



Contents lists available at ScienceDirect

Energy Research & Social Science

journal homepage: www.elsevier.com/locate/erss

Original research article

‘Getting the measure of fuel poverty’: The geography of fuel poverty indicators in England

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ARTICLE INFO

Keywords:

Fuel poverty
Vulnerability
Indicators
Spatial analysis

ABSTRACT

Recognition of the negative impacts of fuel poverty, a lack of sufficient energy services in the home, has generated considerable interest in how the phenomenon can best be measured. Subsequently, the most well-known indicators deployed in policy-making, the established 10% indicator and the recent Low Income High Cost (LIHC) indicator, have generated considerable discussion and critique. One facet of the debate that remains unexplored is the effect of a change in indicator upon the spatial distribution of fuel poverty. Using spatial analyses we interrogate sub-regional estimates of the two indicators in England, where the LIHC indicator was first conceived. Three principle findings are discussed, enhancing understanding of the geographic features of fuel poverty as understood by each indicator. Firstly, the reduction in fuel poor households has disproportionately affected areas with lower housing costs. Secondly, there is a higher prevalence of fuel poverty in urban areas. Finally, the condition is more spatially heterogeneous with fewer ‘hot-spots’ and ‘cold-spots’. As a result, each indicator captures different notions of what it means to be fuel poor, representing particular vulnerabilities, losses of wellbeing and injustices. This has implications for the targeting of limited alleviation resources and for alternative national contexts where the LIHC indicator might be deployed.

1. Introduction

In industrialised nations, interest in fuel poverty commonly stems from a concern about excess winter deaths and poor health due to cold homes [1]. In defining fuel poverty, emphasis has traditionally been placed on affordability, focusing upon the drivers of low incomes, domestic energy inefficiency and high energy prices [2]. This approach is often reflected in policy-making [3]. However, during the past three decades a burgeoning research agenda has become apparent, primarily within the social sciences, that draws attention to the multi-dimensionality of the phenomenon [4]. Here, fuel poverty is more broadly defined as an inability to attain the socially and materially necessitated domestic energy services that ensure the wellbeing of a household, allowing them to participate meaningfully in society [5]. Within this agenda, a stronger emphasis has been placed upon the considerable geographic component that influences whether a household is likely to fall into fuel poverty [6–8]. This reflects how fuel poverty varies between different locales, due to the uneven, and often distinctive, spatial distributions of contributing factors [6].

To date, interest in the geographical components of fuel poverty has

rarely translated into national scale policy-making, with the exception of Northern Ireland (NI) where progress has been made in area-based targeting of fuel poor households [9]. This reflects a wider erosion of spatial policy-making over the last decade [10]. Instead, in the few geographic contexts in which the incidence of fuel poverty is measured, expenditure-based indicators are relied upon to provide a national estimate of households, with little attention given to the localised geographies of fuel poverty they succeed in creating [11,9].

Measurement of fuel poverty is perhaps most developed in England, where a review by Professor John Hills, ‘Getting the measure of fuel poverty’, has triggered the replacement of the former 10% indicator with a Low Income High Cost (LIHC) indicator [3]. Although not yet implemented elsewhere, the LIHC indicator has attracted considerable attention within different national contexts [12,7,13,14]. Valuable academic literature has explored the implications of the change in the measurement approach for the economic [15–17], social [15–18] and political [18] cleavages of the fuel poverty debate, however, the spatial dimension of the change has been overlooked.

The aim of this paper is to understand how the spatial distribution of fuel poverty using a LIHC indicator compares to that of the former 10%

Abbreviations: AHC, After Housing Costs; BEIS, Department for Business, Energy and Industrial Strategy; BHC, Before Housing Costs; DECC, Department for Energy and Climate Change; LA, local authority; LIHC, Low Income High Cost; LISA, Local Indicator of Spatial Association

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<http://dx.doi.org/10.1016/j.erss.2017.09.035>

Received 3 April 2017; Received in revised form 3 August 2017; Accepted 22 September 2017

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indicator, focusing upon England as a case study. In highlighting the difference in the geographic characteristics of fuel poverty as understood by each indicator, we provide insight into the way in which particular geographies are prioritised depending upon the measurement approach adopted. If, as is the case in England, these indicators are used to find the fuel poor and inform the targeting of alleviation measures, our findings offer further understanding of which households are most likely to benefit from the resources available. This is of considerable importance in an arena in which alleviation resources are often insubstantial given the scale of the problem [19]. Whilst the analysis focuses upon England, our results have wider implications for alternative national contexts in which the indicator might be deployed. More broadly, in achieving this aim we are concerned with the extent to which the increasing engagement of geographers and spatially-concerned scientists with energy studies has infiltrated into the governance of energy challenges, specifically fuel poverty.

The paper is structured as follows. In section two, we summarise findings from wider research concerning the spatial characteristics of fuel poverty before discussing in section three the concepts of socio-spatial vulnerability and justice that are increasingly mobilised. In section four, the 10% and LIHC fuel poverty indicators are outlined. The methods used to explore the spatial distribution of fuel poverty using each indicator are explained in section five, including various spatial statistics and cluster analyses. In section six, we discuss the results of these analyses, identifying key differences in the geographic characteristics of fuel poverty as understood by each indicator. The final section, section seven, offers conclusions and implications for policy. These policy implications are twofold. Firstly we consider the implications for policymakers using the LIHC indicator to find the fuel poor. Secondly, we reflect upon whether the use of either indicator alone is sufficient given the different geographies of fuel poverty that each prioritises.

2. The spatial characteristics of fuel poverty

Individuals and households move in and out of fuel poverty, whether due to a fluctuating need for energy seasonally, an unexpected bill or a change in circumstance. There are also households that find themselves trapped in persistent fuel poverty [20]. In spite of these temporal fluctuations, there are still underlying characteristics that enhance the likelihood of these households experiencing fuel poverty that have uneven spatial distributions. This includes spatially-based attributes that are directly coupled with geography, such as the material and infrastructural characterisation of an area, and those that lend their collective attribute to the space as a result of aggregation, for example, demographic characteristics [21].

Interest in the spatial distribution of fuel poverty ranges from a recognition that the condition is ‘locally contingent’ upon different national contexts ([77]: 282), to acknowledgment of the ‘local realities’ of fuel poverty within different neighbourhoods and households ([9]: 9). In quantifying fuel poverty across the European Union, Thomson and Snell [22] highlight its high prevalence in Southern Europe due to low thermal efficiency standards, despite a relatively mild climate. A high prevalence of fuel poverty in Eastern Europe is also recognised where post-socialist neoliberal reforms of economic and legal systems have led to energy price increases and reduced social welfare [5]. At a national-scale, Rudge [23] documents the difference between the British experience of fuel poverty and that of the rest of Europe, due primarily to the changeable climate and the historical legacy of poor quality housing. Even within the United Kingdom (UK) there exist significant disparities between the devolved nations (England, NI, Scotland and Wales) with a high prevalence outside England. For example, the cost of heating and lighting is greater in NI due to the colder climate and reliance on oil-fired heating [16]. Spatial variations also exist regionally in energy prices and exposure to particular climatic conditions [24].

At a more localised scale, the likelihood of experiencing fuel poverty varies between different household types and demographics and therefore also geographically, as households with similar characteristics tend to cluster in particular locales [7]. Varying characteristics mean that households require different levels of consumption and expenditure to achieve the same levels of comfort and wellbeing, characteristics that include age, income, employment, composition, health and ethnicity. For example, households with young children, pensioners or a member with a disability or long-term illness all have enhanced vulnerability due to an increased physiological need for energy services, amongst other factors [25–27]. In the UK, families with young children are more likely to live in urban or suburban areas, those with a disability or long-term illness are concentrated in urban areas or coastal communities and pensioners are more likely to live in rural and coastal communities [28].

It is also common within fuel poverty research for a distinction to be made between rural and urban areas [29,20]. Urban and rural households are embedded in differing wider systems of infrastructural provision and institutional arrangements [30,31]. Within these broad rural and urban typologies fragmentation of power networks has occurred and enclaves of well-connected consumers exist [31]. The radical economic liberalisation of infrastructure and markets in the energy sector since the 1980s has allowed for the ‘unbundling’ of infrastructures relating to energy transmission and for the ‘bypassing’ of less valued or powerful consumers and places. In cities, this has entrenched inequalities between those that are networked and connected, and those who are not. This inequality is often symbolised by the pre-payment meter, a means of paying for energy services that requires credit in advance, often used in low income households more likely to accrue debt [31,32]. In rural areas that are expensive to supply, cross-subsidies from more lucrative urban areas have been dismantled resulting in reliance upon expensive fuel types (primarily oil) in isolated households not connected to the gas network [31]. This lack of access to cheaper fuels also extends to flats in high density urban areas [20]. In addition to networked infrastructure, the housing stock, a complex arrangement of materials and technologies of varying efficiency, also varies spatially. Inner-city areas are often characterised by inefficient pre-1917 terraced housing [23] whilst rural areas tend to be associated with older, solid wall properties [20]. Urban neighbourhoods also have a disproportionate number of inefficient properties in the private rented sector in which tenants lack housing rights [33] and access to retrofitting schemes [34]. In rural areas there is a higher concentration of under-occupancy leaving some smaller households in disproportionately large properties that require excessive heating to maintain adequate warmth [35].

Austerity policies implemented by governments across Europe and the United States, particularly in the wake of the Financial Crisis in 2008, have led to geographically concentrated cuts to welfare, cuts that can enhance the likelihood of households experiencing fuel poverty. For example, in England, the erosion of incomes, local services and infrastructure provision has disproportionately impacted less prosperous local authorities (LA) that have a high reliance upon welfare, many of which are former industrial or mining areas [36]. From 2009 to 2016 the most deprived tenth of LA experienced spending cuts of 28% per capita compared to the least deprived tenth that cut spending by just 16% [37].

3. Socio-spatial vulnerability and justice

Much of the recent focus upon the spatial characteristics of fuel poverty has stemmed from literature that mobilises the concept of social vulnerability [6,38,4] and increasingly justice [7,39]. Each concept highlights the uneven spatial distribution of factors known to enhance the likelihood of a household falling into fuel poverty.

Social vulnerability can be understood as the degree of susceptibility within a household to a stress that is not sufficiently

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