

DIFFERENTIATION OF HUMAN POTENTIAL QUALITY IN REGIONS OF UKRAINE: DEMOGRAPHIC AND HEALTH ASPECTS

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ABSTRACT

This study describes a method for evaluating the quality of human potential within Ukraine's current conditions, by looking at the demographic and valeologic (healthy living) component. This research was conducted on the basis of Ukraine's regional data. In addition to measuring the level of quality development according to this component, the method aims to classify regions on its basis. Such classification is a justification for regional policies geared at human development and for distribution of resources by region. The study uses a discriminant analysis as well as some methods of taxonomic analysis. As a result of the analysis, Ukrainian regions were divided into four groups. The method applied in this research is universal and can be used to assess and classify regions according to other components of human potential quality, provided that relevant indicators are applied. It can also be approved and implemented in other countries because the statistical database is quite unified in terms of indicators that are included in the analysis.

Key words: human potential quality, demography, valeology, regions of Ukraine, classification, discriminatory analysis

JEL codes: O15, J1, I12

INTRODUCTION

Population growth in European countries is characterized by narrowed demographic reproduction, ageing of native European-born citizens, and an increase of migration processes. Increasing competition for human resources is leading to a transformation in the requirements for quality of those resources. And it is the quality that is an inexhaustible source of capacity enhancement in today's environment and has creative and innovative significance to the economy [Juran and Gryna 1993]. The importance of the quality of human resources has been confirmed in the policy papers of the European Commission [EC 2016]. Moreover, the quality of human capital in the European economy is

regarded as one of the most important goals of the Europe 2020 strategy.

On the other hand, modern conditions impose special requirements on the living environment, on the ability of national economies to ensure high social standards and living conditions, on complying with the provisions of decent work, and many other demands that shape human development and its qualitative characteristics. In this regard, an article on Human Development [UNDP 2018] notes that the study of this development should go beyond the assessment of average and disaggregated statistical data that characterizes the quantitative aspect. The content of the results obtained is more important. Such quality is particularly reflected in ensuring that

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the benefits of human development are shared by everyone.

Important in the context of the study are the features of the socio-economic development of Ukraine – a relatively young independent state (since 1991). The economic difficulties that the country is experiencing are related primarily its economic orientation toward raw materials, the lack of stability in the national currency, low labour productivity and low standard of living. Under conditions brought about by liberalization of inter-territorial displacement regimes, migration in all its forms – educational, labour, and permanent – is activated. This leads to demographic loss of human potential, narrowing the base of its reproduction possibilities in the future. At the same time the standard of living in Ukraine is much lower than in the European countries, and difficulties in the health care system are causing a deterioration of the valeological characteristics of the population – physical and mental health. The solution of the above-mentioned problems has been complicated by the conditions ensuing from the military conflict in eastern Ukraine and Russia's annexation of Crimea.

There are several approaches to the theoretical study of human potential: potentialistic – properties of a person or society, which can be used to obtain benefits or income under favourable conditions; dynamic – the ability to self-development and change [Solntseva and Smolian 1999], pragmatic [Kelle 1999, Shaulska 2005], spiritual and intellectual, spiritual and cultural [Zlupko and Radetskyi 1999, Vovkanych and Semiv 2007], synergetic [Semiv 2004], synergistic and energetic [Sadova and Stepura 2017].

However, modern empirical research is more connected not with the assessment of human potential, but with human capital, which embodies an aspect of the use of human potential. There are many such studies that are focused on the assessment of a particular side or component of human capital, as well as on the impact of its use with regard to the efficiency of the national economy as a whole or to a company's economy in specific. Czajkowski [2012], as well as Miciuła and Miciuła [2015] suggest grouping methods of human capital assessment depending on the value (cost) of its creation, its future profitability, coverage by educational processes, etc. Studies by Dobija [1998], Turner

[1996] and Abdel-Khalik [2003] have shown that certain qualitative characteristics of human capital affect an enterprise's market value and its ability to generate income.

Evaluations of quantitative aspects are usually related to the calculation of investment in education and years of study. However, certain controversial issues arise when research is focused on the qualitative, rather than quantitative, aspects of human capital. For example, if the duration of studies can be a quantitative measure of human capital, the impact of such studies is likely to vary from country to country. And this variance can be very noticeable (for example, when comparing education in Germany and in an African country). Accordingly, human capital as a factor of economic growth cannot be taken into account as a result of purely quantitative measurement without taking qualitative estimates into account [Cichy and Malaga 2006]. Cichy and Malaga [2006] note that the wage gap can be a marker of the quality of human capital. The authors base their model on the assumption that the only measure of the quality of human capital is the wage rate per unit of human capital. However, it is assumed that evaluations could be complemented by taking into account technological progress and development.

Another study [Balcerzak and Pietrzak 2016] presents a combination of the assessment of the innovativeness of the economic environment and the quality of human resources. A synthetic measure of the quality of human capital is an integral index of macroeconomic efficiency and the labour market; quality of education; and the national system of innovation.

Another cross-section of human resources quality research relates to the spatial dimension: either national or regional. In such a context, there is a question of territories gradation according to certain quality criteria and target setup, i.e. the classification or creation of typologies of regions. This approach is more or less evident in many of the studies above, as well as in any ratings, as the classification itself allows for the identification of trends, activities and financial needs for implementation of management influence. However, there are studies directly devoted to the issue of spatial gradation in terms of human resources or human development quality.

For example, one study [Rimashevskaya et al. 2014] uses an index method to classify the regions of the Russian Federation according to the level of quality in their human and labour potential. The assessment included the following blocks: demographic, health, education, welfare, intellect, psychophysiological state, social and personal components.

Typologies differ from classification by their higher degree of generalization and a deeper content of categories assigned, as well as by some other features. The first typology of human development characteristics dates back to the first global report on human development issued in 1990 [UNDP 1990], where the categories of balanced and harmonious human development and critical imbalance varied. Achievements (progress) and ademptions (deprivations) were used as criteria for creating the typology. Later, each of the Annual Reports has complemented in one way or another the typology categories – sustainable human development, imbalance, unequal level of consumption and human development, poverty, asymmetry of development, and resilient progress.

In this regard the studies carried out by Asian scientists also deserve attention. Comparative analysis of human development indicators in the context of quality of life, and ensuring decent conditions for attaining higher levels, are reflected in the works of ul Haq [1995], a Pakistani scientist, and Amartya [2009], an Indian scientist. Their ideas actually became the methodological basis for estimating the human development index. Improvement in the methodology of regional typologies by the level of human development was carried out by a team of Indian researchers [PCGI 2002]. During the work on the National Human Development Report, scientists developed a methodology that takes into account the level of development according to eight indicators. The regions of India were classified as ‘balanced’ and ‘symmetrical’; the dynamic aspect was characterized by such terms as ‘steady’, ‘significant’, and ‘marginal’.

AIMS AND METHODS

Human potential quality (HPQ) is an objectively determined and realistically formed set of integrated properties of a single person (as an organism, individual, personality) and of regional communities of people. Such properties are manifested or can be manifested under certain conditions of living environment (life and work), and indicate possible limits of reproduction of the structures (components) of a person and regional communities of people. The HPQ structural composition is a systemic unity of a variety of components: demographic and valeologic, educational and intellectual, professional and qualificational, social and cultural, moral and ethical, as well as ekistical (the study of human settlements.) At the same time, a comprehensive study and typology of the regions of Ukraine on the basis of HPQ should be preceded by a separate assessment of differentiation within each component. Every component is characterized by a system of development indicators. For the demographic and valeological¹ component, such features include the life potential of people, in particular, of working age people, human potential reproduction, as well as health.

Thus, we can specify the purpose of this research: to differentiate the level of HPQ development in regions of Ukraine according to the demographic and valeological component and to classify the regions on this basis. The applied task is accomplished using methods of taxonomic and discriminant analysis. The main objective of the research is to classify (recognize) the objects (regions of Ukraine) according to the hypothetically pre-formed groups based on HPQ (demographic and valeological component). Based on the research purpose, the task of classification is formulated as a breakdown of observation objects (regions of Ukraine) into a predetermined number of groups (or into a number specified in the process of analytical calculations) on the basis of the criterion of distance from the group centres (centroids). The final research

¹ Valeology is a modern science engaged in the study of human health through a comprehensive approach. The objects of valeology include nutrition, human body functioning, physical condition, adaptation to the environment, working capacity, etc.

hypothesis is the classification of Ukrainian regions on the basis of HPQ (demographic and valeological component) formed by means of taxonomic methods and scaling.

Classification and further typologization of the regions of Ukraine according to HPQ is an important step to justify the differentiation of management impacts on the processes of formation and preservation of HPQ, as it is the main present-day resource for the development of national economies. HPQ management is interpreted in a broad context, including social and economic, health and education policies, as well as financial and investment policies. The EU NUTS (Nomenclature of Units of Territorial Statistics) classification of regions is an example of the use of regional typologies to justify management decisions. Assigning a region to one of the groups gives it the right to receive appropriate EU support according to the identified problems.

The main task of the discriminant analysis is to search for classification functions and to build on their basis the groups of objects classified according to a certain feature. In this study, we use the HPQ feature. The analysis results in assigning each object of observation (region of Ukraine) to only one classification group. The discriminatory analysis is aimed at revealing the difference between the classification groups and defining the patterns characterising the objects of a certain group. All calculations made and classification used are based on the Mahalanobis metric.

All input data must be standardized in advance. The standardization is performed according to the formula:

$$z_{ij} = \frac{x_{ij} - x_j}{\sigma_j} \quad (1)$$

where:

x_j – mean value of a j -th feature in the data set;
 σ_j – mean square deviation of a j -th feature in the whole set.

The next step of classification is the calculation of the Euclidean metric. Euclidean distance (metric) between two points x_i and x_e is determined by the following formula:

$$d_{ij} = \sqrt{\sum_{i=1}^n (x_{ij} - x_{ej})^2} \quad (2)$$

where:

x_{ij} – value of an i -th attribute of a j -th object
 ($i = 1, \dots, n$);

x_{ej} – benchmark value of an i -th attribute of a j -th object.

It should be noted that a significant disadvantage when classifying an array of objects according to the Euclidean metric is that it does not take into account the relationship between all objects, i.e., the distance between two points is not affected by the position of other points. The Mahalanobis distance takes into account the relations between variables in the model, which determine the multidimensional space. The Mahalanobis distance is determined by the formula:

$$d_{ij}^M = \sqrt{(X - Y)^T S^{-1} (X - Y)} \quad (3)$$

where:

X, Y – attribute vectors;

T – transposition operation;

S – attribute covariance matrix.

A necessary prerequisite for discriminatory analysis is to pre-classify regions by group. For this purpose, the range of values of the calculated Euclidean distance is divided into regular intervals according to the principle: above $(\mu + 2\sigma)$ – extremely low quality; between $(\mu + \sigma)$ and $(\mu + 2\sigma)$ – low; between μ and $(\mu + \sigma)$ – below average; between $(\mu - \sigma)$ and μ – average; between $(\mu - 2\sigma)$ and $(\mu - \sigma)$ – high; below $(\mu - 2\sigma)$ – extremely high quality, where μ is the mean value of the Euclidean distance and σ is the standard deviation of the Euclidean distance. The quality criterion of classification is the Mahalanobis distance calculated as a result of analytical procedures. Other statistical criteria of the model adequacy are Wilks' statistics, as well as the F -criterion, the probability value of the error of variables removal from the discrimination procedure.

DATA AND VARIABLES

Some indicators were selected and the averages calculated for a number of years (2009–2017), as well as their standardization in order to carry out

the analysis. A total of 18 parameters were selected (Table 1).

The model includes an estimated indicator to characterize the possible scope of external migration – migration potential, persons². It is quite difficult to obtain

Table 1. Input values for classification of Ukrainian regions by HPQ level (demographic and valeological component)

Source	Value	Vector
Registration statistics data	– x_4 – average age of the population in regions (years)	disincentives
	– x_5 – demographic burden for population aged 15–64 years (persons per 1,000 people aged 15–64 years) by persons under 15 and over 64 years of age	
Calculation indicators	– x_1 – natural increase/decrease (persons per 1,000 people of present population)	incentives
	– x_2 – migration increase/decrease (persons per 1 million people of present population)	
	– x_7 – fraction of women of fertile age (15–44 years) of the total number of women in the region (%)	
	– x_8 – ratio of marriages to divorces	
	– x_6 – mortality rate of working age persons (5–59 years) per 1,000 people of permanent population of corresponding age	disincentives
	– x_{13} – number of first-time registered cases of population diseases per capita	
	– x_{14} – number of HIV-infected people with a first-time established diagnosis per 10,000 people or present population	
	– x_{15} – number of first-time registered cases of malignant diseases, venereal diseases, active tuberculosis per 1,000 people of present population	
	– x_{16} – number of patients with a diagnosed mental and behavioural disorder (for the first time in their life) as a result of psychoactive substances use (substance dependence disorders) per 1,000 people of present population	
	– x_{17} – number of persons with disabilities at the beginning of the year per 1,000 people of present population	
– x_{18} – number of deaths from self-harm at the age of 0–17 years per 10,000 people of permanent population of corresponding age		
Sample survey data	– x_9 – average monthly energy value of diet per capita ^a according to household estimates (kcal)	incentives
	– x_{10} – average monthly household food expenses per household (UAH)	
	– x_{11} – average monthly household health care expenses per household (UAH)	
	– x_{12} – self-assessment of the health state by household members, share of people who estimated their health as good (%)	
Estimates	– x_3 – migratory potential, persons	disincentive

^a All modern concepts of life in valeology are divided into a substrate (the morphology of organisms based on Lamarck, the oldest and, accordingly, the most developed among the other concepts) of energy and information. The information concept was the last to emerge, but it has undergone rapid development with the aid of cybernetics. The least developed is the energy concept, the ideas of which have origins in physics and chemistry and are difficult to implement in other sciences due to differences in methodology. However, all concepts are of equal value. The energy concept of life sustenance is based on extensive (energy intake into organisms) and intensive (efficiency of its use) principles. The energy value of a person's diet reflects an extensive approach, while the intensive approach is manifested in the energy life sustenance of metabolism, activity and labour processes.

Source: Author's research and summarization.

² Migration potential is determined by quantitative and qualitative characteristics of the adult population, which is characterized by motivational attitudes and a high level of readiness for territorial movements and lifestyle changes.

quantitative characteristics of migration potential, especially at the regional level. We based our research on the results of a modular sample survey on labour migration, which was conducted in Ukraine three times – in 2008 [Derzhavnyi Komitet Statystyky Ukrainy 2013], 2012 [ILO 2013], and 2017 [Derzhavnyi Komitet Statystyky 2017]. One of the modular survey issues was the study of permanent household members' intentions to move abroad for certain reasons indicated in the survey. Among the reasons that we treat as a basis for a long stay abroad and a high probability of not returning to Ukraine are family reunification, search for work and leaving for work, study, family affairs, desire to change the place of residence.

In the regional dimension, the survey indicators did not provide a high-reliability level, so they were generalized on the basis of five economic zones. The results of surveys and, accordingly, the input data for calculation of migration potential absolute values are summarized in Table 2.

Thus, the estimated migration potential indicator is obtained as a share of the corresponding age group of the region's population. In this case, the membership of regions in economic groups is distributed in the surveys as follows: North (Zhytomyr, Kyiv, Sumy, Chernihiv Regions and City of Kyiv), East (Dnipro-

petrovsk, Donetsk, Zaporizhia, Luhansk, Kharkiv Regions), South (Mykolaiv, Odesa, Kherson Regions), Centre (Vinnytsia, Kirovohrad, Poltava, Cherkasy Regions) and West (Volyn, Zakarpattia, Ivano-Frankivsk, Lviv, Rivne, Ternopil, Khmelnytskyi, Chernivtsi Regions).

RESULTS AND DISCUSSION

The methodological section provides some approaches to solving the problem of defining a benchmark. In order to take into account the objective conditions for the formation of quality, all the model indicators were divided into stimulants and destimulants. Accordingly, the benchmarks indicate: for stimulant indicators – the highest values achieved in the regions (according to standardized indicators), and for destimulants – the lowest. First of all, the Euclidean coordinate distance of each region from the benchmark was calculated on the basis of existing data array in order to categorize the dependent variable (quality). The next step was to classify the regions as groups in terms of HPQ level by dividing the range of values into uniform intervals (scaling) and assigning the categories 'high', 'medium', 'below average', 'low' quality. The grouping results are presented in Table 3.

Table 2. Data from sample surveys of external labour migration in Ukraine regarding intentions to leave the country for certain reasons (%)

Indicator	North	Centre	South	East	West
2008					
Percentage of people who planned to move abroad for the purpose of employment, study, return to work, family reunification, marriage, desire to change their place of residence, among the total working-age population	5.9	54.3	18	13.4	54.3
2012					
Percentage of people who planned to move abroad for the purpose of employment, search for work, study, family reunification, due to family affairs, among the total amount of population aged 15–70	11.2	43.5	48.6	10.4	72.0
2017					
Percentage of people who planned to move abroad for the purpose of employment, search for work, study, family reunification, due to family affairs, among the total amount of population aged 15–70	16.0	28.9	65.7	40.8	73.2

Source: Derzhavnyi Komitet Statystyky Ukrainy [2009, 2017], ILO [2013].

Table 3. Hypothetical grouping of regions by HPQ level (demographic and valeological component)

Region	Euclidean distance from the benchmark	Regions belonging to groups by HPQ level
Vinnitsia	9.01	average
Volyn	9.24	average
Dnipropetrovsk	9.55	average
Donetsk	11.50	low
Zhytomyr	9.15	average
Zakarpattia	9.80	average
Zaporizhia	10.99	below average
Ivano-Frankivsk	9.58	average
Kyiv	8.84	high
Kirovohrad	9.95	average
Luhansk	13.46	extremely low
Lviv	8.91	high
Mykolaiv	9.56	average
Odesa	8.14	high
Poltava	10.17	below average
Rivne	10.03	below average
Sumy	11.64	low
Ternopil	10.08	below average
Kharkiv	11.02	below average
Kherson	9.74	average
Khmelnitskyi	9.51	average
Cherkasy	9.33	average
Chernivtsi	10.47	below average
Chernihiv	10.14	below average
City of Kyiv	10.70	below average

Source: Author's research.

Stepwise discriminant analysis (Forward stepwise method) was performed using Statistica 12 software. The dependent is the 'quality' category variable, grouped according to the Euclidean distance criterion,

and the independent variables are all the other indicators. So the model has 14 variables that are statistically significant. The total *F*-criterion characterizes the contribution of all statistically significant variables to discrimination and is equal to 5.13, which is greater than the table value. So, the resulting model is statistically significant. That is what Wilks' λ statistics show as well. Partial *F*-criteria characterize the contribution of the relevant variable to discrimination. The highest value is found in the 'migratory potential' variable (8.54), as well as in 'average age of the population' variable (4.74).

The resulting discriminant classification groups of Ukrainian regions in terms of demographic and valeological HPQ component are characterized by the following results: The group with average HPQ includes 12 regions. There are three regions characterized by high quality, seven regions characterized by below average quality, three regions characterized by low quality. The Luhansk region was classified as a low quality group as it was the only one in the lowest quality group. The percentage of classification correctness in all groups is 100%.

Summarized final results of grouping regions of Ukraine by their HPQ are shown in Table 4, Figures 1 and 2. The cartographic analysis of discriminating groups allows drawing a conclusion about a somewhat limited but nevertheless existing influence of the geographical factor on HPQ development level of the Ukrainian regions.

Results of the analysis indicate uneven distribution and some concentration of regions in groups of average and below average quality. Positive, the regions with high and average HPQ are characterized by larger population numbers in some cases (Fig. 2). Thus, based on the results of discriminant analysis, the classification of regions was clarified and the regions were divided into six groups. In this regard, it should be noted that the discriminant analysis was conducted repeatedly with a selection of various indicators. Thus, when including part of the demographic indicators and several variables characterizing self-assessment of health, household expenditures on nutrition and health care, as well as the energy value of the diet, a homogeneous group with high HPQ was formed including the Western regions of Ukraine and the City of Kyiv. Addition of

Table 4. Classification of regions according to HPQ level (demographic and valeological component), resulting from a discriminant analysis

Classification groups according to HPQ	Regions
High	Kyiv, Lviv, Odesa
Average	Zakarpattia, Ivano-Frankivsk, Vinnytsia, Zhytomyr, Rivne, Cherkasy, Kirovohrad, Khmelnytskyi, Dnipropetrovsk, Volyn, Mykolaiv, Kherson
Below average	Zaporizhia, Poltava, Ternopil, Kharkiv, Chernihiv, Chernivtsi, City of Kyiv
Low	Luhansk, Donetsk, Sumy

Source: Author’s research.

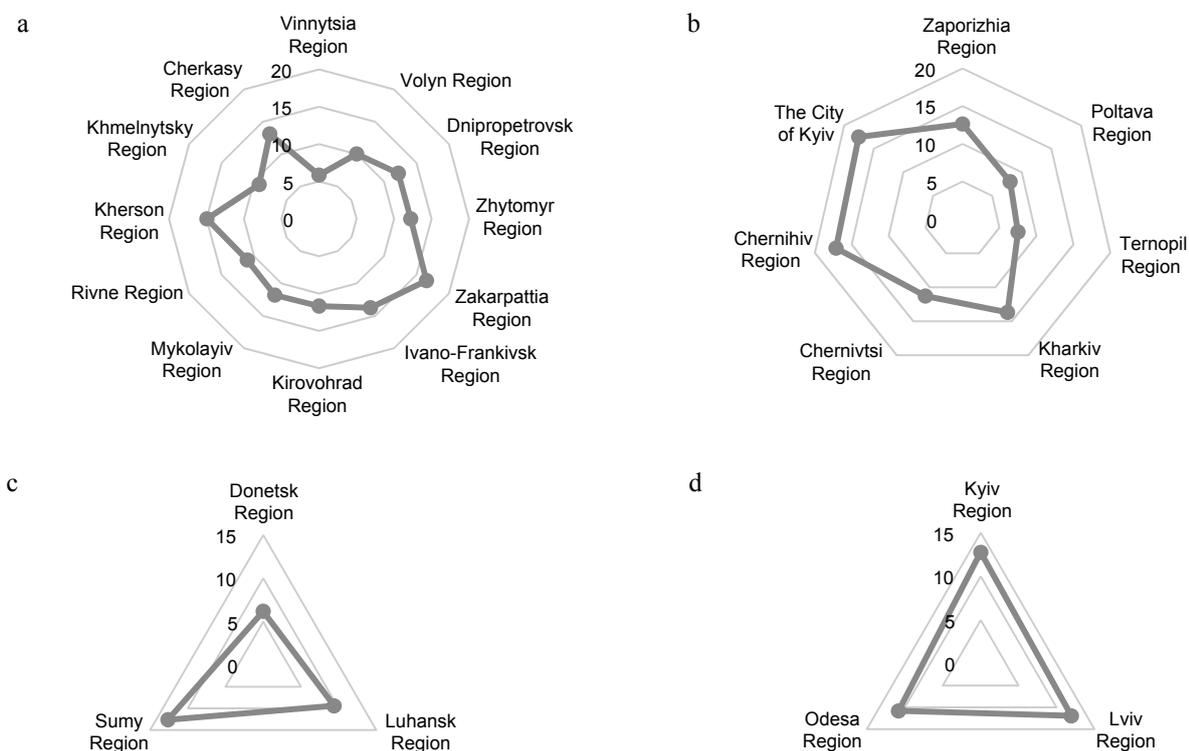


Fig. 1. Discrimination groups and Mahalanobis distances from the centroids of the groups of Ukrainian regions in terms of HPQ level according to the demographic and valeological component: a – average; b – below average; c – low; d – high

Source: Author’s research.

variables to the discriminant analysis, characterizing the state of mental health of the population in the Ukrainian regions, has slightly changed the classification, as well as widened the gap between the groups with low

quality and others. Addition of variables characterizing diseases of the population (in general, as well as certain diseases, including socially dangerous ones) to the list of indicators has made this gap even wider.

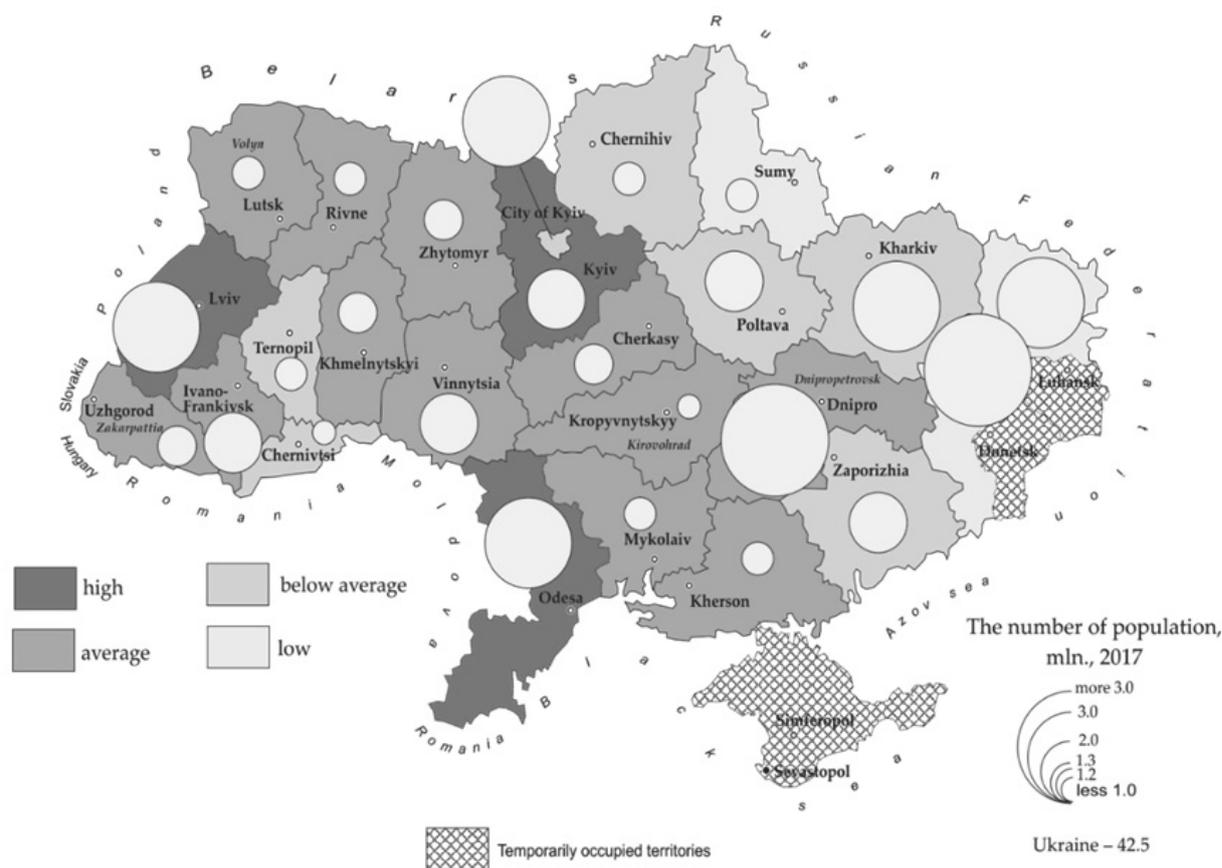


Fig. 2. The level of HPQ development and the population of the regions of Ukraine
Source: Author's research.

It should also be noted that the western region has lost its homogeneity in terms of quality assessment to some extent, as Ternopil and Chernivtsi Region gradually shifted to the lower quality groups, eventually becoming a part of the group with the below average HPQ. The same changes concerned the City of Kyiv, which dropped from the high-quality position to the below average one due to high morbidity rates, HIV infection rates, as well as socially dangerous diseases and malignant formations.

The results of the study are accumulated in the following conclusions. Lviv, Kyiv and especially the Odessa region cannot be called homogeneous regions. However, combining them in one group with a high HPQ is explained by positive indicators of migration growth, which led to a smaller average age of the population, a lower demographic load, a higher fraction of

women of fertile age, a higher ratio of marriages to divorces, higher esteem by the population of their health. At the same time, traditionally higher morbidity rates in the Odessa region did not significantly influence its attribution to this group. It is therefore especially relevant to develop an active migration policy for regions (and countries) that are experiencing demographic difficulties.

At the same time, the regions that fall into the lower than middle groups of HPQ are characterized by deeper processes of both natural and migratory depopulation. This influence is especially noticeable in the Sumy region, which was included in the low quality group along with the regions of the anti-terrorist operation. Other tendencies specific to the Sumy region are low esteem of the population by their health, and the lowest in Ukraine expenses of households for food.

CONCLUSIONS

Thus, the research carried out allows making some generalizations. The demographic and valeological HPQ component in the regions of Ukraine is characterized by a fairly wide list of indicators reflecting the reproductive and migratory potential, demographic and reproductive processes, state and trends in the health of the region residents. Quality as a relative category requires specific approaches to assess its level, so the taxonomic and discriminant analysis methods were used in the research. The latter method provided for the categorization of quality value. As a result of the analytical procedures, the classification groups of Ukrainian regions by HPQ level were obtained. It allowed to achieve the goal of the study – to differentiate Ukrainian regions by one of the HPQ components.

The proposed methodology is based on data that can be obtained from any country's statistics agencies (except for the estimated migratory potential, but it may be available in such indicators). Therefore, the methodology is suitable for analysis and justification of management decisions of different government levels on HPQ conservation and development.

Classification of regions by the level of demographic and valeological HPQ component is only the first step in HPQ comprehensive assessment of Ukrainian regions. Further evaluation should include other components (educational and intellectual, professional and qualificational, social and cultural, moral and ethical, as well as ekistical).

Classification is a prerequisite for creating typologies of the regions according to HPQ development indicators. Typologies offer a higher level of region differentiation, as they provide for a wider inclusion of dynamic and cause-effect relations of HPQ development into the model. For this purpose, it is advisable to investigate the factors forming HPQ (e.g. by the method of main components), as well as signals and mechanisms of the HPQ system response to external challenges and development policy implemented by the authorities and international organizations, as well as other stakeholders. It is also preferable to take into account the asymmetries in the development of the regions according to HPQ characteristics.

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ZRÓŻNICOWANIE JAKOŚCI POTENCJAŁU LUDZKIEGO W REGIONACH UKRAINY: ASPEKTY DEMOGRAFICZNE I ZDROWOTNE

STRESZCZENIE

W artykule przedstawiono metodę oceny jakości potencjału ludzkiego we współczesnej Ukrainie poprzez pryzmat komponentów demograficznego i waleologicznego (w tym zdrowego trybu życia). Analizę przeprowadzono na podstawie danych regionalnych. Oprócz pomiaru poziomu rozwoju jakości potencjału ludzkiego metoda ta umożliwia klasyfikację regionów. Taka klasyfikacja stanowi uzasadnienie stosowania polityki regionalnej ukierunkowanej na rozwój człowieka oraz podziału środków między regiony. W badaniu zastosowano analizę dyskryminacyjną, a także wybrane metody analizy taksonomicznej. W wyniku analizy ukraińskie regiony zostały podzielone na cztery grupy. Metoda zastosowana w badaniu jest uniwersalna i może być wykorzystywana do oceny oraz klasyfikacji regionów według innych elementów jakości potencjału ludzkiego pod warunkiem zastosowania odpowiednich wskaźników. Może być również wdrożona w badaniach innych krajów, ponieważ baza danych statystycznych jest dość jednolita pod względem wskaźników wykorzystanych w analizie.

Słowa kluczowe: jakość kapitału ludzkiego, demografia, waleologia, regiony Ukrainy, klasyfikacja, analiza dyskryminacyjna