home ownership rates is to be interpreted in structural terms: in countries where home ownership is the predominant mode of tenure, housing for single mothers (as a risk group in the housing market) tends to be smaller and more likely to be overcrowded irrespective of their tenure situation. Next, the risk of being cost overburdened is not related to the contextual conditions here, and single mothers are more likely to report neighbourhood problems in societies where housing prices are high. This could indicate that single mothers in these countries can only find housing in particular neighbourhoods, in which the last remaining low-cost housing is concentrated. The potential outliers in the association between rental market regulation and cost overburden (as observed in Figure 2) are accounted for by the multilevel model, and here no association is to be reported.

Finally, in Table 5, we differentiate between variation between countries and within countries regarding the contextual variables (with the exception of housing prices, which was measured in a way that only captures within-country variation). In a number of cases this allows for a more precise estimation of the associations. In Table 4,

Table 5. Four housing conditions of single mothers regressed on housing policy, prices, and GDP per capita, differentiating between-country from within-country variation (all controls from Table 3 included, including GDP per Capita).

	Housing deprivation		Overcrowding		Cost overburden		Neighbourhood problems	
Predictors	Estimates	std. Error	Estimates	std. Error	Estimates	std. Error	Estimates	std. Error
Between:								
Rental Market Regulation	−2.89 *	1.69	−0.27	3.96	−5.19 *	2.77	−2.36 *	1.36
Housing Benefits	−4.83 **	2.04	0.00	4.82	−4.09	3.37	−0.36	1.64
Home Ownership Rate	0.77	1.63	8.86 **	3.77	−0.89	2.64	−2.62	1.32
Within:								
Rental Market Regulation	−0.83	2.05	−2.20	2.39	3.31	1.84	−1.40	2.28
Housing Benefits	0.75	2.51	−6.56 **	2.92	0.22	2.27	−2.09	2.78
Home Ownership Rate	−5.25	2.41	5.81 **	2.88	2.59	2.19	11.34 ***	2.70
Housing Prices	0.05	0.56	0.81	0.66	−0.17	0.51	2.16 ***	0.62
Random Effects								
Residual σ^2	2005.20		1275.34		1261.19		2106.32	
Random intercepts	19.56 $_{\text{Country-year}}$		44.25 $_{\text{Country-year}}$		19.75 $_{\text{Country-year}}$		28.43 $_{\text{Country-year}}$	
	47.81 $_{\text{Country}}$		288.91 $_{\text{Country}}$		140.36 $_{\text{Country}}$		27.85 $_{\text{Country}}$	
ICC	0.03		0.21		0.11		0.03	
N	195 $_{\text{Country-year}}$		195 $_{\text{Country-year}}$		195 $_{\text{Country-year}}$		195 $_{\text{Country-year}}$	
	21 $_{\text{Country}}$		21 $_{\text{Country}}$		21 $_{\text{Country}}$		21 $_{\text{Country}}$	
Observations	21937		21937		21937		21937	
Marginal R^2 / Conditional R^2	0.073 / 0.104		0.151 / 0.327		0.194 / 0.285		0.061 / 0.085	

* $p<0.5$ (one-tailed) ** $p<0.05$ (two-tailed) *** $p<0.01$ (two-tailed).

rental market regulation was found only to be associated with lower rates of housing deprivation, but when the variation between countries is separated from the changes within countries, the results show that fewer single mothers report cost overburden and neighbourhood problems in countries that had stricter rental market regulation throughout (only significant when tested one-tailed). Table 5 further shows that housing benefits are associated with lower rates of housing deprivation between countries, whereas increases in housing benefits (within countries) are associated with reduced risks of overcrowding. The association between home ownership rates and higher overcrowding appears both between countries and within countries overtime. In these models, an increase in home ownership rates is associated with more single mothers reporting neighbourhood problems. The association between housing prices and neighbourhood problems remains substantively similar as in the models reported in Table 4.

It should finally be noted that no Bonferroni correction (for multiple hypothesis testing) was applied, as these increase the risk for false negatives. However, particularly given the large number of tests, it should be emphasised that a number of associations were statistically significant at the one-tailed 5% level. In the broader interpretation of our findings in the discussion section that follows, we only focus on the estimates that have more precision (two-tailed significance at least at 5%). Furthermore, it should be emphasised the association between rental market regulation and costs overburden and neighbourhood problems is driven by the situation in Greece – and that removal of Greece from the data renders these associations statistically insignificant. Nonetheless, exceptionally higher rates of cost overburden in Greece have been reported over a longer period of time (OECD 2020), and have been analysed in relation to (among other factors) a long-term deregulation of the housing market (Siatitsa 2021).

Conclusion

This study provides a first attempt to map single mothers' housing conditions across European countries, also considering the role of different housing contexts including structural aspects and several housing policies. As such, this study bridges different research fields for a more comprehensive view of single mothers' position across Europe. We add to the extensive literature a better understanding of single mothers' socioeconomic position by looking at the often-neglected dimension of

housing; and we follow comparative research that demonstrates the importance of institutional settings to understanding single mothers' living conditions.

We combined insights from comparative housing studies and from family demographic research to derive expectations about the housing conditions of single mothers in different contexts. First, comparative housing studies suggest that housing systems shape the housing conditions of low-income households in characteristic ways. In line with other recent studies on housing (e.g. Dewilde 2021), we expanded on this literature by moving away from analyses solely based on housing systems, and towards the inclusion of specific policy indicators. Second, family demographic research examining the links between family structures and housing outcomes points to particular vulnerabilities of single mothers. Yet, the findings presented here show systematic differences between single mothers living in different country contexts.

Our empirical analyses explored the associations between on the one hand home ownership rates, rental market regulation, housing benefits, and housing prices, and on the other hand several housing conditions: housing deprivation, overcrowding, housing cost overburden and neighbourhood problems. Our descriptive evidence demonstrated that these housing problems are common among single mothers in a large number of European societies. At the individual level, living in free housing or housing at reduced rents helped reduce housing cost overburden for single mothers, but was also associated with higher rates of housing deprivation, overcrowding and neighbourhood problems. This trade-off is consistent with earlier theorising (Kemeny 2001, 2006) around how low-price housing for specific low-income risk groups often comes at the expense of the quality of that housing.

Regarding the contextual level, our findings demonstrate that the housing systems of European countries differ in more than the extent to which specific types of housing are reserved for risk groups. Over and above cross-national variation in the socio-demographic background, dwelling types and tenure status of single mothers, structural factors and policies were shown to matter for housing conditions. Even though GDP per capita (as a proxy for a country's wealth) is an important element in shaping housing conditions, factors that are within the control of policy makers – rental market regulation and housing benefits – were shown to benefit the housing conditions for single mothers.

There is evidence that some housing conditions vary systematically with housing policies between countries (e.g. housing deprivation with

housing benefits), whereas others vary within countries over time (e.g. overcrowding with housing benefits and home ownership rates, or living in a bad neighbourhood with housing prices and home ownership rates). In particular the latter shows the complexity of housing markets: even though single mothers who own their own home are less likely to report neighbourhood problems, an increase in home ownership rates was associated with more neighbourhood problems as reported by single mothers. Taken together, this can be interpreted as indicating that housing policies – and structural aspects of the housing market as captured by home ownership rates – work in different ways: either affecting the quality of the housing stock in a country, or affecting how likely it is that specific risk groups such as single mothers end up in less desirable housing conditions. It is, however, beyond the scope of this study to differentiate and *test* these mechanisms, as it would need to cover a longer time-period of data – and ideally allow for following individuals along their housing transitions. This is left for future research. Nonetheless, these findings do underline the importance of the fairly recent move in the housing literature to use actual policy indicators that can vary between and within countries, rather than using typologies that are notoriously static.

In summary, the findings reported here point to the structural nature of the situation of single mothers. Furthermore, that these findings held up while controlling for single mothers' elevated income poverty risks, suggests that the housing situation of single mothers is – at least in part – subject to different institutional dynamics rather than income distribution alone. The insights from our study can inform discussions about regulating housing systems in two respects, related to the trade-offs in, and multidimensionality of, the housing situation of single mothers. First, the provision of free housing can reduce financial stress for socioeconomically vulnerable households such as single mother families, but there is a risk of trading-off quality of the accessible housing. That means, quality of social housing should be a policy focus as well. Second, lack of housing benefits was not linked to higher housing cost overburden but instead to single mothers having to opt for housing that is too small for themselves and their family, whereas structural factors driving up housing prices seem to push single mothers into areas of the housing market with higher likelihood of perceived neighbourhood problems.

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