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4.8. Analysis of households' living conditions by Voivodeship

Tomasz Panek

4.8.1. Comparison of households' living conditions

Households' living condition levels by Voivodeship were compared on the basis of a taxonomic measure of living conditions⁴³.

The taxonomic measure of living conditions is the composite indicator being the product of the input of all the variables (indicators) describing the financial need-fulfilment capacity for all living condition types selected in the research and arranged according to Voivodeship.

Household living conditions in each Voivodeship are estimated by comparison of selected variable values for each Voivodeship with values of these variables for a hypothetical model Voivodeship.

The variables used in the construction of taxonomic measure of living condition are different in nature, namely:

stimulant – variables the rising value of which indicate improvement in household living conditions in a Voivodeship.

destimulant – variables the rising value of which indicate deterioration in household living conditions in a Voivodeship.

The starting point for building up a taxonomic measure of living conditions is selecting variable values for the model Voivodeship. These are the optimal values of each variable describing household living conditions in the Voivodeships with the stimulant variables as maximum values and the destimulants the observed minimal values from all compared Voivodeships. When the comparative analysis refers to a number of periods at the same time, optimal values are set as the smallest or largest among all compared Voivodeships in all analyzed periods. The model Voivodeship therefore is an ideal model against which each Voivodeship is compared. In formal terms, compared Voivodeship and the model are represented by points in the space of variables that describe them. The dimension of this space (the number of axis defining the dimension) is equal to the number of variables describing living conditions in the Voivodeships.

The next step of the procedure is to standardise the values of the selected variables. This allows both elimination of measure units and the avoidance of a share prevalence of high-value variables in the living condition number values.

Values of synthetic measure of living conditions (like group measures of living conditions in each of their dimension) are obtained by calculating the distance between individual points representing Voivodeships in relation to the point representing the model Voivodeship. The better the households' living conditions in a given Voivodeship the smaller the distance between its point and that of the model. Thanks to appropriate normalisation both group measures of living conditions in each of its dimension, and the synthetic measure of living conditions always appear as values from interval [0; 1]. The better the living conditions, the closer the appropriate measure of living conditions is to 0 and the worse the conditions the higher the value.

The comparative analysis of living conditions by Voivodeships was conducted as already mentioned from the point of view of households' financial means of fulfilling needs in selected areas. This means that assessment of the level of certain needs' fulfilment especially as regards culture and recreation may include a lack of feeling certain needs, which then causes a lack of financial problems in this respect.

Śląskie, Mazowieckie, Opolskie and Wielkopolskie were the Voivodeships reporting the highest standards of living (column 10 in table 4.8.1) in 2013 with the lowest recorded for Lubelskie, Łódzkie, Świętokrzyskie and Warmińsko-Mazurskie.

The hierarchy of Voivodeships was varied in terms of needs fulfillment levels in each area of living conditions. In the case of income, clearly the best situation was noted in Mazowieckie, Pomorskie and Zachodnio-Pomorskie and the worst in Lubelskie, Świętokrzyskie and Podkarpackie.

As far as nutrition was concerned, the highest needs fulfilment was recorded in Wielkopolskie, Opolskie and Podlaskie and the lowest in Warmińsko-Mazurskie, Dolnośląskie and Lubelskie.

Needs in terms of material affluence were most fulfilled in Pomorskie and Dolnośląskie and least in Warmińsko-Mazurskie, Łódzkie and Podkarpackie.

⁴³ The algorithm of taxonomic estimated measure of life conditions is presented in Annex 4.1. The taxonomic measure of life conditions was based on a development measure of taxonomic construction (Hellwig, 1968; Panek, 2013).

The highest needs fulfilment for housing conditions occurred in Zachodnio-Pomorskie, Podkarpackie and Śląskie with the lowest in Lubelskie and Świętokrzyskie.

Children's education was at the highest level in Opolskie and Świętokrzyskie and at the lowest in Lubelskie and Podlaskie.

Healthcare needs were best satisfied in Opolskie and Śląskie with the poorest service in Świętokrzyskie, Dolnośląskie and Warmińsko-Mazurskie.

Needs to participate in culture and recreation/activity were met at the highest level in Opolskie, Śląskie and Podlaskie, and the lowest occurred in Dolnośląskie, Łódzkie and Świętokrzyskie, while recreation was best in Opolskie and Kujawsko-Pomorskie and worst in Podkarpackie and Świętokrzyskie.

Table 4.8.1. Household living conditions by Voivodeship in 2013 from best to worst

Voivodeship	Living condition dimensions								total
	income	nutrition	material affluence	housing conditions	children's education	healthcare	participation in culture	recreation	
Śląskie	0.380	0.301	0.435	0.324	0.339	0.266	0.225	0.271	0.278
Mazowieckie	0.000	0.324	0.642	0.340	0.482	0.427	0.320	0.253	0.334
Opolskie	0.537	0.109	0.525	0.617	0.243	0.232	0.192	0.128	0.393
Wielkopolskie	0.445	0.102	0.674	0.470	0.654	0.527	0.292	0.195	0.449
Zachodniopomorskie	0.322	0.326	0.533	0.262	0.358	0.456	0.504	0.613	0.459
Małopolskie	0.347	0.276	0.602	0.369	0.643	0.356	0.481	0.566	0.501
Kujawsko-pomorskie	0.546	0.368	0.695	0.678	0.355	0.498	0.425	0.193	0.569
Pomorskie	0.325	0.344	0.301	0.335	0.698	0.570	0.709	0.606	0.571
Dolnośląskie	0.401	0.542	0.316	0.401	0.626	0.723	0.741	0.225	0.590
Lubuskie	0.489	0.342	0.421	0.686	0.545	0.705	0.423	0.320	0.598
Podlaskie	0.558	0.259	0.523	0.608	0.718	0.455	0.234	0.597	0.606
Podkarpackie	0.680	0.425	0.745	0.304	0.548	0.468	0.353	0.629	0.657
Warmińsko-mazurskie	0.567	0.925	0.767	0.664	0.693	0.722	0.460	0.292	0.723
Świętokrzyskie	0.709	0.429	0.631	0.682	0.317	0.731	0.728	0.631	0.739
Łódzkie	0.548	0.490	0.745	0.684	0.451	0.628	0.738	0.627	0.757
Lubelskie	0.726	0.522	0.631	0.699	0.732	0.686	0.394	0.610	0.772

4.8.2. Grouping of Voivodeships by similarity of living condition structure

The underlying aim of grouping Voivodeships was to define a group of most similar regions in terms of living condition structure as described by variables representing assessment of need fulfilment levels gained from the taxonomic measure of living conditions (table 4.8.1). The Voivodeships were grouped with the aid of the *k*-means method⁴⁴ (Panek, 2009), which maximalises inter-group variation and minimalises variation inside the groups.

The starting point of the *k*-means method is a decision on the number by which to divide the population of Voivodeships:

Group 1: Kujawsko-Pomorskie, Mazowieckie, Opolskie, Śląskie and Wielkopolskie;

Group 2: Małopolskie, Podkarpackie, Podlaskie and Zachodnio-Pomorskie;

Group 3: Dolnośląskie, Lubuskie and Pomorskie;

Group 4: Lubelskie, Łódzkie, Świętokrzyskie and Warmińsko-Mazurskie.

Group 1 is characterised by relatively the highest average need fulfilment level in all selected living condition areas with the exception of material affluence and housing conditions.

In Group 2, we observe the lowest average need fulfilment level in terms of rest and recreation and the highest for housing conditions. However, in the remaining living condition areas the average need fulfilment is also relatively low.

Group 3 were, in 2013, relatively the weakest at fulfilling needs in the areas of children's education and participation in culture with relatively the highest average need fulfilment level in the remaining analysed living condition areas in relation to other groups. In this group, satisfaction was relatively the highest in the case of management of material needs.

Finally, in Group 4, need fulfilment was relatively the weakest in all the selected living condition areas apart from children's education and participation in culture and rest and recreation.

⁴⁴ Please see Annex 4.2 for a description of the *k*-means method.

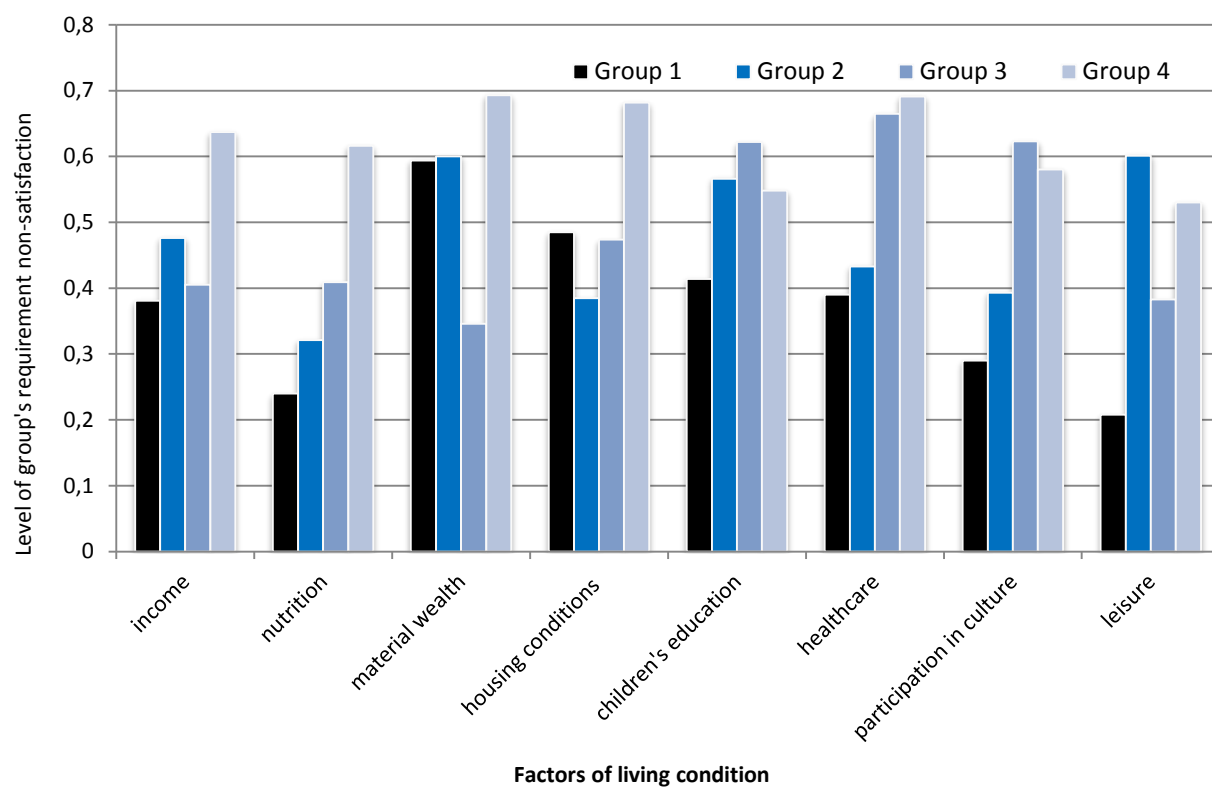


Figure 4.8.1. Households' assessment of living conditions for Voivodeship groups in 2013