institute for structural research

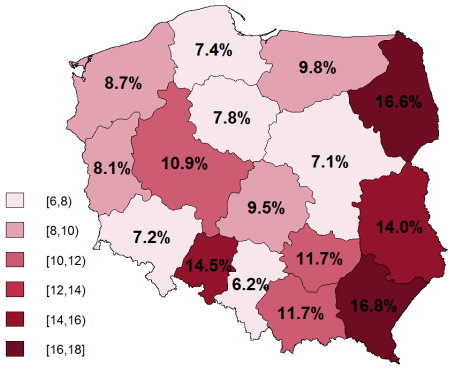
Location, location, location. What accounts for regional variation of fuel poverty in Poland?

Maciej Lis, Agata Miazga, Katarzyna Sałach

The fuel poor are persons experiencing difficulties in meeting basic energy needs at their place of residence at a reasonable price. Satisfying energy needs involves providing both comfortable temperature at home and access to energy sources (e.g. gas, electricity) which ensure biological and social functioning. There are three main components of fuel poverty: high energy prices, low incomes and low energy efficiency of dwelling. Unfavourable combination of these components can make a household fuel poor.

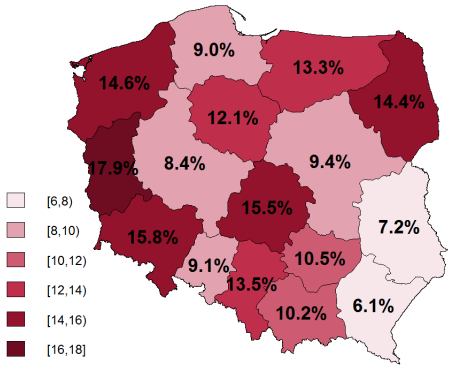
The aim of this article is to explain spatial variation of fuel poverty in Poland. According to LIHC (Low Income High Costs) indicator, which points out to these households that have low incomes and high energy expenditures at the same time, fuel poverty in Poland in 2014 concerned 9.6% of households (ca. 4.4 mln people). However, its incidence varied a lot among regions and it concerned mainly eastern voivodships: *Podkarpackie* (17% of households), *Podlaskie* (17%) and *Lubelskie* (14%); as well as *Opolskie* (15%). Its lowest level was recorded in the richest regions: *Śląskie* (6%), *Mazowieckie* (7%), *Dolnośląskie* (7%), and *Pomorskie* (7%) (Figure 1). Hence, the difference in the risk of fuel poverty between the extreme voivodships was almost triple.

Figure 1. LIHC fuel poverty rates in voivodships in Poland in 2014 [%]



Source: Own calculations based on Polish HBS data 2014.

Figure 2. "Lack of thermal comfort" (subjective fuel poverty) rates in voivodships in Poland in 2014 [%]



Source: Own calculations based on Polish HBS data 2014

The subjective measure of fuel poverty shows similar scope with 11.5% of households in Poland declaring living in underheated accommodation in winter. Like in the case of the LIHC measure, regional variation of subjective measure was almost triple: from 6.1% of fuel poor households in *Podkarpackie* to 17.9% in *Lubuskie* (Figure 2). The regions highly at risk were also *Dolnośląskie* (16%), *Łódzkie* (16%), *Zachodniopomorskie* (15%) and *Podlaskie* (14%) voivodships.

In majority of voivodships the two considered dimensions of fuel poverty did not coexist: where LIHC fuel poverty rate was high, subjective fuel poverty rate was low, and conversely. The exceptions were observed in *Podlaskie*, where both fuel poverty dimensions were high, and *Mazowieckie* and *Pomorskie* with relatively low fuel poverty rates regardless of the measure.

The reasons for high variation of fuel poverty in Poland are numerous: the diversity of buildings' characteristics that dominate in different regions (their type, age, type of heating, floor area), differences in households' characteristics (of which the most important was the level of income), level of urbanisation, climate and energy prices. LIHC dimension of fuel poverty was mainly influenced by the level of households' disposable income and floor area: the lower incomes and the larger floor area to be heated, the higher risk of fuel poverty. The subjective fuel poverty, however, was mostly influenced by buildings' characteristics, especially their age: the older the dwelling, the higher the probability of being fuel poor.

The concentration of LIHC fuel poverty in the east of Poland is hence correlated with the dominance of single-family housing with large floor areas there. Relatively low incomes of inhabitants of these regions are also significant. On the other hand, high percentage of households declaring lack of thermal comfort in winter in their dwellings on the west of Poland has its source in the age structure of buildings. In *Dolnośląskie*, *Lubuskie* and *Zachodniopomorskie* voivodships many people (31-42% in comparison to average 20% in Poland) occupy dwellings built before 1946, which are usually highly energy inefficient.

The level of urbanisation only indirectly influences the risk of fuel poverty: it acts mainly by buildings' characteristics (detached houses dominate in rural areas, whereas blocks of flats in cities; houses located in rural areas have on average twice bigger floor area than flats in blocks) and by socio-economic characteristics (rural areas' inhabitants have on average lower incomes than cities' inhabitants).

Climate and energy carriers' prices have greater impact on fuel poverty measured by subjective indicator than by the LIHC one. The reason for this is that the LIHC measure does not take into account differences in neither temperatures nor energy prices in its construction. In 2014, the differences in district central heating prices between voivodships in Poland were up to 40% (3.18 PLN per sq. m in *Opolskie* in comparison to 5.27 PLN per sq. m in *Podlaskie*). In those voivodships, where central heating prices where high, the risk of subjective fuel poverty was also high. The differences in yearly average air temperatures between voivodships in Poland were slight (up to 3°C). However, in the coldest voivodship (*Podlaskie*) low temperatures did not remain irrelevant for high fuel poverty rate.

Full version of the article:

Lis M., Miazga A., Sałach K. (2016), *Location, location, location. What accounts for regional variation of fuel poverty in Poland?*, IBS Working Paper 09/2016. http://ibs.org.pl/en/publications/location-location-location-what-accounts-for-regional-variation-of-fuel-poverty-in-poland/