

Objective vs. subjective fuel poverty and self-assessed health

Manuel Llorca^a, Ana Rodriguez-Alvarez^b, Tooraj Jamasb^a

^aCopenhagen School of Energy Infrastructure, Department of Economics, Copenhagen Business School (DK), ^bOviedo Efficiency Group, Department of Economics, University of Oviedo (ES)

Identification of fuel poverty and its impact on individuals is a growing social issue. Classifying households using subjective measures of fuel poverty yields different results than when objective measures are used. Moreover, there are assessment-related difficulties in establishing the effects on health and wellbeing, which hinders policy design to tackle this problem. We analyse the influence of several socioeconomic characteristics on self-reported health with special focus on fuel poverty and find that poor housing conditions, low income, material deprivation and fuel poverty have a negative impact on health.

Following the financial crisis, energy prices increased while income decreased leading to more fuel poverty in many countries (Figure 1). In Spain, the slow recovery after the financial crisis led to low GDP per capita and high unemployment. Simultaneously, energy prices increased even more than the European Union average, which in conjunction with the former, raised concerns about the issue of fuel poverty in Spain. Especially, since the World Health Organization finds empirical evidence of the negative effect of fuel poverty on physical and mental health.

Despite the emerging evidence, fuel poverty was not a policy priority in Spain until about 2016. Since then Spain has been addressing this issue and faces the significant challenge of defining measures of fuel poverty and their relationship with the health status of individuals.

As we focus on self-assessed health, **it is important to include subjectivity and perception of health since objective measures alone may not fully capture the adverse effect of fuel poverty on health.**

Subjective and objective measures capture a broader picture, including the 'feeling' of material deprivation potentially affecting self-reported health to different degrees. Hence, to analyse the effect of fuel poverty on self-assessed health, we use an objective index in conjunction with a subjective measure (Figure 2). We look at self-reported health data in Spain¹ from 2011-2014, where 5.1 million people - corresponding to 11%

Fuel poverty usually refers to households that cannot afford to heat their homes to an adequate standard of warmth and meet other energy needs in order to maintain their health and well-being (European Energy Network, 2019).

Figure 1: Definition of fuel poverty

of the population - could not afford to heat their homes to an adequate level in 2014 (Tirado Herrero et al., 2016).

In the analysis, **we find that, in general, poor housing conditions, low income, material deprivation and 'objective' fuel poverty have a negative impact on health.** Further, our model arranges the individuals in two classes. This classification is based on the subjective measure of fuel poverty, i.e. the affordability of the household to keep the home at an adequate temperature during the winter. If an individual identifies as being in fuel poverty, the individual is more likely to be in Class 1 and to report lower health than in Class 2. Additionally, higher objective fuel poverty increases the probability of reporting poor health for the individuals in Class 2 but does not seem to have a significant effect on self-reported health for individuals in Class 1. We interpret this as that these individuals tend to report poor health regardless of the objective conditions under which they live.

¹ We use self-assessed health from the Life Conditions Survey, in Spanish: Encuesta de Condiciones de Vida (ECV)

Accordingly, we find that an individual's perception of its fuel poverty is related to its self-reported health. Further, the effect of objective fuel poverty and other poverty-related factors on health are stronger when we control for unobserved heterogeneity among individuals.

Objective measures of fuel poverty are not always good determinants of self-reported health because they do not take individual perception into account. A combination of both approaches should be used when analysing the effects of fuel poverty on individual health. This way policies can be designed aimed at tackling fuel poverty and improving public health. Further, it can mitigate the mismatch between the definition of fuel poverty and eligibility for assistance that frequently arises and increases the total costs of tackling the problem of fuel poverty. **Therefore, we advocate policy approaches that combine both objective and subjective measures and its application by policymakers.**

Further, it is imperative to avoid that the burden of the internalisation of external costs of carbon emissions from climate change policies mainly fall on the most vulnerable member groups of the society. For instance,

renewable energy surcharges in electricity tariffs can imply the application of a 'regressive tax' that ultimately affect more the poor.

The **objective index of fuel poverty** is constructed based on the minimum living costs that provide "what you need in order to have the opportunities and choices necessary to participate in society" (Bradshaw et al., 2008, p. 1), and also on the average and the household-specific expenditure on energy in relation to the net disposable income of each household.

The **subjective measure of fuel poverty** reflects whether a household cannot 'afford' to keep their home at an adequate temperature during winter. We include this variable to control for the individual's underlying personality traits (perception and subjective assessment) when reporting the health status.

Figure 2: Measures of fuel poverty

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