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DEMOGRAPHIC SITUATION AS AN INDICATOR OF SOCIO-ECONOMIC DEVELOPMENT (ON EXAMPLE OF VOLYN AND KHARKIV REGIONS OF UKRAINE)

Niemiec L., Mielnijczuk M., Segida K., Pogriebskij T. **Sytuacja demograficzna jako wskaźnik rozwoju społeczno-gospodarczego (na przykładzie obwodu wołyńskiego i charkowskiego na Ukrainie).** We współczesnych warunkach przeorientowywania się i kształtowania nowej strategii narodowej, ukierunkowanej na rozwój potencjału ludzkiego w połączeniu z niesprzyjającymi warunkami demograficznymi na Ukrainie, wzrasta rola badań demograficznych. Poszczególne elementy aktualnych procesów demograficznych na Ukrainie kształtowały się w ciągu dziesięcioleci. Społeczny odzew na nowe warunki życia przejawia się w postaci zmian zachowań demograficznych, w spadku liczby urodzeń, w przekształceniu struktury i funkcji rodziny, w nowych poglądach na śluby i stosunki rodzinne. Określenie przeobrażeń demograficznych na Ukrainie w całości i w poszczególnych regionach stanowi poważny problem badań społeczno-geograficznych.

Немец Л., Мельнийчук М., Сегида К., Погребский Т. **Демографическая ситуация как индикатор социально-экономического развития (на примере Волынской и Харьковской областей Украины).** В современных условиях переориентации и формирования новой национальной стратегии, направленной на развитие человеческого потенциала, в сочетании с неблагоприятными демографическими тенденциями в Украине, актуальность демографических исследований общества растет. Отдельные компоненты текущих демографических процессов в Украине были сформированы в течение десятилетий. Общественный резонанс к новым условиям жизни проявляется изменениями в демографическом поведении, в падении рождаемости, в трансформации структуры и функций семьи, в переоценке взглядов на брак и семейные отношения. Определение демографической трансформации в Украине и ее регионах остается серьезной проблемой социально-географических исследований.

Key words: demographic situation, socio-economic development, fertility, mortality, sex-age structure
Słowa kluczowe: sytuacja demograficzna, rozwój społeczno-gospodarczy, , śmiertelność, struktura płciowa i wiekowa
Ключевые слова: демографическая ситуация, социально-экономическое развитие, рождаемость, смертность, половозрастная структура

Abstract

In modern conditions of the reorientation and the formation of a new national strategy, aimed at the development of human potential, combined with unfavorable demographic trends of the reproduction in Ukraine, the relevance of demographic researches of society is increasing. The individual components of the current demographic processes in Ukraine have been formed over decades, before the current political and socio-economic changes. A public reaction to the new conditions of life manifested by changes in the demographic behavior, in a fertility decline, in a transformation of the structure and the functions of family, in the reassessment of views on marriage and family relations. The determination of a demographic transformation in Ukraine and its regions remains a major problem of socio-geographical research.

STATEMENT OF THE PROBLEM

The demographic situation is the result and reflection of socio-economic development, an influential

factor in social development of the country and its national security. The understanding of importance of demographic development and its current problems led to relevance and necessity of demographic studies in the present time. The differentiation of individual demographic processes and specifics in socio-economic development of certain regions determine the necessitates of demographic study in territorial and temporal aspects, which increases the relevance of regional studies. Due to the current regionalization of economic development and regional differences in demographic trends increases the necessity of demographic study on a regional level to identify the specific characteristics, key trends and to develop an effective regional population policy. Regional differentiation of demographic situation in Ukraine is caused by a set of socio-economic, political, environmental and other factors, in regular, long-term or temporary effects on the population change and its qualitative characteristics (NIEMETS et al., 2014; SEGIDA, VASYLEVSKA, POGREBSKYI, 2014).

As a result of the influence of socio-economic and socio-political changes in Ukrainian society, held demographic changes that appear to change the basic demographic indicators, including fertility, mortality, population structure and so on. Territorial differentiation confirms the demographic trends: improvement from east to west of the country (fig. 1). Considering the state as a single system, defining territorial differentiation of demographic situation (as a result of specific conditions and factors), we consider the common and distinctive features of the western and eastern regions of Ukraine, where are observed major differences in demographic terms. For the research were selected Volyn and Kharkiv regions that can be considered as "average" of the regions. This regions do not include the highest and lowest rates but at the same time contain general regional trends (NIEMETS, SEGIDA, POGREBSKYI. 2013).

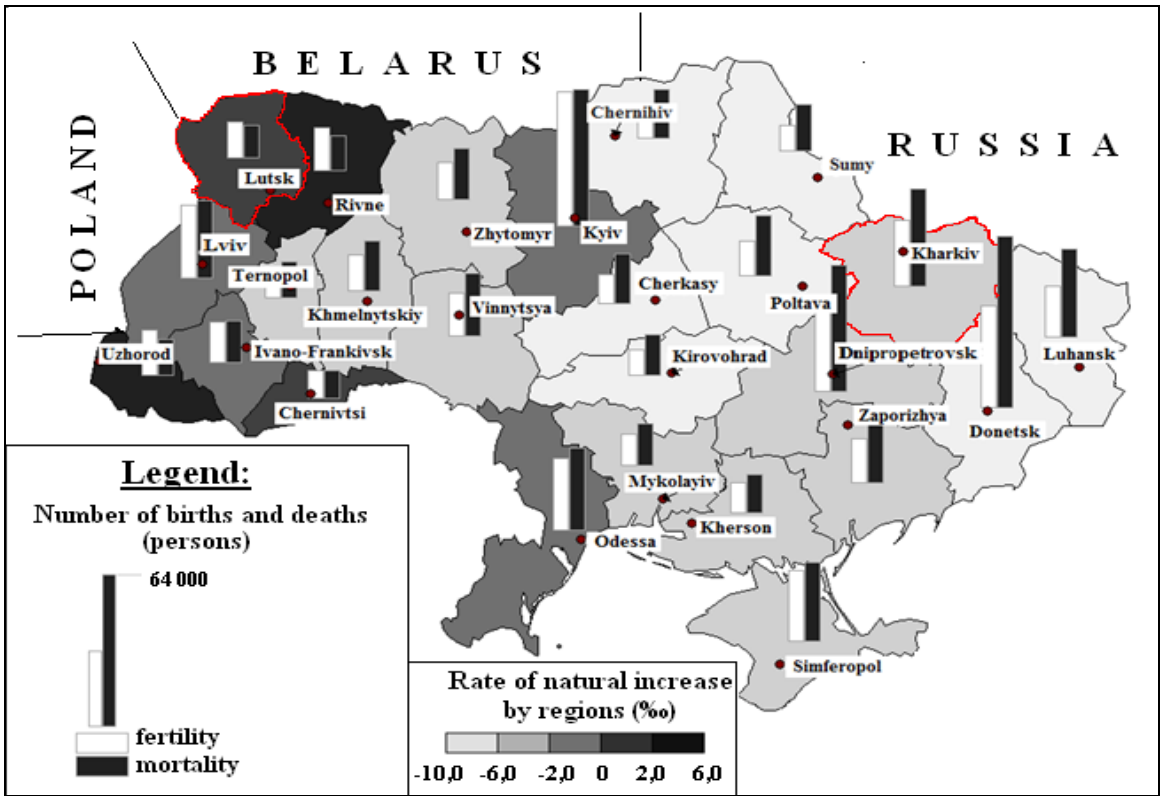

Fig. 1. Natural movement of Ukrainian population in 2012 (from: SEGIDA, VASYLEVSKA, POGREBSKYI, 2014)
Rys. 1. Ruch naturalny ludności Ukrainy w roku 2012 (wg: SEGIDA, VASYLEVSKA, POGREBSKYI, 2014)
Рис. 1. Естественное движение населения Украины в 2012 году (по данным: SEGIDA, VASYLEVSKA, POGREBSKYI, 2014)

Kharkiv region is located in the northeastern Ukraine, has a peripheral position in relation to the capital and geographical center of the country and the border position (borders with the Russian Federation). The total area of Kharkiv region is 5.2% of the country, for this indicator region ranks fourth place among the regions of Ukraine. Modern Kharkiv region is a very powerful economic complex, which in its industrial, scientific, technical and human capacity can be attributed to the largest in Ukraine. Kharkiv region – a major industrial center of Ukraine, which represents almost all economic activities. Regional industry spe-

cialization are engineering, construction materials, gas, light and food industries. Functional and sectoral structure of industry in the region is characterized by a large proportion of heavy industry, in which the main role played by engineering complex. The share of Kharkiv region in 2012 accounted for 6.1% of GDP, for this indicator Kharkiv region holds the 4th place (*Official site Regional State...: http://kharkivoda.gov.ua/*). The population of Kharkiv region is 2 737.2 thousand persons, in the regional center are more than 1.5 million (NIEMETS, SEGIDA, TELEBENEVA, 2014).

Volyn region is located in northwestern Ukraine. Also as Kharkiv region has peripheral position to the capital and geographical center of the country and cross-border position: in the west its border with the Republic of Poland in the north – with Belarus. The total area of Volyn region is 3.3% of Ukraine. The region developed as an agro-industrial, gross industrial output is 1.5% of gross industrial output of Ukraine, and agriculture – 2.5% of gross agricultural output of Ukraine. Industrial production of the region formed on the basis of manufacturing industries – engineering and metalworking, light and food industries (*Official site Regional State...: http://www.voladm.gov.ua/*). The population of Volyn region is 1 041.3 thousand persons, in the regional center – 216 thousand (NIEMETS et al., 2014).

THE AIM AND OBJECTIVES

Accordingly, the goal of the research is an imputation of the study trends of demographic process, definition of structural factors and mechanisms of internal change, definition of causal relationships between demographic and socio-economic situation in Ukraine and its eastern and western regions.

The main objectives of the study:

- an analysis of the dynamics of the total population change of Ukraine and the research regions;
- characteristics of population reproduction in Ukraine and the research regions;
- an identification of structural factors in changes in birth rates of population in Ukraine and the research regions;
- an identification of trends and patterns of mortality causes in Ukraine and the research regions;
- characteristics of the structure of the population of Ukraine and the research regions, the definition of population pressure;
- an identification of the socio-economic conditions and consequences of the demographic situation.

The object of the study are regional differences in the demographic situation in Ukraine.

The subject of research – trends of geodemographic processes in Ukraine, Volyn and Kharkiv regions (as standard western and eastern regions of Ukraine) because of their socio-economic development.

METHODS OF THE RESEARCH

In the current research were used a territorial, dialectical and systemic approaches. Widely used methods of analysis and synthesis, mathematical and statistical techniques and maps, as well as methods of structural and component analysis, standardization and so on.

THE MAIN MATERIAL

General population is affected by its nature and migration reproduction. Current demographic situation in Ukraine is caused not only by low fertility, but also high mortality. However, it should be noted that the above figures in recent years have positive shift, but it is still a natural decline of population. Unlike natural, the migratory reproduction of Ukrainian population is positive, though its volume is much less, therefore the overall decrease in population of Ukraine continues to occur (fig. 2).

In Kharkiv region the migration gain positive value since 2000, the migration of population is a compensatory factor in decrease in the total population of the region (fig. 3). In Volyn region the value of migration change its sign (fig. 4).

In Ukraine there are observed the processes of depopulation. The natural growth in Ukraine in 2013 amounted to -3,5 ‰. We consider in detail the components of this process. The greatest rate of decrease of Ukrainian population was observed in the period 2000–2002 years. Natural growth was -7,6 ‰. (fig. 5). The maximal value this figure reached in 2012 (-3,1‰). Volyn region is one of the 4th regions of Ukraine, where in recent years is observed a positive natural increase (in 2012 – 1,6; in 2013 – 1,0‰) (fig. 6). Kharkiv region has negative indicators: -4,7 ‰ (in 2012 and 2013) (fig. 7). Therefore, we have to note that the rates of natural population movement are significantly different in the western and eastern regions of Ukraine.

The key part of natural movement of population remains fertility. The birth rate in Ukraine in 2012 was 11,4 ‰, in Volyn region – 14,8 ‰, Kharkiv region – 9,9 ‰.

The weightiest endogenous factors of fertility is sex-age structure of the population which varies over time and displays all socio-economic transformation through the lens of demographic development, addressing the main prerequisite for further demographic

development. In addition, the parameters characterizing fertility may depend not only on the factor of age structure, but also on age-specific of fertility intensity (Сегіда, 2010). We determined the value of the actions of each of the structural factors by standardizing of demographic factors (the nature of which is to adjust the actual intensity of index on index of fixed composition), to evaluate the role of various structural factors as in the determination of fertility rates and their changes over time and space.

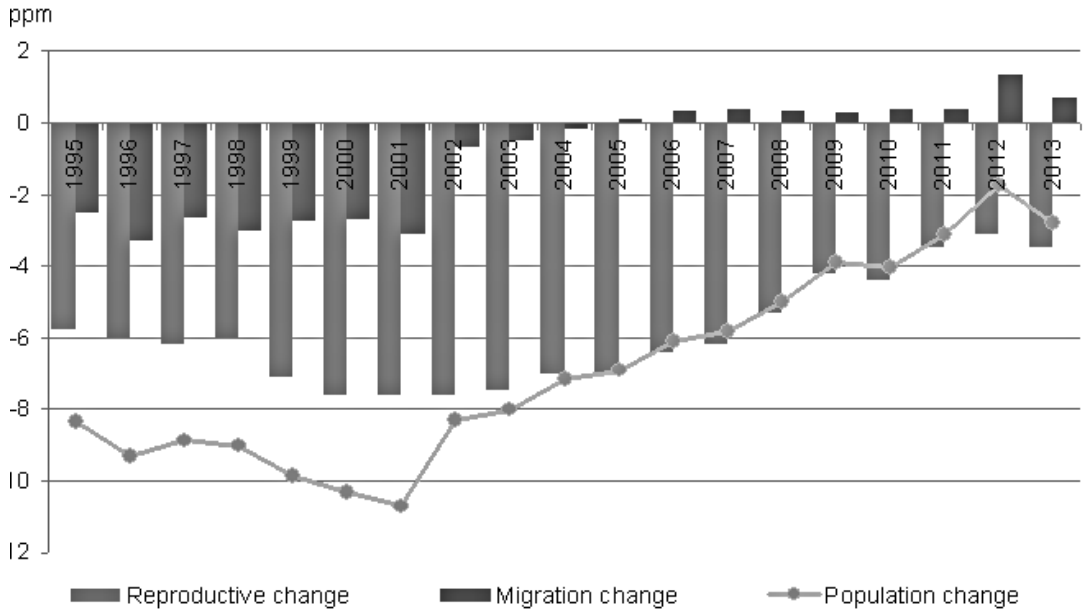

Fig. 2. The dynamics of reproductive and migration population growth in Ukraine during the 1995–2013 (from: *Official site State...: http://www.ukrstat.gov.ua/*)

Rys. 2. Dynamika naturalnych i migracyjnych zmian ludności Ukrainy w latach 1995–2013 (wg: *Official site State...: http://www.ukrstat.gov.ua/*)

Рис. 2. Динамика естественного и механического движения населения Украины в течение 1995–2013 (по данным: *Official site State...: http://www.ukrstat.gov.ua/*)

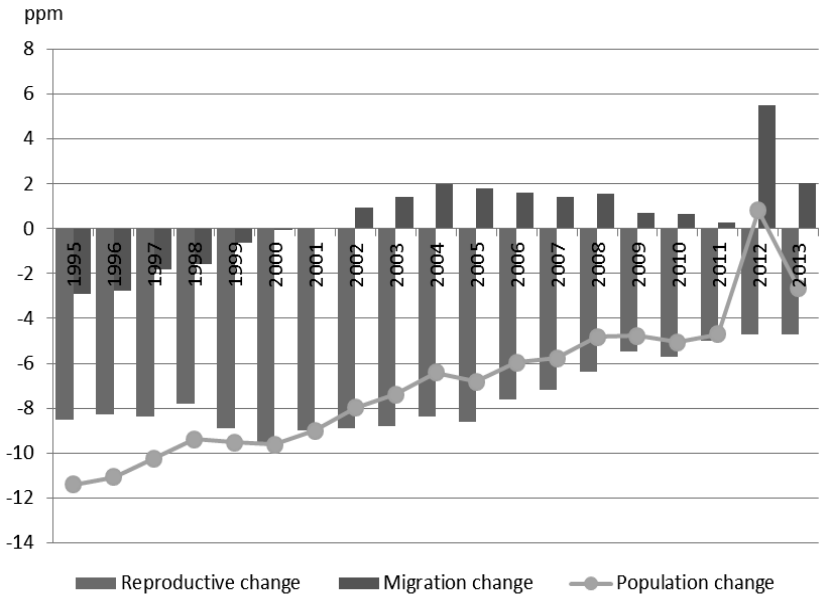

Fig. 3. The dynamics of reproductive and migration population growth in Kharkiv region during the 1995–2013 (from: *Official site Department of State: http://kh.ukrstat.gov.ua/*)

Rys. 3. Dynamika naturalnych i migracyjnych zmian ludności w obwodzie charkowskim w latach 1995–2013 (wg: *Official site Department of State: http://kh.ukrstat.gov.ua/*)

Рис. 3. Динамика естественного и механического движения населения Харьковской области в течение 1995–2013 (по данным: *Official site Department of State: http://kh.ukrstat.gov.ua/*)

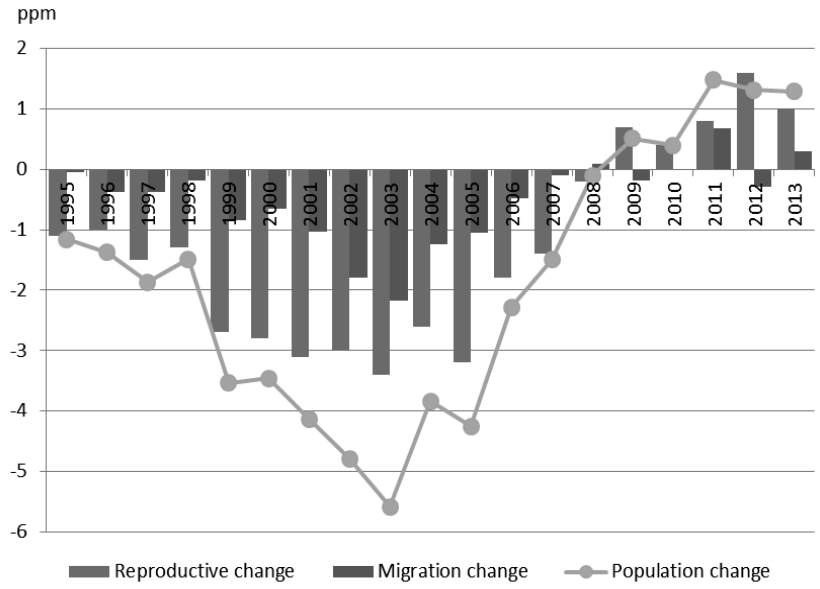

Fig. 4. The dynamics of reproductive and migration population growth in Volyn region during the 1995–2013 (from: *Official site Department of State...: http://lutsk.ukrstat.gov.ua/*)

Rys. 4. Dynamika naturalnych i migracyjnych zmian ludności w obwodzie wołyńskim w latach 1995–2013 (wg: *Official site Department of State...: http://lutsk.ukrstat.gov.ua/*

Рис. 4. *Динамика естественного и механического движения населения Волынской области в течение 1995–2013* (по данным: *Official site Department of State...: http://lutsk.ukrstat.gov.ua/*)

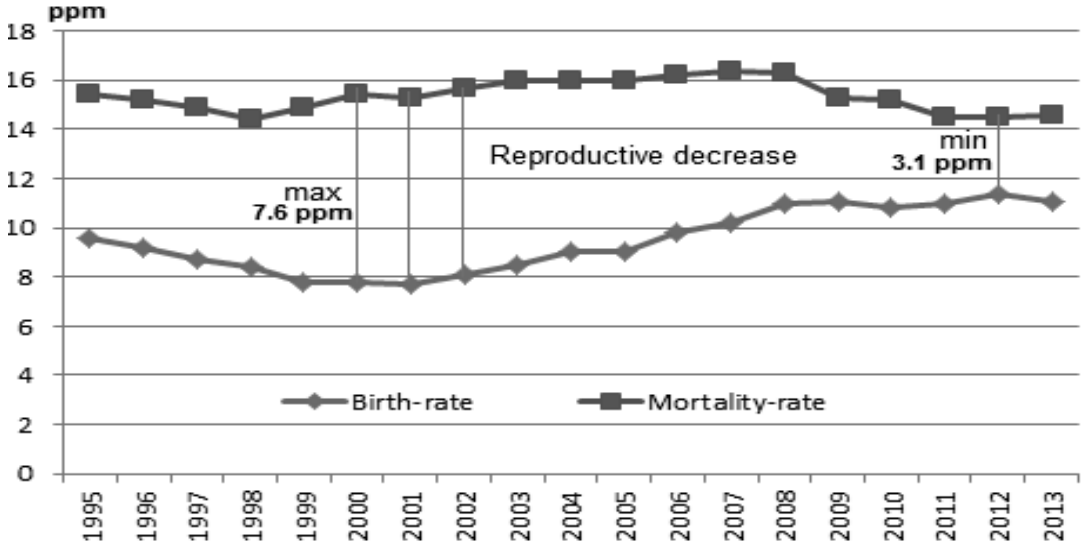

Fig. 5. The dynamics of natural movement of the population in Ukraine during the 1995–2013 (from: *Official site State...: http://www.ukrstat.gov.ua/*)

Rys. 5. Dynamika naturalnego ruchu ludności Ukrainy w latach 1995–2013 (wg: *Official site State...: http://www.ukrstat.gov.ua/*

Рис. 5. *Динамика естественного движения населения Украины в течение 1995–2013* (по данным: *Official site State...: http://www.ukrstat.gov.ua/*)

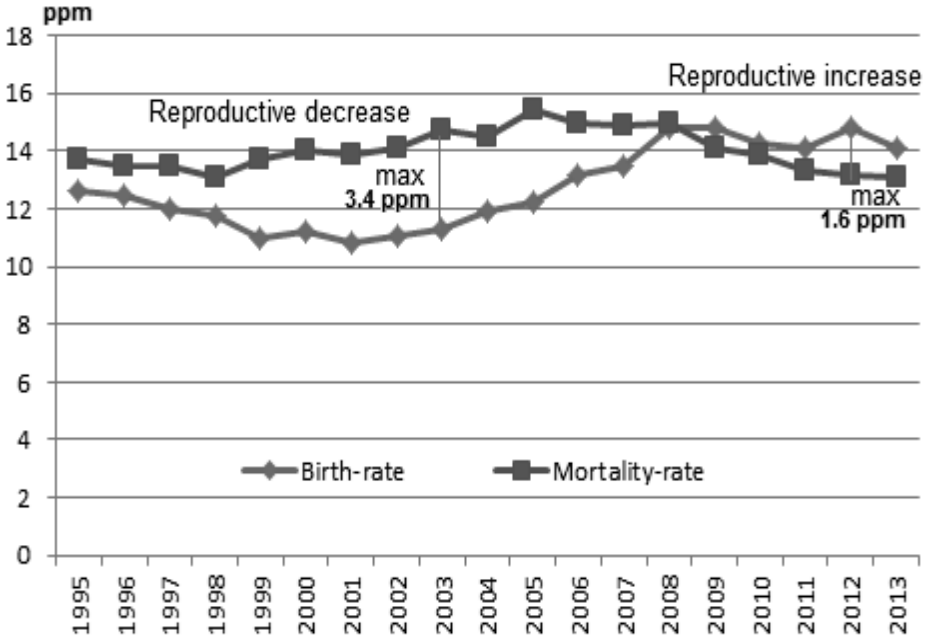

Fig. 6. The dynamics of natural movement of the population in Volyn region during the 1995–2013 (from: *Official site Department of State...: http://lutsk.ukrstat.gov.ua/*)

Rys. 6. Dynamika naturalnego ruchu ludności w obwodzie wołyńskim w latach 1995–2013 (wg: *Official site Department of State...: http://lutsk.ukrstat.gov.ua/*)

Рис. 6. *Динамика естественного движения населения Волынской области в течение 1995–2013 (по данным: Official site Department of State...: http://lutsk.ukrstat.gov.ua/*)

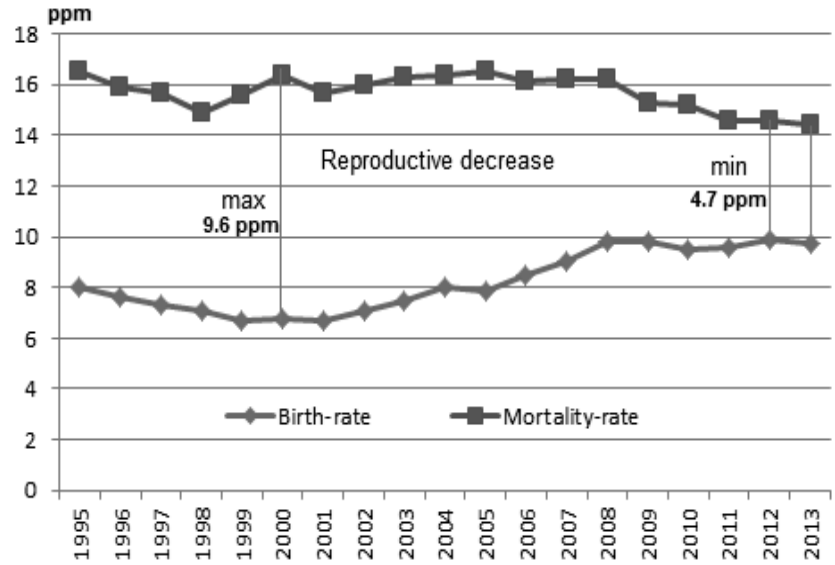

Fig. 7. The dynamics of natural movement of the population in Kharkiv region during the 1995–2013 (from: *Official site Department of State: http://kh.ukrstat.gov.ua/*)

Rys. 7. Dynamika naturalnego ruchu ludności w obwodzie charkowskim w latach 1993–2013 (wg: *Official site Department of State: http://kh.ukrstat.gov.ua/*

Рисунок 7. *Динамика естественного движения населения Харьковской области в течение 1995–2013 (по данным: Official site Department of State: http://kh.ukrstat.gov.ua/*)

To identify and to compare the degree of action of structural factors in fertility process of Ukraine, as well as separately in Volyn and Kharkiv regions, was selected the period from 2001 (the year of the census with stable low rates) to 2012 (the year of sustained birth rates). To calculate the standardized total fertility rate is a necessary input data (table 1).

Table 1. Initial data for calculation of the standardized total fertility rate (compiled from data: *Official site Department of State...: http://kh.ukrstat.gov.ua/; Official site Department of State...: http://lutsk.ukrstat.gov.ua/; Official site State...: http://www.ukrstat.gov.ua/*)

Tabela 1. Dane wyjściowe do obliczenia standaryzowanego ogólnego współczynnika urodzeń (zestawiono wg: *Official site Department of State...: http://kh.ukrstat.gov.ua/; Official site Department of State...: http://lutsk.ukrstat.gov.ua/; Official site State...: http://www.ukrstat.gov.ua/*

Таблица 1. Исходные данные для расчета стандартизированного общего коэффициента рождаемости (составлено по данным: *Official site Department of State...: http://kh.ukrstat.gov.ua/; Official site Department of State...: http://lutsk.ukrstat.gov.ua/; Official site State...: http://www.ukrstat.gov.ua/*)

Ukraine						
Age groups, years	2001			2012		
	Average number of women, people	Absolute number of birth, people	Coefficient of birth, ‰	Average number of women, people	Absolute number of birth, people	Coefficient of birth, ‰
15–19	1869440	54588	29,2	1171202	34433	29,4
20–24	1732074	157099	90,7	1575056	200820	127,5
25–29	1702145	99916	58,7	1899320	210825	111
30–34	1617055	44631	27,6	1726582	130012	75,3
35–39	1829481	16465	9	1660593	55132	33,2
40–44	1992836	3786	1,9	1605955	11402	7,1
45–49	1839642	184	0,1	1635208	818	0,5
Volyn region						
Age groups, years	2001			2012		
	Average number of women, people	Absolute number of birth, people	Coefficient of birth,‰	Average number of women, people	Absolute number of birth, people	Coefficient of birth,‰
5–19	45329	1401	30,9	29 700	873	29,4
20–24	39734	5010	126,1	36 274	4625	127,5
25–29	37490	3119	83,2	44 739	4966	111
30–34	34709	1319	38	41 813	3149	75,3
35–39	35845	505	14,1	37 242	1236	33,2
40–44	41730	121	2,9	35 144	250	7,1
45–49	34014	3	0,1	33 312	17	0,5
Kharkiv region						
Age groups, years	2001			2012		
	Average number of women, people	Absolute number of birth, people	Coefficient of birth,‰	Average number of women,people	Absolute number of birth, people	Coefficient of birth,‰
15–19	115247	2809	24,4	66533	1492	22,4
20–24	107850	8068	74,8	95825	7125	74,4
25–29	104212	5255	50,4	114004	9531	83,6
30–34	97549	2312	23,7	107131	5892	55
35–39	107494	820	7,6	102479	2635	25,7
40–44	124478	175	1,4	98806	459	4,6
45–49	118672	8	0,1	99730	42	0,4

To identify the impact of age-specific fertility rates on changes in fertility during this period by the standard (standard – data that are stable, do not change over time; Сегіда, 2010) were adopted age structure in the first case, and age-specific of fertility rates - in the second. Then calculated standardized general fertility rates for each year so that the total fertility rates based on data standard. If the difference is significant, the degree of influence of age-specific of fertility rates on changes in fertility is significant. Thus eli-

minated the influence of differences in the age structure and fertility differences in different years depend only on the age-specific rate differences of fertility (table 2).

Table 2. The absolute number of births in Ukraine, Volyn and Kharkiv regions with different age-specific of fertility rates and age structure of a single standard (compiled from data *Official site Department of State...: http://kh.ukrstat.gov.ua/; Official site Department of State...: http://lutsk.ukrstat.gov.ua/; Official site State...: http://www.ukrstat.gov.ua/*)

Tabela 2. Absolutna liczba urodzeń na Ukrainie oraz w obwodzie wołyńskim i charkowskim, z różną wiekową specyfiką współczynnika urodzeń i struktury wiekowej (zestawiono wg: *Official site Department of State...: http://kh.ukrstat.gov.ua/; Official site Department of State...: http://lutsk.ukrstat.gov.ua/; Official site State...: http://www.ukrstat.gov.ua/*)

Таблица 2. Абсолютное число рождений в Украине, Волынской и Харьковской областях с различной возрастной спецификой коэффициентов рождаемости и возрастной структуры единого стандарта (составлено по данным: *Official site Department of State...: http://kh.ukrstat.gov.ua/; Official site Department of State...: http://lutsk.ukrstat.gov.ua/; Official site State...: http://www.ukrstat.gov.ua/*)

Age groups, years	Ukraine			Volyn region			Kharkiv region		
	The standard of age structure, people	The absolute number of births at different age-specific of fertility rates and age structure of a single standard, people		The standard of age structure , people	The absolute number of births at different age-specific of fertility rates and age structure of a single standard, people		The standard of age structure , people	The absolute number of births at different age-specific of fertility rates and age structure of a single standard, people	
		2001	2012		2001	2012		2001	2012
15–19	1520321	44393	4697	37515	1159	1103	90890	2218	2036
20–24	1653565	149978	10830	38004	4792	4846	101837,5	7617	7577
25–29	1800732,5	105703	99881	41115	3421	4564	109108	5499	9121
30–34	1671818,5	46142	25888	38261	1454	2881	102340	2425	5629
35–39	1745037	15705	7935	36544	515	1213	104986,5	798	2698
40–44	1799395,5	3419	2776	38437	11	273	111642	156	514
45–49	1737425	174	69	33663	3	17	109201	11	44
Total		365515	52876		1456	14896		18725	27618
$K_{st.}$		7,5‰	14,3‰		0,8‰	14,3‰		6,4‰	0,1‰

For comparison of the factor of influence the intensity of age-structure of fertility and the factor of age structure are taken age-specific rates, which are calculated as the arithmetic average for both periods for each age group (table 3).

We have to note that the degree of influence of age-specific fertility intensities is the highest for Ukrainian population as a whole, a positive value for the population of Kharkiv region, which can be explained by corresponding changes in the urban areas, where fertility rates are traditionally lower, according to the socio-economic improvements in the economy. The increase in the birth rate is observed as a result of implementation of delayed births and late motherhood. For Volyn region the fertility rates are traditionally higher, age-specific fertility intensity is reversed.

Because of differences in the age structure of the population (eg, by reducing the number of women of childbearing age), the total fertility rate for the given period would decrease in Ukraine for 5%, in Volyn region for 20%, in Kharkiv region for 17%.

To confirm the obtained results can be carried out additional calculations (Сегіда, 2010), using as a standard not artificially constructed population but age structure and age-specific fertility rates of 2012. By this time there were already differences in these terms, so they apply to the previous period (2001) (table 4). It is possible to calculate the expected number of births (Сегіда, 2010) provided that the standard adopted by the age structure of women in 2012 and age-specific intensity births in 2001.

As a result of these calculations we obtained the expected birth rate for the population of Volyn region 14‰ (in fact, the birth rate in 2012 was 14‰), Kharkiv region – 10‰ (actually 9,9‰). Due to this calculations for Kharkiv region the key structural factor is the change in age-structure of fertility intensity (corresponding trends of developed countries). For Volyn region a significant impact have measures of geodemographic regional policy, which led to a significant increase in the birth rate.

Table 3. The absolute number of births in Ukraine, Volyn and Kharkiv regions with different age structure and age-specific standards of fertility (compiled from data: *Official site Department of State...: http://kh.ukrstat.gov.ua/; Official site Department of State...: http://lutsk.ukrstat.gov.ua/; Official site State...: http://www.ukrstat.gov.ua/*)

Tabela 3. Absolutna liczba urodzeń na Ukrainie, w obwodzie wołyńskim i charkowskim z różną strukturą wiekową i standardy urodzeń (zestawiono wg: *Official site Department of State...: http://kh.ukrstat.gov.ua/; Official site Department of State...: http://lutsk.ukrstat.gov.ua/; Official site State...: http://www.ukrstat.gov.ua/*)

Таблица 3. Абсолютное число рождений в Украине, Волынской и Харьковской областях с различной возрастной структурой и повозрастные стандарты рождаемости (составлено по данным: *Official site Department of State...: http://kh.ukrstat gov.ua/; Official site Department of State...: http://lutsk.ukrstat.gov.ua/; Official site State...: http://www.ukrstat. gov.ua/*)

age groups, years	Ukraine			Volyn region			Kharkiv region		
	age-specific standards of fertility, ‰	The absolute number of births with different age structure and age-specific standards of fertility, people		age-specific standards of fertility ‰	The absolute number of births with different age structure and age-specific standards of fertility, people		age-specific standards of fertility ‰	The absolute number of births with different age structure and age-specific standards of fertility, people	
		2001	2012		2001	2012		2001	2012
15–19	29,3	54775	34316	30,15	1367	895	23,4	2697	1557
20–24	109,1	188969	171839	126,8	5038	4600	74,6	8046	7149
25–29	84,85	144427	161157	97,1	3640	4344	67	6982	7638
30–34	51,45	83197	88833	56,65	1966	2369	39,35	3839	4216
35–39	21,1	38602	35039	23,65	848	881	16,65	1790	1706
40–44	4,5	968	7227	5	209	176	3	373	296
45–49	0,3	52	491	0,3	10	10	0,25	30	25
Total		19490	498901		13078	13274		23756	22587
$K_{st.}$		10,6 ‰	10,9 ‰		12,3 ‰	12,8 ‰		8,1 ‰	8,2 ‰

Table 4. The expected number of births in Ukraine, Volyn and Kharkiv regions provided by various indicators of age structure and age-specific standards of fertility (compiled from data: *Official site Department of State...: http://kh.ukrstat.gov.ua/; Official site Department of State...: http://lutsk.ukrstat.gov.ua/; Official site State...: http://www.ukrstat.gov.ua/*)

Tabela 4. Oczekiwana liczba urodzeń na Ukrainie, oraz w obwodzie wołyńskim i charkowskim na podstawie różnych wskaźników struktury wiekowej i standardy urodzeń (zestawiono wg: *Official site Department of State...: http://kh.ukrstat.gov.ua/; Official site Department of State...: http://lutsk.ukrstat.gov.ua/; Official site State...: http://www.ukrstat.gov.ua/*

Таблица 4. Ожидаемое число рождений в Украине, Волынской и Харьковской областях, предоставляемых различными показателями возрастной структуры и повозрастные стандарты рождаемости (составлено по данным: *Official site Department of State...: http://kh.ukrstat.gov.ua/; Official site Department of State...: http://lutsk.ukrstat.gov.ua/; Official site State...: http://www.ukrstat.gov.ua/*)

Ukraine								
Age groups, years	Average number of women, people		Coefficient of fertility, ‰		Actual number of births, people		Expected number of births, people	
	2001	2012	2001	2012	2001	2012		
	P_0	P_1	q_0	q_1	P_0q_0	P_1q_1	P_1q_0	P_0q_1
15–19	1869440	1171202	29,2	29,4	54588	34433	34199	54962
20–24	1732074	1575056	90,7	127,5	157099	200820	142858	220839
25–29	1702145	1899320	58,7	111	99916	210825	111490	188938
30–34	1617055	1726582	27,6	75,3	44631	130012	47654	121764
35–39	1829481	1660593	9	33,2	16465	55132	14945	60739
40–44	1992836	1605955	1,9	7,1	3786	11402	3051	14149
45–49	1839642	1635208	0,1	0,5	184	818	164	920
Total	12582673	11273916			376669	643441	354361	662311

Volyn region								
Age groups, years	Average number of women, people		Coefficient of fertility, ‰		Actual number of births, people		Expected number of births, people	
	2001	2012	2001	2012	2001	2012		
	P_0	P_1	q_0	q_1	P_0q_0	P_1q_1	P_1q_0	P_0q_1
15–19	45329	29700	30,9	29,4	1401	873	918	1333
20–24	39734	36274	126,1	127,5	5010	4625	4574	5066
25–29	37490	44739	83,2	111	3119	4966	3722	4161
30–34	34709	41813	38	75,3	1319	3149	1589	2614
35–39	35845	37242	14,1	33,2	505	1236	525	1190
40–44	41730	35144	2,9	7,1	121	250	102	296
45–49	34014	33312	0,1	0,5	3	17	3	17
Total	268851	258224			11479	15115	11433	14677
Kharkiv region								
Age groups, years	Average number of women, people		Coefficient of fertility, ‰		Actual number of births, people		Expected number of births, people	
	2001	2012	2001	2012	2001	2012		
	P_0	P_1	q_0	q_1	P_0q_0	P_1q_1	P_1q_0	P_0q_1
15–19	115247	66533	24,4	22,4	2812	1490	1623	2582
20–24	107850	95825	74,8	74,4	8067	7129	7168	8024
25–29	104212	114004	50,4	83,6	5252	9531	5746	8712
30–34	97549	107131	23,7	55	2312	5892	2539	5365
35–39	107494	102479	7,6	25,7	817	2634	779	2763
40–44	124478	98806	1,4	4,6	174	455	138	573
45–49	118672	99730	0,1	0,4	12	40	10	47
Total	775502	684508			19446	27171	18003	28066

Another important factor, in addition to reducing the birth rate, which effects on the natural decline of population is mortality. In conditions of the intensification of destructive processes in the social life of Ukraine deepened the crisis of public health. The main manifestations of this crisis are the consistently high level of mortality and adverse changes in the structure of death causes. The polarization of Ukrainian society caused by significant gap in material provision of certain groups: income, financial savings, ownership, size and quality of accommodation. Profound disparities in the incomes of the population, increasing unemployment and worsening of working conditions adversely affected on the health of the population and performance of its reproduction. Unfavorable trends in the organization of public health explains by typical for the end of XX century patterns of morbidity and death causes. High mortality from endogenous diseases (cardiovascular disease, cancer) coexists with high levels of mortality from exogenous causes (infectious and parasitic diseases, diseases of the respiratory and digestive system, external causes) (NIEMETS L., SEGIDA K., NIEMETS K., 2012; NIEMETS et al., 2014; SEGIDA, VASYLEVSKA, POGREBSKYI, 2014).

Trends of the dynamics of death causes structure compared to 2005 for various reasons are the same for population of Ukraine and Volyn region and are characterized by an increase in the proportion of cardiovascular diseases (from 62% to 63% and from 61% to 68% respectively), decrease in the proportion of respiratory diseases (from 3,6% to 2,5% and from 8,7% to 4,9% respectively). For the population of Kharkiv region most constant fraction of mortality due to cardiovascular diseases by 70%. In all regions, as in Ukraine as a whole, is observed an increase in the proportion of deaths from neoplasms (1% for the population of Volyn region, 2% for the population of Ukraine, 5% for the population of Kharkiv region). These trends confirm the structure of death causes in industrialized regions.

Birth rate, death rate and migration over a period of time interval leading to changes in population size and its structure, making qualitative changes in individual demographic characteristics, and in general reproduction of the population. As a result, by the end of a period forms new sex-age structure, which depend on quantitative and qualitative characteristics of the reproduction process in the near future (СЕПДА, 2011). One of the most important factors that determine the mode of reproduction, including fertility and mortality, is sex-age structure of the population. Sex-age structure is considered as an endogenous factor of

economic development. In our view, this approach is justified. Interdependence mode of reproduction and sex-age structure of the population indicates the presence of interdependencies.

Modern sex-age structure of Ukrainian population and its demographic characteristics formed by many historical and socio-economic changes in society and through them can be traced the demographic past and future. Contour of sex-age pyramid of the population of Ukraine (SEGIDA, VASYLEVSKA, POGREBSKYI, 2014) corresponds to the regressive population age structure, characterized by a predominance proportion of parents over the proportion of children, leading to population decline.

So, population structure is a factor and the result of demographic development. It is forming the basis of employers resource potential, respectively – of economic development. As a generalized category of sex-age structure of the population can be considered demographic burden, which is defined as a generalized quantitative characteristics of the age structure (СЕГІДА, 2011; SEGIDA, VASYLEVSKA, POGREBSKYI, 2014) and shows the load on the society and economy of non-productive population.

Analysis of population pressure coefficients in Ukraine (table 5) indicates the presence of significant variation caused by significant differences in sex and age structure of the population. In particular, the maximum overall rate of population pressure generation of parents exposed to the female population, with those in Kharkiv region it is higher than in Volyn region (1176‰ and 1127‰, respectively). The maximum value of the coefficient of population pressure by children is observed in Volyn region (386 ‰), which is a result of positive changes in the structure of fertility. One of the main demographic problems is the aging of the population, which is shown through the growing of the share of elderly population. This process is driven by a decline in birth rates and rising of life expectancy (СЕГІДА, 2011). For estimation of the level of aging of population uses the aging factor, which is calculated by comparing the older age groups (65 years and older) with a total number of population (NIEMETS L., SEGIDA K., NIEMETS K. 2012). For Ukraine, the aging factor is 15% (for men – 11% women – 19%); Volyn Region – 13% (for men – 9%, women – 16%); In Kharkiv Region – 15% (for men – 11%, women – 19%). Thus, the male population is characterized by the beginning of demographic aging (scale interval of 10%) for the female population this process is inherent. The share of children in the sex and age structure of the population of Ukraine (0–14 years) is 15%, in the Volyn region – 19%, in Kharkiv Region – 13%. Accordingly, the degree of regressive age structure significantly higher for the female population than the male.

Table 5. Coefficients of population pressure in Ukraine, Volyn and Kharkiv regions, 2013 (compiled from data: *Official site Department of State...: http://kh. ukrstat.gov.ua/; Official site Department of State...: http://lutsk.ukrstat.gov.ua/; Official site State...: http://www.ukrstat.gov.ua/*)

Tabela 5. Współczynniki obciążenia demograficznego na Ukrainie oraz w obwodzie wołyńskim i charkowskim w roku 2013 (zestawiono na podstawie: *Official site Department of State...: http://kh.ukrstat.gov.ua/; Official site Department of State...: http://lutsk.ukrstat.gov.ua/; Official site State...: http://www.ukrstat.gov.ua/*

Таблица 5. Коэффициенты демографической нагрузки в Украине, Волынской и Харьковской областях, 2013 (составлено по данным: *Official site Department of State...: http://kh. ukrstat.gov.ua/; Official site Department of State...: http://lutsk.ukrstat.gov.ua/; Official site State...: http://www.ukrstat.gov.ua/*)

Indicator	Ukraine			Volyn region			Kharkiv region		
	Total	At the same time		Total	At the same time		Total	At the same time	
		Men	Women		Men	Women		Men	Women
$k_{заг} = \frac{S_{0-14} + S_{50+}}{S_{15-49}} \times 1000$	1 021	875	1 165	1012	896	1 127	1 003	833	1 176
$k_{д} = \frac{S_{0-14}}{S_{15-49}} \times 1000$	295	305	285	386	398	374	258	263	253
$k_{п} = \frac{S_{50+}}{S_{15-49}} \times 1000$	726	571	880	625	498	753	745	570	923
$k_{с} = \frac{S_{65+}}{S_{15-49}} \times 1000$	357	236	478	296	189	404	360	234	490
$k_{п/д} = \frac{S_{50+}}{S_{0-14}} \times 1000$	2 462	1 873	3 086	1620	1 249	2 016	2 887	2 165	3 653
$k_{стар} = \frac{S_{65+}}{S_{0-65+}} \times 100$	15	11	19	13	9	16	15	11	19

$k_{дет} = \frac{S_{0-14}}{S_{0-65+}} \times 100$	15	16	13	19	21	18	13	14	12
$k_{ст} = \frac{S_{50+}}{S_{0-65+}} \times 100$	36	30	41	31	26	35	37	31	42

To compare the patterns of population distribution by sex and age should be used the range of frequencies (in this case on the X-axis indicate the middle of the age range or number of groups, and the axis Y – the number or proportion of males and females in each age group) (Сегіда, 2011). Constructed range of frequencies for the population of Ukraine and the research regions (fig. 8–13) indicate the presence of significant differences in patterns of gender and age distribution.

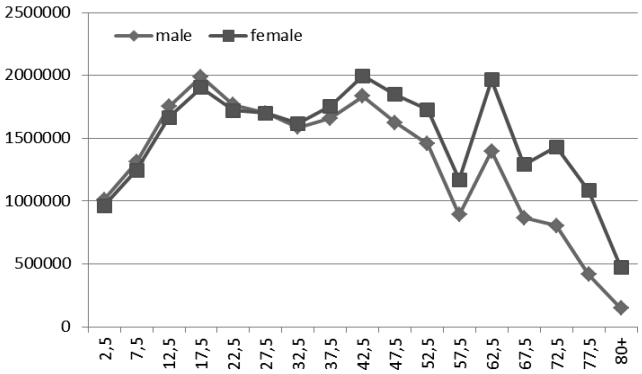

Fig. 8. The range of population distribution by sex and age in Ukraine, 2001 (compiled from data: *Official site State...: http://www.ukrstat.gov.ua/*)
Rys. 8. Ludność Ukrainy wg płci i wieku w roku 2001 (zestawiono wg: *Official site State...: http://www ukrstat.gov.ua/*)
Рис. 8. Диапазон распределения населения по полу и возрасту в Украине, 2001 (составлено по данным: *Official site State...: http://www.ukrstat.gov.ua/*)

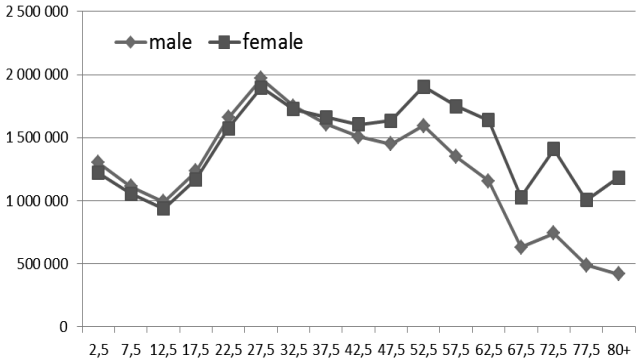

Fig. 9. The range of population distribution by sex and age in Ukraine, 2013 (compiled from data: *Official site State...: http://www. ukrstat.gov.ua/*)
Rys. 9. Ludność Ukrainy wg płci i wieku w roku 2013 (zestawiono wg: *Official site State...: http://www. ukrstat.gov.ua/*)
Рис. 9. Диапазон распределения населения по полу и возрасту в Украине, 2013 (составлено по данным: *Official site State...: http://www. ukrstat.gov.ua/*)

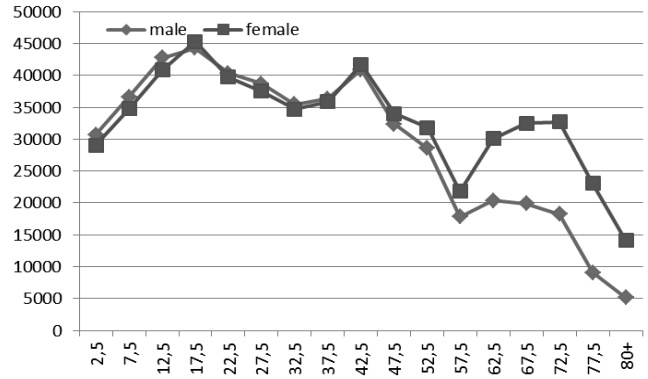

Fig. 10. The range of population distribution by sex and age in Volyn region, 2001 (compiled from data: *Official site Department of State...: http://lutsk.ukrstat.gov.ua/*)
Rys. 10. Ludność obwodu wołyńskiego wg płci i wieku w roku 2001 (zestawiono wg: *Official site Department of State...: http://lutsk.ukrstat.gov.ua/*)
Рис. 10. Диапазон распределения населения по полу и возрасту в Волынской области, 2001 (составлено по данным: *Official site Department of State...: http://lutsk.ukrstat.gov.ua/*)

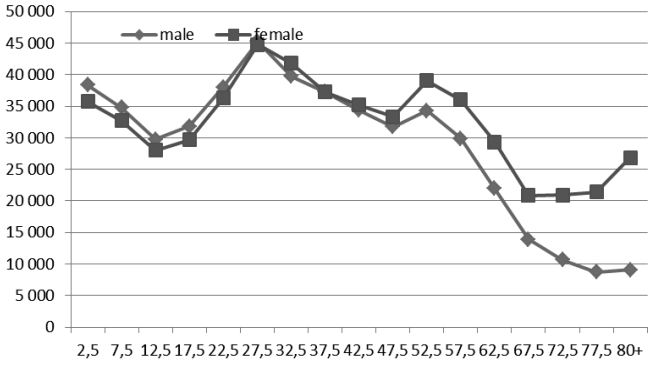

Fig. 11. The range of population distribution by sex and age in Volyn region, 2013 (compiled from data: *Official site Department of State...: http://lutsk.ukrstat.gov.ua/*)

Rys. 11. Ludność obwodu wołyńskiego wg płci i wieku w roku 2013 (zestawiono wg: *Official site Department of State...: http://lutsk.ukrstat.gov.ua/*)

Рис. 11. *Диапазон распределения населения по полу и возрасту в Волынской области, 2013* (составлено по данным: *Official site Department of State...: http://lutsk.ukrstat.gov.ua/*)

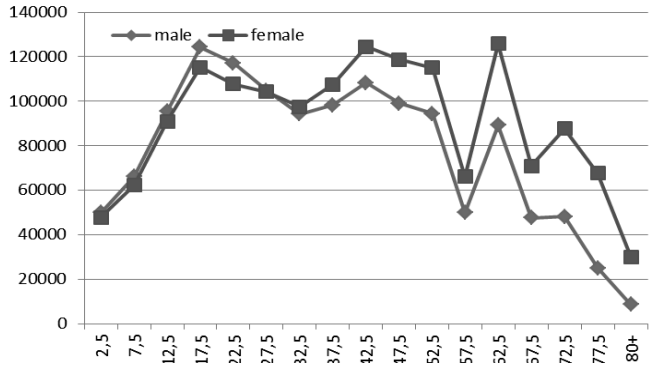

Fig. 12. The range of population distribution by sex and age in Kharkiv region, 2001 (compiled from data: *Official site Department of State...: http://kh.ukrstat.gov.ua/*)

Rys. 12. Ludność obwodu charkowskiego wg płci i wieku w roku 2001 (zestawiono na podstawie: *Official site Department of State...: http://kh. ukrstat.gov.ua/*)

Рис. 12. *Диапазон распределения населения по полу и возрасту в Харьковской области, 2001* (составлено по данным: *Official site Department of State...: http://kh. ukrstat.gov.ua/*))

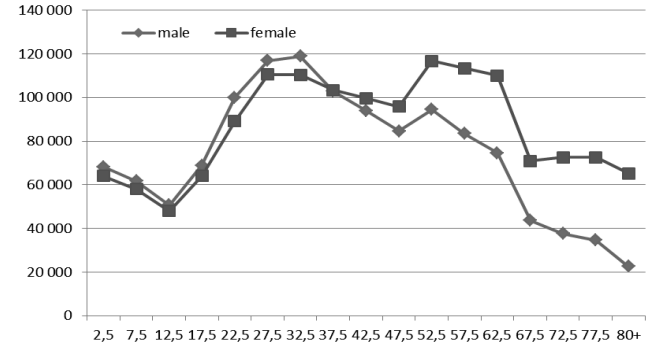

Fig. 13. The range of population distribution by sex and age in Kharkiv region, 2013 (compiled from data: *Official site Department of State...: http://kh. ukrstat. gov.ua/*)

Rys. 13. Ludność obwodu charkowskiego wg płci i wieku w roku 2001 (zestawiono na podstawie: *Official site Department of State...: http://kh. ukrstat. gov.ua/*)

Рис. 13. *Диапазон распределения населения по полу и возрасту в Харьковской области, 2013* (составлено по данным: *Official site Department of State...: http://kh. ukrstat. gov.ua/*)

Thus, the population of Ukraine (fig. 9) is characterized by two distinct "peaks" that match the age range of 25–35, 50–59, due to the phenomena of compensation and amortization. Age balancing (when the number of men and women equalized) are in the range of 30–35 years, after which there is a predominance of women in all age groups. Comparison of the polygons indicates that improvements in population structure, increasing the share of the youngest population (resulting increase in the birth rate) and "equalize peaks" in the older age groups, corresponding to the distribution of mortality by age groups.

The population of Volyn region (fig. 11) is characterized by the same two "peaks", but determined also the third characteristic of the female population of older group, indicating a greater life expectancy in the region, and the fourth – the population under the age of 5 years, which is a consequence of increase in the birth rate. Also, we have to note the long period of age balancing: from 25 to 40 years.

The population of Kharkov region (fig. 13) is characterized by two longer "peaks": 25–35 years, 50–65 years, with a significant difference in terms of age group 10–14 years, whose birth occurred in the 2000s that was the most crisis (Сегіда, 2011; Niemets L., Segida K., Niemets K., 2012). Compared to the sex-age structure of the population of Volyn region, Kharkiv region structure is more regressive and the difference between male and female population in older age groups is more significant, due to, primarily, a higher intensity of mortality of men in these age groups.

Type of population reproduction and the nature of its individual components emerging and developing unevenly in territorial aspect. This dependence is shown not only at the national level, but also within individual regions (Niemets L., Segida K., Niemets K., 2012). Socio-economic conditionality of demographic development most clearly manifested in the cau-

sal nature of the structure. On the one hand, the formation of the population structure in some regions is largely determined by the conditions and intensity of the socio-economic development of the territory, on the other hand, being a socio-demographic categories, demographic structure has a direct impact on the character of reproduction. Also, we have to note the socio-economic conditionality not only of demographic processes, but also the transformation of individual components, including family, generations of family structure, which tends to downsizing. Some authors emphasize the role of socio-demographic factors in the development of this process, demographic and socio-economic effects which are very noticeable (SEGIDA, VASYLEVSKA, POGREBSKYI, 2014).

Demographic development is influenced by a complex set of different factors, mainly of economic and social character. Increasing of the number of factors at the regional level is observed. Relationships started to be more complicated. Therefore, to make the regulatory effect on the course of demographic processes, primarily it is neccesary to identify, to analyze, to select and to systematize the factors and conditions that specifically define the regional demographic development.

CONCLUSIONS

To summarize, we have to note that during the years of independence, the population of Ukraine is rapidly decreasing, which indicates the dominance of certain trends and characteristics of western and eastern regions:

- decrease of the population is caused by natural decline from 1991, main cause of which was a decline of the birth rate;
- birth rate, as a result of political, economic and socio-psychological impact, was decreasing till 2000, followed by a gradual increase, with that, the rate of increase of this indicator, as its value is much higher in the western regions of the state;
- mortality rates have remained stable over the past 15 years that is a reflection of modern age structure, It can be assumed that mortality rate remains at current level: contemporary cohorts of working-age population will move to the older age groups. As a positive factor we have to note tendency of changes in the structure of death causes;
- due to the political stabilization and improvement of the socio-economic situation, since 2000, migratory influx of people is observed, which, on the one hand, reduces decline rate of population due to the natural reduction, on other hand it has a number of negative consequences;
- sex-age structure of population is characterized by an increase in the cohort of young people by increasing of birth rate, has a significant employment potential and even sex ratio of persons in reproductive age, that is creating favorable conditions for further revitalization of demographic behavior of the population, however, this age spread entails considerable demographic pressure in the coming decades;
- modern marriage and family structure is transformed under the influence of changes in attitudes and socio-psychological aspects of demographic behavior. It is characterized by the nuclearization of families and the spread of consensual marriages.

We have to note that the process of reproductive behavior of the population is multifactorial. It is influenced by the deep social and economic changes taking place in society, in particular, the economic crisis, changes in social and psychological stereotypes. A global transformation create a new social situation, emergence of a new human life orientation and values that make significant changes in the demographic behavior of the population and, consequently, in the demographic development of Ukraine.

As already mentioned, the socio-economic conditionality of regional development is most clearly manifested in the causal nature of the population structure. On one hand, the formation of population structure in some regions is largely determined by the conditions and intensity of the socio-economic development of the territory, on other hand, being a socio-demographic categories, demographic structure has a direct impact on the character of reproduction. Thus, complex demographic development and its links with social development emphasize the necessity of regulatory action, to optimize demographic processes in close accordance with the socio-economic development. In particular, the development of social infrastructure in the region, including health care, can't be successful without a thorough analysis of the nature of demographic processes, because on one hand, they are under their influence, on the other – form them. Population serves as a link in social reproduction, functioning in the social scale. Without regulated development of the population is not posible to balance the demographic and economic development, which in turn carries a potential violation of important economic proportions. It is objective necessity of the population study at all hierarchical levels. This necessity is primarily caused by regional differences in the models of natural movement of the population. Research of demographic and economic development can be occur on any territorial-administrative level; but more appropriate is the research for economic

development based on economic conditions at the regional level. Relevant research should consider the following aspects:

- influence of socioeconomic factors on the development of population in the region has a distinct and immediate character, because the relationship between these processes is chronologically closer than in territorial entities of higher rank;
- effects on this processes by administrative and economic management can be carried out with greater efficiency and speed, than at the national level;
- region itself is a complex of territorial entity districts, which have their own peculiarities, in turn, an important subject of grassroots administrative districts research, are the regional centers in the system of administrative and political structure of the country, which have their own governing bodies and management.

Thus, the necessity of management optimization in the region has a certain integrity. Region should be treated as a single socio-economic system. The relationship between demographic and social development is an objective reality, so relevant studies should be carried out taking into account these features. Detection of mechanism in relationship between socio-economic and demographic phenomena has not only theoretical significance, but also can more accurately predict possible changes in demographic processes in the future according to projected changes in economic processes. The analysis of such relationships can improve effectiveness of regional and socio-demographic policies, more effectively predict the system of social and demographic consequences of decisions, especially in unstable socio-economic and demographic development.

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