

# Under-occupancy and fuel poverty in Scotland

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## Introduction

This discussion paper considers the under-occupancy of homes as a poorly understood concept that may hold great potential for helping inform our understanding of how fuel poverty is experienced and can be tackled in Scotland. Under the Scottish definition of fuel poverty under-occupancy occurs when a dwelling exceeds the bedroom standard of its occupants by two or more rooms. However official estimates of fuel poverty assume that all under-occupied rooms are heated to the same standards as the main bedroom.

It is estimated that of those who are living in fuel poverty and are on low incomes around 89,000 households (24%) are living in homes with two or more bedrooms under-occupied; and under-occupation almost doubles (46%) for those 204,000 households that are fuel poor, but not income poor. Official estimates of the fuel costs required to maintain an adequate heating regime in some homes may be increased because of under-occupancy. Consequently, Scottish fuel poverty figures could be unfairly inflated where the underpinning assumptions are not consistent with actual household behaviour.

This paper is structured as follows. It begins by defining more fully what we mean by under-occupancy before examining evidence that considers under-occupancy within the Scottish fuel poverty context. The paper then looks at different options on what can be done about under-occupancy and why it remains problematic from a policy point of view. The final concluding section includes several key recommendations that may help overcome many of the difficulties identified.

## Defining under-occupancy

The Scottish House Condition Survey (SHCS) is Scotland's national housing survey.<sup>1</sup> The SHCS defines households as living in overcrowded or under-occupied conditions with reference to the UK Housing (Overcrowding) Bill 2003.<sup>2</sup> This considers the number of bedrooms available in the dwelling and the type of household that occupies it. Notably this is different from the criteria for the removal of what has become known as the spare room subsidy. Full detail on the bedroom standard and the differences between it and the bedroom subsidy is discussed in the SHCS key findings report.

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<sup>1</sup> <https://www.gov.scot/collections/scottish-house-condition-survey/>

<sup>2</sup> <https://publications.parliament.uk/pa/cm200203/cmbills/046/03046.i-5.html#i002>

In October 2016 the report of the Scottish Fuel Poverty Strategic Working Group (SWG) included a recommendation that a review of the definition of fuel poverty being used in Scotland be commissioned.<sup>3</sup> This was based on a general concern that the fuel poverty definition might be too broad and therefore make difficult the targeting of assistance towards those in most need. The Scottish Government accepted the recommendation and in 2017 established a panel of four independent academics to:

- conduct a review of the definition of fuel poverty being used in Scotland;
- make recommendations for whether the definition should be retained; and
- indicate any changes – if required – that should be made.

The review panel comprised Glen Bramley (Professor of Urban Studies at Heriot-Watt University), Suzanne Fitzpatrick (Professor of Housing & Social Policy at Heriot-Watt University), Christine Liddell (Emeritus Professor of Psychology at Ulster University), and Janette Webb (Professor of Sociology at University of Edinburgh).

The panel's report comprised a section on fuel poverty and under-occupancy that took as its starting position the fact that under-occupancy occurs under the Scottish definition of fuel poverty when a home exceeds the bedroom standard of its occupants by two or more rooms.<sup>4</sup> Scottish estimates of fuel poverty assume that all under-occupied rooms are heated to the same standards as the main bedroom (18°C). This has the potential to increase estimates of the fuel costs required to maintain an adequate heating regime, which could be unfairly inflated where the underpinning assumptions are not consistent with actual household behaviour.

Included in the panel's report was analysis published by the Scottish Government in 2012 that showed the method for estimating the prevalence of fuel poverty justifies higher temperatures in rooms that are unoccupied because "... it is considered that creating cold-spots is detrimental to the physical structure of the dwelling" (p.68).<sup>5</sup> In many cases the under-heating of rooms which are not used every day can lead to the development of damp, mildew, and mould in the fabric of the building: on walls, wooden beams, floorboards, and most other surfaces.

These harms have also been associated with poorer respiratory health therefore, as noted by the panel, they are firmly related to fuel poverty. As acknowledged by Thompson et al. (2013),

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<sup>3</sup> <https://webarchive.nrscotland.gov.uk/20210415134522/www.gov.scot/groups/fuel-poverty-strategic-working-group>

<sup>4</sup> <https://www.gov.scot/binaries/content/documents/govscot/publications/independent-report/2017/11/new-definition-fuel-poverty-scotland-review-recent-evidence/documents/00527017-pdf/00527017-pdf/govscot%3Adocument/00527017.pdf>

<sup>5</sup>

<https://www.webarchive.org.uk/wayback/archive/3000/https://www.gov.scot/Resource/0039/00398798.pdf>

the under-heating of rooms which are not used every day can not only lead to negative impacts for the fabric of the dwelling but also the health of the people living in those properties.<sup>6</sup> In addition, rooms that are inadequately heated can also lead to householders closing off parts of their home during colder months, leading to them experiencing what the review panel described as “spatial shrink and reduced mobility” (p.68). By adapting how fuel poor households are living in cold homes can have adverse effects on both physical health and mental wellbeing.

When it comes to under-occupancy the panel asserted there was little evidence to challenge the earlier decision fix indoor heating regimes in Scotland. As a result they concluded that official guidance that all areas of the home should be heated in a relatively even manner – even in colder months – should continue. In this way, there would be an opportunity to protect the dwelling from avoidable deterioration as well as the experience of the individual members of the household living in the home. However there is an obvious tension between this official viewpoint and the practical advice provided to households by energy stakeholders, including advice and advocacy services, such as Home Energy Scotland and Energy Action Scotland, amongst others. This advice often includes simple suggestions about how to reduce energy use and cost along with everyday coping mechanisms such as turning down thermostats and turning off heating in rooms not in use.

The review panel acknowledged research by Beizae et al. (2015) that suggested this kind of “zonal heating” approach may be least beneficial for households who are at home most of the time and most beneficial for households who are at work or school during the day.<sup>7</sup> However, energy stakeholders have pointed out there are potentially substantial savings to be derived from using zonal controls in appropriate conditions. The review panel suggested this is an area where further work is needed across the policy domains of domestic energy efficiency and public health.

### Under-occupancy in Scotland

The SHCS key findings report presents under-occupancy data as the proportion of households:

- meeting the minimum requirements of the bedroom standard;
- those with one bedroom in excess of minimum requirements, and
- those with two or more bedrooms in excess of the minimum requirements.

In 2019 it was estimated that around 918,000 (37%) households had one additional bedroom above the minimum of the bedroom standard and 812,000 (33%) households had two or

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<sup>6</sup> <https://pubmed.ncbi.nlm.nih.gov/23450585/>

<sup>7</sup> <https://www.sciencedirect.com/science/article/pii/S037877881500047X>

more bedrooms more than the minimum standard. Several differences are apparent in the survey across various household characteristics:

- **Housing tenure** – Households in the social and private rented sectors are more likely to be living in homes that meet the minimum requirements of the bedroom standard (social 53%, PRS 43%). This compares to 10% for those who own their property outright and 23% for those with a mortgage. The proportion of households with one bedroom in excess of minimum requirements is 41% for PRS and 34% of the social tenures. This compares to 34% for those who own their property outright and 41% for those with a mortgage. The PRS and social sectors are less likely to have two or more bedrooms more than the minimum requirements (social 10%, PRS 13%), compared to 55% of those who own their property outright and 34% of those with a mortgage.
- **Household income** – Higher income households (those earning over £700 per week) are more likely to live in dwellings with two or more additional bedrooms (43%) than the national average (33%). There is very little difference across income categories for the proportion of households with one bedroom in excess of minimum requirements.
- **Property age** – Under-occupied dwellings are least common amongst those homes built between 1919-1944 and 1945-1964, where 28% and 27% have two or more bedrooms in excess of the minimum requirement. This compares to dwellings built post-1982, where the rate is 37%.
- **Property type** – Detached houses have the highest rates of under-occupancy in Scotland compared to other building types: 69% of detached homes have two or more additional bedrooms. Tenements (6%) and other flats (11%) have the lowest rates with two or more additional bedrooms, but these property types are more likely to be meeting the minimum standard (52% and 41% respectively).
- **Rurality** – Under-occupation is more common in rural areas than urban areas. 46% of rural dwellings have two or more bedrooms in excess of the minimum requirements. This compares to 30% of urban properties. In addition, it is notable that urban dwellings are more likely than rural ones to meet the minimum standard (31% and 19% respectively).

### Under-occupancy and fuel poverty

It is generally accepted in Scotland that fuel poverty is caused by a combination of: low household incomes; high fuel costs; poor thermal quality of the building; and how energy is used in the home.<sup>8</sup> As a result, inadequate property condition can be exacerbated by a household's inability to heat their home to an appropriate level. National and local government policy responses to tackling both climate change and fuel poverty acknowledge

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<sup>8</sup> [https://www.pkc.gov.uk/media/900/Fuel-Poverty-Statement/pdf/Fuel\\_Poverty\\_Statement.pdf?m=636099785984670000](https://www.pkc.gov.uk/media/900/Fuel-Poverty-Statement/pdf/Fuel_Poverty_Statement.pdf?m=636099785984670000)

these factors, however it is also accepted that other aspects, such as household lifestyle and under-occupancy, may also contribute.<sup>9</sup>

The latest SHCS was published in December 2020.<sup>10</sup> The key findings report estimated that just under a quarter of Scottish households (24.6%) were living in fuel poverty in 2019, and of those 12.4% were living in extreme fuel poverty.<sup>11</sup> The fuel poverty rate for Scotland across a range of key characteristics is summarised in the key findings report. Even though fuel poverty is something that can be experienced anywhere, the highest concentrations are to be found in the most remote rural areas and in certain parts of Scotland's cities. The survey also estimates that there are high rates of fuel poverty amongst households: living in houses (57%); built in the 1919-1982 period (58%); in the social housing sector (37%); using electricity as a primary heating fuel (43%); and with pre-payment meters (36%). In addition, the SHCS demonstrates a strong association between fuel poverty and household income, with higher rates of fuel poverty being found in lower income band households.

In an evidence paper by Ahmed (2013) for the UK Government on the impact of certain household and dwelling characteristics the likelihood of a household being classed as fuel poor under the Low Income High Costs (LIHC) indicator for England was analysed. This provides a useful place from which to consider under-occupancy and fuel poverty, albeit from a slightly different context.<sup>12</sup> Under the indicator a household is fuel poor in England where:

1. they have fuel costs that are above average (the national median level); and
2. were they to spend that amount, they would be left with a residual income below the official poverty line (i.e. less than 60 per cent of median income).

The aim of this analysis was to develop a model for the UK Government of the most influential characteristics which help determine the probability of households being fuel poor. The final modelled outcome for predicting households that are fuel poor indicate a range of household characteristics associated with higher instances of modelled energy costs and low incomes which tend to increase the likelihood of being fuel poor. This included the likely impact of household under-occupancy on fuel poverty rates. Holding all other characteristics constant and equal, it is apparent that against a baseline characteristic for each group, that under-occupied households have reduced odds of being fuel poor – they are around half the odds of households which are not under-occupied.

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<sup>9</sup> [https://www.falkirk.gov.uk/services/homes-property/housing-support/repairs-maintenance/docs/statement/01%20ECO%20Flexible%20Eligibility%20Statement%20of%20Intent%20\(December%202020\).pdf?v=202109090926](https://www.falkirk.gov.uk/services/homes-property/housing-support/repairs-maintenance/docs/statement/01%20ECO%20Flexible%20Eligibility%20Statement%20of%20Intent%20(December%202020).pdf?v=202109090926)

<sup>10</sup> The SHCS is an annual survey, however no fieldwork was completed during 2020 due to the pandemic. Fieldwork was conducted during 2021, however this may mean there will be a gap in the data.

<sup>11</sup> <https://www.gov.scot/collections/scottish-house-condition-survey/>

<sup>12</sup> Masuma Ahmed (2013) "Modelling the likelihood of being fuel poor". DECC, UK Government

Though this analysis is of interest it is of limited value in Scotland where the definition of fuel poverty has broadly stuck with Boardman's 10% definition. This was refined slightly in 2019 in light of the 2017 fuel poverty definition review panel report. This led to a new statutory definition of fuel poverty being set out in the Fuel Poverty (Targets, Definition and Strategy) (Scotland) Act 2019.<sup>13</sup> The Act states that:

... a household is in fuel poverty if the household's fuel costs (necessary to meet the requisite temperature and amount of hours as well as other reasonable fuel needs) are more than 10% of the household's adjusted net income and after deducting these fuel costs, benefits received for a care need or disability, childcare costs, the household's remaining income is not enough to maintain an acceptable standard of living.<sup>14</sup>

Here the "requisite temperature and amount of hours" is defined in legislation as being 23°C in the living room and 20°C in other rooms for households requiring an enhanced heating regime. For other households, it is 21°C in the living room and 18°C in other rooms. Where enhanced heating hours is appropriate for a household, heating the home to the requisite temperatures for 16 hours a day every day is assumed. For any other household it is assumed the home is heated to the requisite temperatures for 9 hours a day on a weekday and 16 hours a day at the weekend.<sup>15</sup>

The report of the definition review panel leading to the revised Scottish definition included analysis of SHCS data in previous years (2008-2010) which indicated a modest but significant correlation between under-occupancy and fuel poverty.<sup>16</sup> The analysis was updated for the period covering 2013-2015 and further disaggregated, which indicated a different pattern. The updated analysis suggested that almost a quarter (24%) of those who are in fuel poverty and on low incomes (89,000 households) were living in homes with two or more bedrooms under-occupied; and under-occupation almost doubles (46%) for households who are fuel poor, but not income poor (204,000 households).

The review panel concluded that this data indicates under-occupancy among fuel and income poor households is relatively uncommon. The "modest but significant correlation" between under-occupancy and fuel poverty was attributed primarily to households on higher incomes and not a dominant feature of households in both income and fuel poverty. Given the significant health concerns related to under-heating any rooms that may only be used occasionally, the review panel proposed there was little justification for altering how under-occupancy is treated when estimating the prevalence of fuel poverty. However, the panel's

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<sup>13</sup> <https://www.legislation.gov.uk/asp/2019/10/enacted>

<sup>14</sup> [https://www.eas.org.uk/en/fuel-poverty-overview\\_50439/](https://www.eas.org.uk/en/fuel-poverty-overview_50439/)

<sup>15</sup> Ibid.

<sup>16</sup>

<https://www.webarchive.org.uk/wayback/archive/3000/https://www.gov.scot/Resource/0039/00398798.pdf>

description of the relationship between under-occupancy and combined fuel and income poverty as “relatively uncommon” may be misplaced given that over half the latter group under-occupy their homes in Scotland (Kearns et al. 2019). Additional evidence suggests alternatively that zonal heating may in fact hold significant potential in helping reduce energy use and costs, particularly for those households who might be disproportionately impacted by high energy costs, which may in turn help reduce estimates of fuel poverty and benefit certain groups of households.<sup>17</sup>

### What can be done about under-occupation?

The behaviours and attitudes of the fuel poor and those at risk of fuel poverty around energy use is an additional aspect to be considered. The charity Age Scotland commissioned Scotinform to conduct a quantitative survey to capture insight on the views of older people on their current housing situation.<sup>18</sup> The survey included data relating to energy efficiency and any issues older people may have in payment of fuel bills. Most respondents considered that their home was ‘*very suitable*’ (54% of respondents) and ‘*fairly suitable*’ (34%) for their current needs. The reasons given for why current properties were unsuitable included:

- internal and external access issues;
- the size of the property;
- cold–damp–heating issues;
- property in need of repair;
- location of property; and
- associated running costs.

Respondents considering a home move would choose a smaller or more manageable home (29%) and a property that could be adapted to changing needs over time (23%). It is notable that over half of the sample (55%) were unaware of each of Scottish Government schemes to assist with energy efficiency measures, with Home Energy Scotland’s advice service having the highest awareness at 28%. A very low proportion (7%) of respondents stated they always struggled to pay their fuel bills, 27% of respondents with a long-standing health problem and 35% with a disability stated that they ‘*always struggled to pay*’ and ‘*sometimes struggled to pay*’ their fuel bills.

These insights lend support the notion that a household’s “capacity for change” in terms of energy use and energy efficiency improvements is often affected by situational

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<sup>17</sup> <https://www.sciencedirect.com/science/article/pii/S0301421519301879?via%3Dihub>

<sup>18</sup> <https://www.ageuk.org.uk/globalassets/age-scotland/documents/policy-and-research/age-scotland-2020-national-housing-survey-report.pdf>

characteristics. An evidence review for the UK Government by Barnes et al. (2014) makes a similar point. This review was focused on a range of evidence across four broad areas:

1. knowledge and perceptions of energy efficiency;
2. current energy behaviours and concerns;
3. barriers and facilitators to behaviour change; and
4. organisational and community engagement.<sup>19</sup>

This review found that tenure type, financial position, ability in relation to financial management, and controlling current systems affected households' ability to evoke change. In addition, the same report highlighted studies of social housing, where tenants' capacity to change can be affected by high occupancy in terms of the number of people at home during the day (especially among the unemployed and those with young children), the number of electronic appliances in the home, and a desire in some cases to heat homes to a high level (i.e. 25°C).

Furthermore the Barnes et al. review also found that a lack of knowledge on how to operate energy saving systems and in cases where systems do not function properly can impact behavioural change at the household level. Even where capacity for change may be present, realising that potential can prove to be difficult and is often influenced by a range of factors, such as: perceptions of energy use, household structure, existing systems, financial situation, and an interest in – or capacity to use and integrate – new technologies into existing lifestyles and routines.

A number of these themes were also explored in the Kearns et al. (2019) paper on occupant behaviour as a fourth driver of fuel poverty.<sup>20</sup> This set out a conceptual framework for occupant behaviour as a driver of fuel poverty across a range of relevant factors. These included:

- housing and use of the home;
- heating and energy arrangements and thermal comfort;
- household structure and dynamics;
- health and well-being;
- household finances; and
- social activity and relations.

The authors proposed that as a policy problem fuel poverty should be considered one of “warmth and energy deprivation”, accompanied by a broader interpretation of vulnerability

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[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/332122/understanding\\_behaviours\\_households\\_fuel\\_poverty\\_review\\_of\\_research\\_evidence.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/332122/understanding_behaviours_households_fuel_poverty_review_of_research_evidence.pdf)

<sup>20</sup> <https://www.sciencedirect.com/science/article/pii/S0301421519301879?via%3Dihub>



to as well as *from* fuel poverty. This implies a need for a broader perspective, reviewing how occupant behaviour has featured in official approaches to defining fuel poverty. In England the required heating regime is reduced in respect of under-occupancy, but as noted earlier in this discussion, this is not something that is adjusted for in Scotland. This is due to a prevailing, but perhaps misguided, view that selective or zonal heating certain parts of the home will always lead to damp, mould and structural problems that can be detrimental to health.

### Conclusion and recommended next steps

It is clear from the evidence discussed in this paper that as a policy problem under-occupancy does not appear to be a very well understood concept. This is despite it potentially having a major impact on how fuel poverty is understood and how it might be tackled. This paper has sought to define exactly what we mean by under-occupancy, as well as outlining what the limited evidence on under-occupancy within the Scottish fuel poverty context has to say on the topic. In this final concluding section the various threads of evidence are brought together to suggest several recommendations which point to next steps that might be taken.

Under the Scottish definition of fuel poverty we have seen that under-occupancy occurs when a home exceeds the bedroom standard of its occupants by two or more rooms. Though differences are apparent across different household characteristics, around a third (33%) of Scottish households are estimated to have two or more bedrooms above the minimum standard. Current Scottish estimates of fuel poverty assume that all under-occupied rooms are heated to the same standards as the main bedroom. This has the consequence of increasing estimates of the fuel costs required to maintain an adequate heating regime. It is difficult to draw solid conclusions from this given that many people are heating their homes inefficiently. However, it could be artificially inflating the level of fuel poverty found across the country given that the SHCS (2013-15) data indicates almost a quarter (24%) of fuel and income poor households and almost half (46%) of fuel poor only households are under-occupying their homes.

A further key insight from the evidence is that there is currently only a limited amount of research that would deem it appropriate to challenge the decision to fix indoor heating regimes in Scotland. This means that official guidance currently states all areas of homes should continue to be heated in a relatively even manner even in colder months. In this way, both the dwelling and individual members of the household living in the home are protected. However, as we have also seen, this creates an obvious tension with current practical advice provided to households by key stakeholders about energy use and cost, which typically includes recommendations about turning down thermostats and turn off heating in rooms not in use.

Different options exist on what can potentially be done about under-occupancy and why it remains problematic from a policy point of view. A key finding of this review of evidence is

related to households' capacity for change in terms of energy use or energy efficiency improvements. These can be affected by a range of situational characteristics which, as identified in this discussion paper, may require policy makers to re-consider fuel poverty in alternative ways such as in terms of occupant behaviour across a range of relevant factors.

## Recommendations

It is clear therefore that while under-occupancy and its relationship with fuel poverty does not appear to be a very well understood concept, improving our understanding may hold great potential to improve understanding of how fuel poverty is experienced in the real world and how it might successfully be tackled. This could help reduce fuel poverty amongst under-occupying households or improve the accuracy of official estimates of fuel poverty. The following recommendations will be of most benefit to national and local government, as well as other stakeholders with an interest in tackling fuel poverty, particularly amongst the owner-occupied fuel poor and those at risk of fuel poverty:

**Recommendation 1** – The Scottish Government should commission research that can help determine the continuing appropriateness of estimates of fuel poverty assuming that all under-occupied rooms are heated to the same standards as the main bedroom (18°C). This should build upon previous fuel poverty lived experience research and include households that are under-occupying their homes and struggling to meet the high costs of energy.

**Recommendation 2** – Research should be commissioned to help understand in more detail if people living in fuel poverty in under-occupied homes are selectively heating their homes, or if they are following the recommended guidance of heating the whole home to 18°C or higher for those with an enhanced heating requirement. This could have a bearing on how fuel poverty is understood and responded to by national and local government, delivery partners and their agents, and energy advice/advocacy bodies.

**Recommendation 3** – Research should be commissioned to help understand the potential energy use, savings, costs, and benefits that might be derived from households using “zonal controls” in appropriate conditions. This work should be considered from a domestic energy, energy efficiency, and public health perspective.

**Recommendation 4** – A statistical model for Scotland could help us to fully understand the most influential characteristics determining the probability of households being fuel poor and where changes might help alleviate fuel poverty. This should include identifying the odds of under-occupied households being fuel poor and the impact of future fuel price fluctuations and other compounding factors.

**Recommendation 5** – The Scottish Government should update its analysis of the SHCS to determine the extent to which the *‘modest but significant correlation between under-occupancy and fuel poverty is largely located in households on higher incomes’* still stands considering recent sky-rocketing energy costs.

**Recommendation 6** – The Scottish Government should expand its work with stakeholders and other key partners to increase public awareness of what practical things can be done by households living in different housing sectors to make the costs of energy and/or heating more affordable.

**Recommendation 7** – The Scottish Government should explore the benefits for households of tailoring its energy and fuel poverty policies and advice services to align with households’ capacity for change. This could hold significant potential to help alleviate fuel poverty across housing tenures.

**Recommendation 8** – As the costs of energy continue to rise some households may need dedicated support for living in under-occupied homes. Some may want to consider moving somewhere more affordable and/or suitable for their household size. The Scottish Government should support all households struggling to meet the costs of energy and/or heat in under-occupied properties and, where appropriate, offer practical advice and support to help them make informed decisions about where they live and in what size or type of property.