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2013

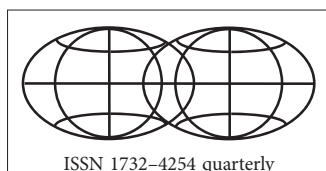MUZEUM HISTORII POLSKI

Rural areas in Poland from a demographic perspective

Jadwiga Biegańska

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Abstract. The article presents an analysis and a critical assessment of rural areas in Poland in the years 1999–2011 from a demographic perspective. The analysis is based on indicators characterising population density, population structure by gender and age, migrations of population, and vital statistics. In order to classify and compare rural areas, the k-means method is employed. The sample of rural areas used in the study contains all 2,173 rural and urban-rural gminas (excluding urban parts) in Poland.

Contents:

1. Introduction

Demographic characteristics are considered today one of the major benchmarks enabling meaningful analyses and predictions of socio-economic developments to be performed. The thorough knowledge of demographic processes and structures allows socio-economic policies to be developed at the national, regional and local levels. Like social structures, also demographic structures have effect on the quality of human resources.

In this article, rural areas in Poland are analysed and critically assessed with respect to changes in their demographic structures and processes that occurred between 1999 (when for the first time in Poland's post-war history the numbers of rural population showed a steady upward trend) and 2011.

2. Research materials and methods

The analysis below is based on data derived from the Local Data Bank of the Central Statistical Office (GUS) and the *'Population Projection for Poland 2008–2035'*, as well as long-term GUS data on all Poland and its rural areas from the years 1946-2010. To ensure data consistency and to avoid conclusions being drawn based on a single year, the mean values of the data were calculated for years 1999-2004 and 2005–2011. The sample of rural gminas taken for analysis included all 2,173 rural and urban-rural gminas (excluding urban parts), totalling 2,173 units (as of 2011) (1).

The indicators used in the course of research were the following: population density (people per sq. km), the dynamics of the number of population (years 2005–2011 in relation to 1999–2004, %), a feminisation rate in the age group 20–34 years, a percentage of the pre-working age population (%), a percentage of the working-age population (%), a percentage of the post-working-age population (%), an ageing index, a parent support ratio, the intensity of population ageing, a birth rate (‰), a general fertility rate, a death rate (‰), natural increase (‰), a rate of demographic dynamics, a rate of migration inflow (‰), a rate of migration outflow (‰), a total migration rate (‰), the index of migration effectiveness. To enable the comparison of Polish rural areas with respect to their specific demographic structures and processes, the areas were classified using the k-means method.

3. Dynamics of the number and density of population

Following 1999, the number of population in rural areas in Poland started rising dynamically and steadily. Earlier on, before 1998, the balance of migration in rural areas had always been negative (due to excess outflows to urban areas). Between 1999 and 2011, rural population increased by almost one million people (6.5%) and its present estimate stands at 15.5 million (cf. Szymańska, Biegańska, 2010). This upward trend is related to a positive balance of migration and a natural increase that is still positive (Szymańska, Biegańska, 2011b). The same trend caused that rural population's share in the total population of the country increased from 38% in 1999 to over 39% in 2011 and it is predicted to reach 41% in 2035 (Population Projection ....).

The positive balance of migration and positive natural increase in rural areas are reflected in the dynamics of population structure and number, and in the building-up process of suburbanisation. The highest dynamics of population growth is observed in the peri-urban areas of large cities (Fig. 1). This trend is positive, because the arriving population (mainly urban) consists of young and well-educated people who stimulate local socio-economic processes, entrepreneurship and creativity, and contribute to better availability of infrastructure and utilities. As a result, multifunctional rural areas are formed in the zones surrounding large cities (Szymańska, Biegańska, 2011b). In the rural, typically farming areas situated far from large cities, the dynamics of the number of population is insignificant (Fig. 1). In eastern Poland, the main source of this phenomenon is outflows of people who seek education and employment opportunities in the services sector in towns and cities. Overall, two trends are marked: outflows of urban population to rural areas and inflows of rural residents to urban areas.

As regards population density, the factors that determine it include the dynamics of the number of population (reflecting the contemporary demographic processes), the characteristics of the natural environment and historical past. In the period in question, population density in rural areas in Poland was around 51 people, but the share of rural gminas where the rate was high (100–200 people per km^2) and very high (>200 people per km^2) was increasing. Compared with the years 1999–2004 when the share was 14.5%, in the period 2005–2011 it was already 15.8% (Table 1). Generally, the most densely populated rural areas in Poland are found in the southern part of the country and in the peri-urban zones of large cities (Fig. 2) (cf. Szymańska, Biegańska, 2012).
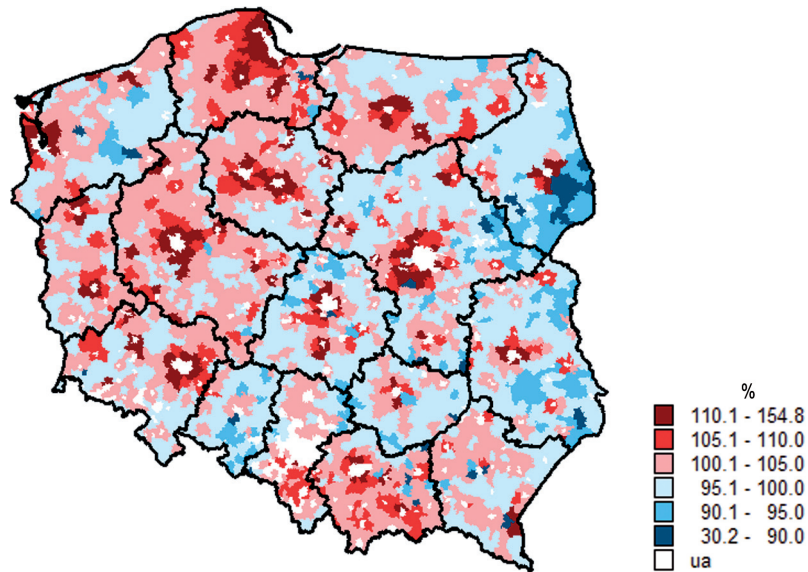
Fig. 1. Dynamics of population number in rural areas in Poland (years 2005––2011 in relation to years 1999–2004; 1999–2004 as 100%)

Source: Own compilation on the basis of data derived from Local Data Bank, Central Statistical Office
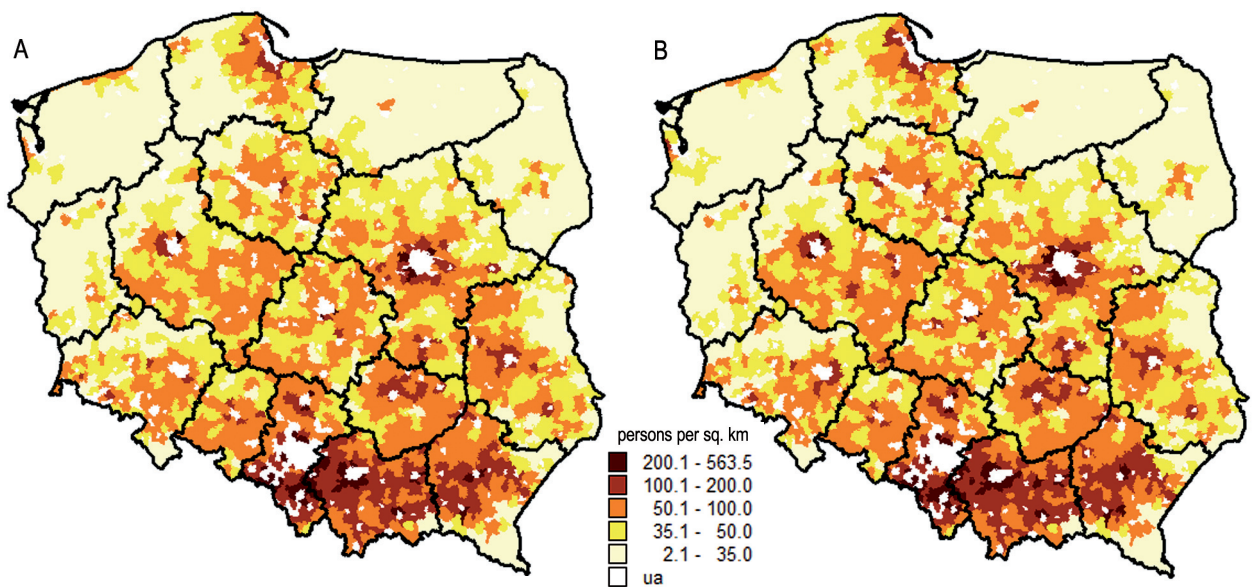
Fig. 2. Population density in rural areas in Poland

Explanation: A – 1999–2004; B – 2005–2011

Source: Own compilation on the basis of data derived from Local Data Bank, Central Statistical Office

4. Population structure by gender and age

Another demographic characteristic investigated in this article is changes in the gender and age structure of populations living in rural areas in Poland.

The most common measure applied to assess the structure of population is a ratio of the number of women to the number of men (a feminisation rate) or the number of men to the number of women (a masculinisation rate). An appropriate proportion between the two rates is important for procreation.

The ratio between women and men living rural areas in the analysed period was 101:100. This relation was advantageous and showed that the population was balanced in gender terms. However, in the age group 20–34 years considered the matrimonial age group the ratio was much less favourable – 97:100. The deficit of women in some gminas was particularly noticeable. In 33% of rural gminas in Po-land there were less than 90 women at matrimonial age per 100 men, and in almost 3% even less than 80 (Table 1, Fig. 3). Spatially, a deficit of women at matrimonial age in rural areas mainly occurs in eastern Poland. As a result, males have less opportunity to find a spouse, the rate of marriages decreases, likewise the number of births (cf. Fig. 10). All these phenomena advance population ageing (cf. Fig. 7–9).
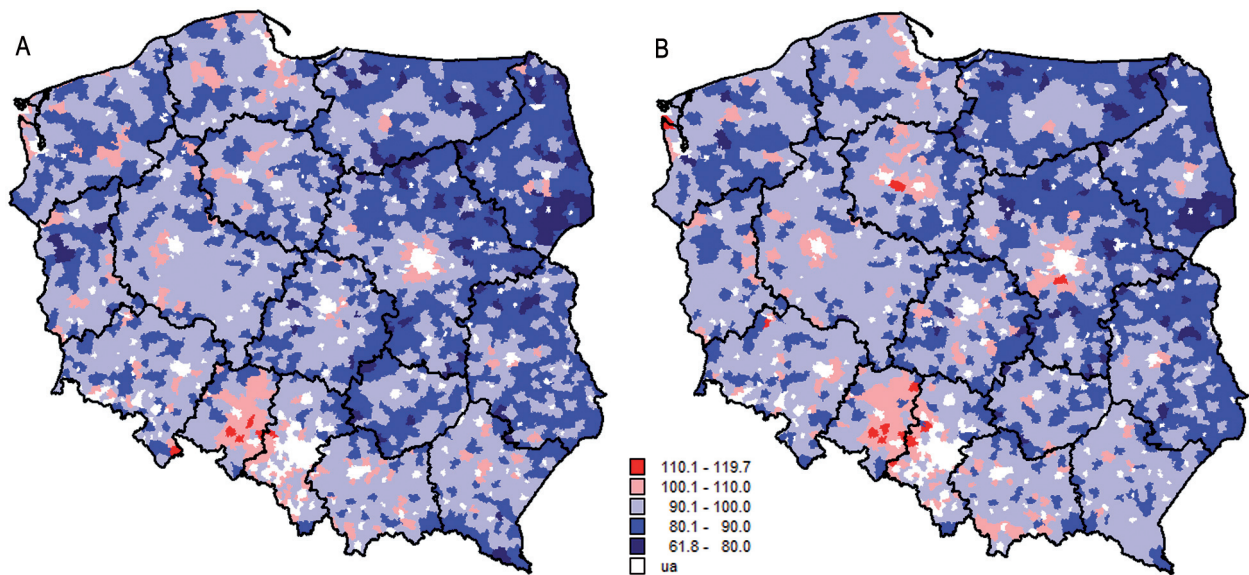
Fig. 3. Feminisation rate at age 20–34 years in rural areas in Poland

Explanation: A – 1999–2004; B – 2005–2011

Source: Own compilation on the basis of data derived from Local Data Bank, Central Statistical Office

The appropriate age structure of population is an important factor in socio-economic development. The age structure also indicates which areas are demographically young and old. In this article, the age structure of population in rural areas is analysed according to three economic age groups, i.e. the pre-working age population (0–14 years), the working-age population (women 15–59 years, men 15–64 years) and the post-working age population (women 60 years and older, men 65 years and older). The working-age population is the actual labour force of the country and the pre-working age population will become one in the future. Depending on its share, it shows whether an area is demographically young or old.

The share of the pre-working age population in rural areas in Poland was decreasing very fast. In the 1950s and 1960s, it exceeded 30%; in the decades of the 1970s, 1980s, and 1990s, it ranged from 20 to 30%; in the period 2005–2011 it dropped to only 18%. The reason was a generally falling number of births, also in rural areas. The shares of the pre-working age population in rural areas show a declining percentage of gminas where they were the highest, in excess 20%. Between 1999–2004 and 2005–2011 the percentage fell from 69.0% to only 9.3% (Table 1). Relatively high rates of the pre-working age population are typical of rural areas in northern and south-eastern Poland (Fig. 4), where populations invariably have more pronatalist attitudes (cf. Fig. 11).
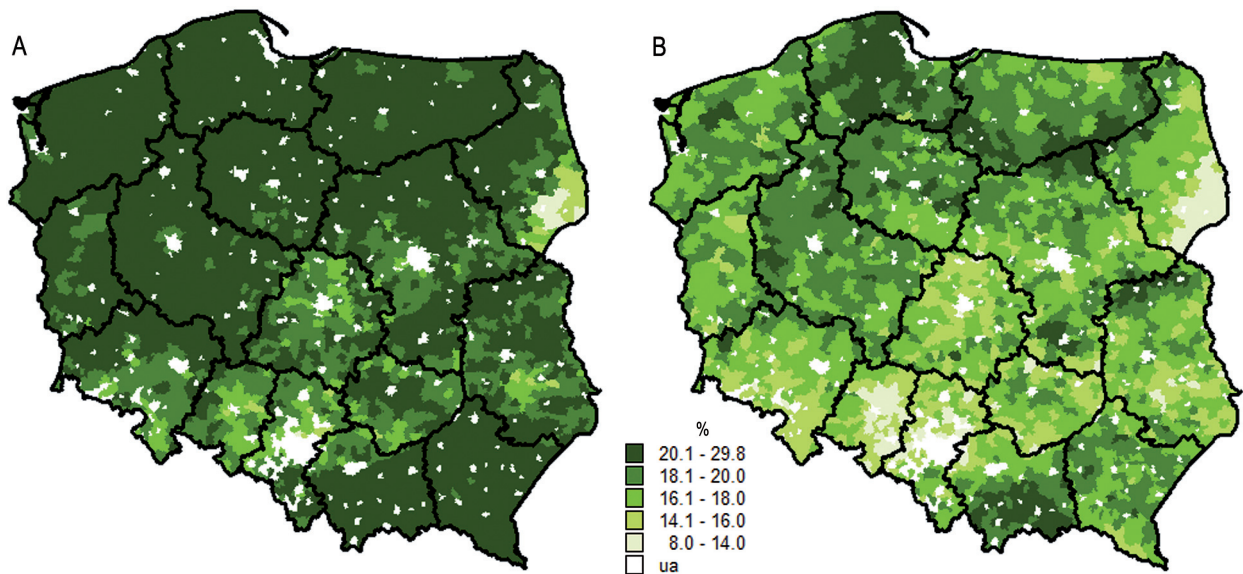
Fig. 4. Share of pre-working age population in rural areas in Poland

Explanation: A – 1999–2004; B – 2005–2011

Source: Own compilation on the basis of data derived from Local Data Bank, Central Statistical Office

In contrast, the share of the working-age population increased in rural areas. In the years 1999–2004, the population accounted for 63% on average, but in the next period, 2005–2011, it was almost 67%. One of the reasons was a new wave of baby-boomers entering this age group. The working-age people are usually economically active, so their greatest shares are found in economically attractive rural areas where labour markets are rich and diverse, e.g. in urbanised areas and in the rural parts of peri-urban areas (Fig. 5).

Fig. 5. Share of working age population in rural areas in Poland

Explanation: A – 1999–2004; B – 2005–2011

Source: Own compilation on the basis of data derived from Local Data Bank, Central Statistical Office

The third age group, i.e. people at retirement age, stood at an average of 15.5% throughout the analysed period. However, the percentage of rural gminas where the rate was the highest (21%) dropped from 9.0% in 1999–2004 to 7.1% in 2005–2011 (Table 1). Spatially, a high share of the post-working age population was typical for several decades of rural areas in eastern Poland (Fig. 6).
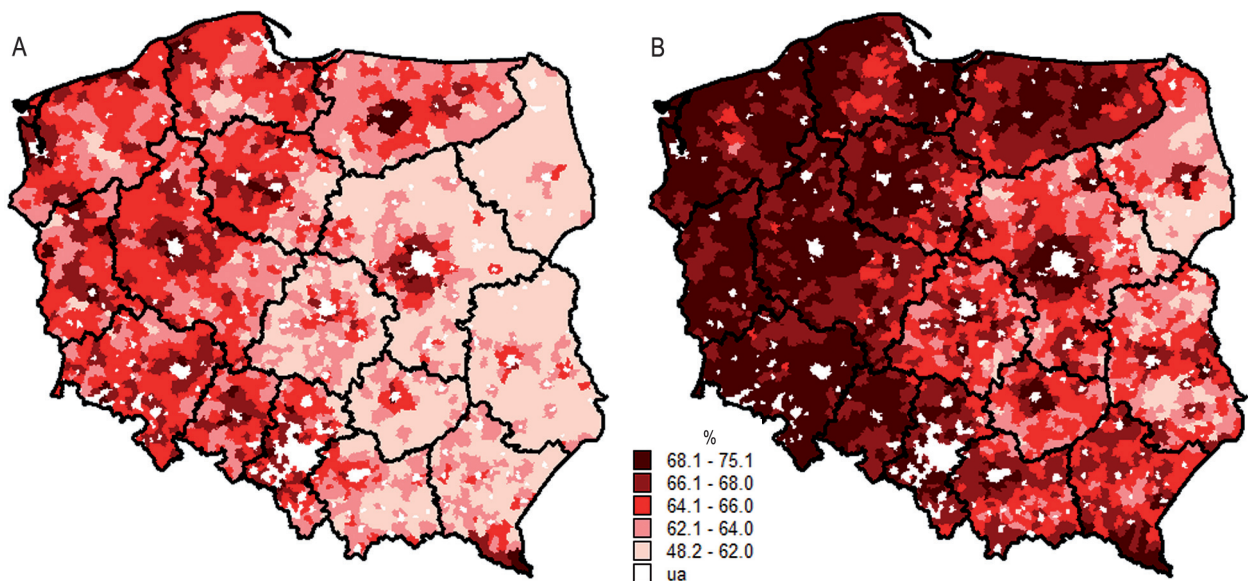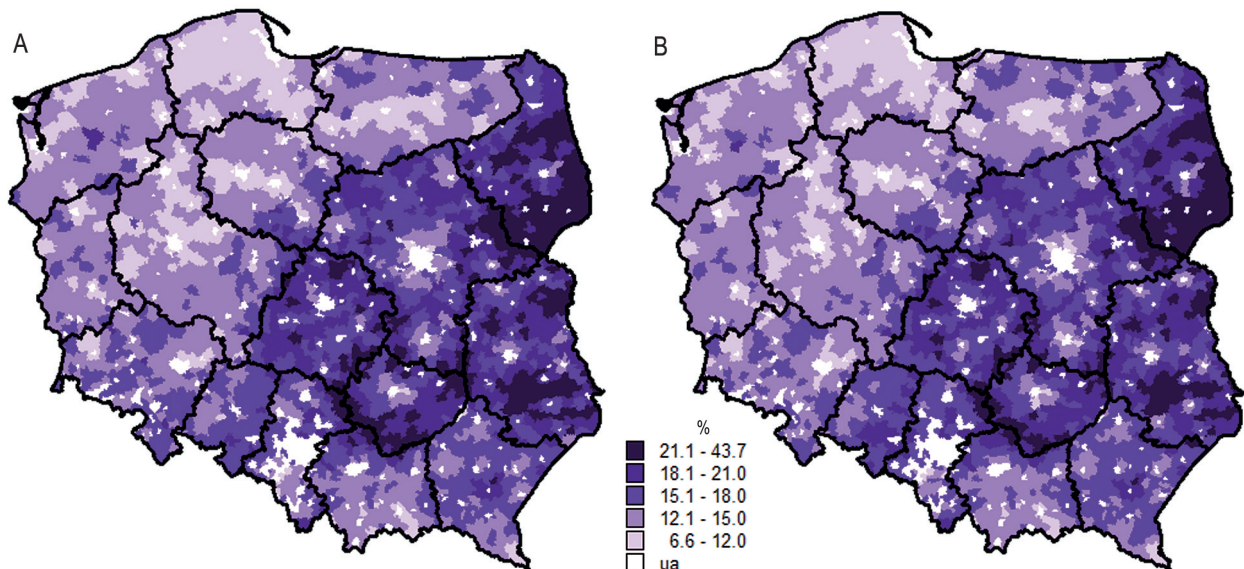

Fig. 6. Share of post-working age population in rural areas in Poland

Explanation: A – 1999–2004; B – 2005–2011

Source: Own compilation on the basis of data derived from Local Data Bank, Central Statistical Office

As far as population age is concerned, there is a range of indicators that enable accurate assessments of the level of demographic ageing and the pace of population ageing.

An analysis of rural areas in Poland based on the ageing index (calculated as a ratio of pre-working age population to post-working age population; cf. Długosz, 2003, 2007) reveals that between 1999–2004 and 2005–2011 the number of people at the post-working age increased from 73 to 87 per 100 pre-working age population, i.e. by 14 people (Table 1).

The parent support ratio (measuring the demands on families to provide support for their oldest-old members) was rising in rural areas from an average of over 6 people aged 85+ per 100 aged 50–64 years in the years 2005–2007 to more than 7 in the period 2008–2011 (Table 1). It is notable that the higher value of the ratio, the more obligations and challenges for the state that has to provide support and care for old people (cf. Kurek, 2008; Łobodzińska, 2011). The assumption underlying the ratio is that older people usually receive care from their families, usually from their children. As the latter have many other responsibilities too, they are sometimes called a 'sandwich generation' to account for the fact they are 'squeezed' between their work, the care of their old parents and the support for their children that are born later and thereby stay longer in the education system (Jóźwiak, Kotowska, www.prezydent.pl…).

Demographic analyses also focus on determining the pace of population ageing. The tool that is used to this end is called the indicator of ageing intensity. It is calculated as a ratio between people aged 80+ and 60+ in the population and shows the oldest-old population as a proportion of all elderly population. Indirectly, the ratio also shows how long old-age benefits are likely to be drawn and the demand for certain healthcare services and various forms of medical care (Łobodzińska, 2011). Its 2005–2007 value calculated for Polish rural areas was 18 oldest-old people per 100 people in the age group 60+, but in the next period, 2008–2011, it was nearly 20 to 100, so it increased by almost 2 people (Table 1).

Table 1. Some characteristics of the population in Poland

Population density (in pers. per sq. km)	I	II	Ageing index	I	II	Natural increase per 1,000 population (‰)	I	II
PL	122.2	122.3	PL	82.5	105.2	PL	0.0	0.5
ua	1115.4	1090.9	ua	89.8	119.7	ua	-0.6	0.2
ra	50.2	51.2	ra	73.4	87.3	ra	0.8	0.9
a			a			a		
200.1-563.5	2.8	3.4	180.1-540.0	0.5	1.2	5.1–12.9	6.8	7.3
100.1-200.0	11.7	12.4	120.1-180.0	4.4	14.9	2.6–5.0	21.4	19.9
50.1-100.0	34.8	33.4	100.1-120.0	10.5	19.0	0.1–2.5	28.3	28.7
35.1-50.0	25.5	25.4	80.1-100.0	24.8	27.8	-2.4–0.0	24.9	24.9
2.1-35.0	25.2	25.4	26.8-80.0	59.8	37.1	-4.9 – -2.5	12.0	12.5
						-19.3 – -5.0	6.6	6.7

Dynamics of population number		Parent support ratio	III	IV	Demographic dynamics rate	I	II
PL	100.1	PL	5.3	6.3	PL	1.0	1.0
ua	99.0	ua	4.6	5.7	ua	0.9	1.0
ra	101.8	ra	6.6	7.4	ra	1.1	1.1
a		a			a		
110.1-154.8	5.9	10.1-22.1	11.4	12.1	1.3-3.0	50.2	49.9
105.1-110.0	8.8	8.1-10.0	17.2	18.5	1.0	12.3	12.6
100.1-105.0	35.1	6.1-8.0	31.0	32.1	0.2-0.9	37.6	37.4
95.1-100.0	42.4	5.1-6.0	17.7	19.1			
90.1-95.0	6.4	1.1-5.0	22.7	18.2			
30.2-90.0	1.4						

Feminisation rate at age 20-34	I	II	Intensity of ageing	III	IV	Total inflow per 1,000 population (‰)	I	II
PL	97.0	97.0	PL	16.2	17.4	PL	10.9	11.8
ua	99.7	99.4	ua	15.1	16.2	ua	9.9	10.3
ra	92.7	93.3	ra	17.9	19.6	ra	12.7	14.1
a			a			a		
110.1-119.7	0.3	0.6	20.1-32.1	24.2	26.1	30.1-73.0	2.1	3.8
100.1-110.0	7.9	8.5	18.1-20.0	25.6	23.3	15.1-30.0	15.6	18.6
90.1-100.0	53.3	55.8	16.1-18.0	26.7	24.5	12.1-15.0	19.3	18.8
80.1-90.0	35.0	32.6	14.1-16.0	15.9	18.5	9.1-12.0	36.5	32.6
61.8-80.0	3.5	2.5	5.9-14.0	7.6	7.6	4.7-9.0	26.5	26.2

Share of pre-working age population (%)	I	II	Birth rate per 1,000 population (‰)	I	II	Total outflow per 1,000 population (‰)	I	II
PL	18.2	15.5	PL	9.5	10.3	PL	11.3	12.1
ua	16.3	14.0	ua	8.6	9.8	ua	11.1	12.4
ra	21.2	17.7	ra	11.0	11.0	ra	11.7	11.7
a			a			a		
20.1-29.8	69.0	9.3	12.1-19.6	27.5	24.9	15.1-40.3	19.0	18.1
18.1-20.0	23.5	31.4	11.1-12.0	22.4	23.6	13.1-15.0	20.5	18.7
16.1-18.0	6.3	39.2	10.1-11.0	21.9	25.5	11.1-13.0	26.8	24.8
14.1-16.0	0.8	16.4	9.1-10.0	15.6	14.6	9.1-11.0	20.5	22.9
8.0-14.0	0.4	3.7	3.6-9.0	12.6	11.5	4.6-9.0	13.2	15.5

Share of working age population (%)	I	II	General fertility rate	I	II	Rate of total migration per 1,000 population (‰)	I	II
PL	66.8	68.3	PL	3.6	4.1	PL	22.3	23.9
ua	69.1	69.2	ua	3.2	3.9	ua	20.9	22.8
ra	63.2	66.8	ra	4.5	4.4	ra	24.4	25.8
a			a			a		
68.1-75.1	2.3	30.5	5.1-8.5	29.6	20.4	35.1-89.7	6.9	9.3
66.1-68.0	10.3	28.5	4.6-5.0	25.8	29.1	30.1-35.0	7.8	9.5
64.1-66.0	24.9	23.6	4.1-4.5	23.8	30.3	25.1-30.0	22.8	22.2
62.1-64.0	25.6	12.4	3.6-4.0	12.4	14.4	20.1-25.0	39.0	32.2
48.2-62.0	37.0	5.0	1.3-3.5	8.4	5.8	9.7-20.0	23.5	26.8

Share of post-working population (%)	I	II	Death rate per 1,000 population (‰)	I	II	Index of migration effectiveness	I	II
PL	15.0	16.3	PL	9.6	9.8	PL	-1.8	-1.4
ua	14.6	16.8	ua	9.2	9.7	ua	-5.8	-9.4
ra	15.6	15.5	ra	10.2	10.1	ra	3.8	9.6
a			a			a		
21.1-43.7	9.0	7.1	14.1-24.9	9.4	9.5	30.1 – 74.1	6.2	8.6
18.1-21.0	17.9	18.2	12.1-14.0	16.9	16.5	10.1 – 30.0	15.2	17.9
15.1-18.0	30.2	32.2	10.1-12.0	27.8	29.0	0.1 – 10.0	16.9	16.4
12.1-15.0	32.5	33.3	8.1-10.0	35.1	34.5	-9.9 – 0.0	21.6	22.7
6.6-12.0	10.4	9.2	4.3-8.0	10.8	11.5	-29.9 - -10.0	34.9	30.7
						-51.8 - -30.0	5.2	3.7

Explanation: a – % of rural gminas within particular bands (N = 2171); PL – Poland; ua – urban areas; ra – rural areas; I – 1999–2004; II – 2005–2011; III – 2005–2007; IV – 2008–2011
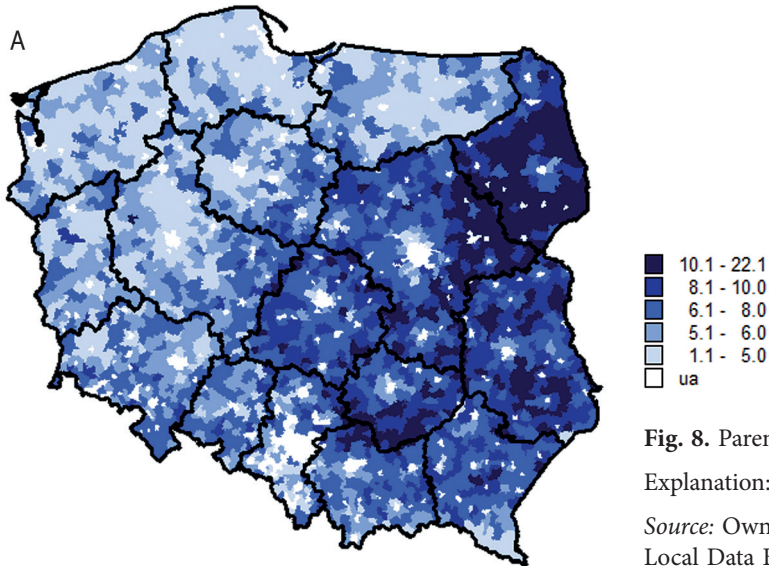
Source: Own compilation on the basis of data derived from Local Data Bank, Central Statistical

A

■	180.1 - 540.0
■	120.1 - 180.0
■	100.1 - 120.0
■	80.1 - 100.0
■	26.8 - 80.0
□	ua
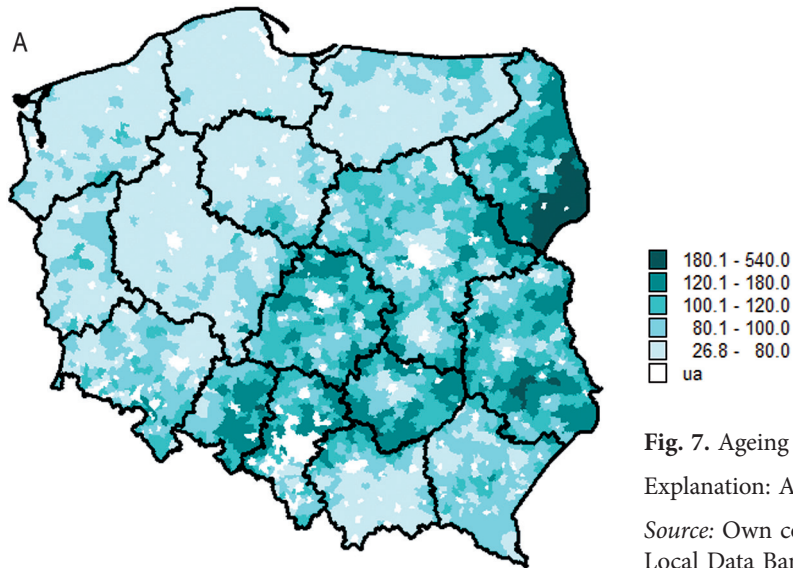
Fig. 7. Ageing index in rural areas in Poland

Explanation: A – 2005–2011

Source: Own compilation on the basis of data derived from Local Data Bank, Central Statistical Office

A

■	10.1 - 22.1
■	8.1 - 10.0
■	6.1 - 8.0
■	5.1 - 6.0
■	1.1 - 5.0
□	ua

Fig. 8. Parent support ratio in rural areas in Poland

Explanation: A – 2008–2011

Source: Own compilation on the basis of data derived from Local Data Bank, Central Statistical Office

A

■	20.0 - 32.1
■	18.1 - 20.0
■	16.1 - 18.0
■	14.1 - 16.0
■	5.9 - 14.0
□	ua
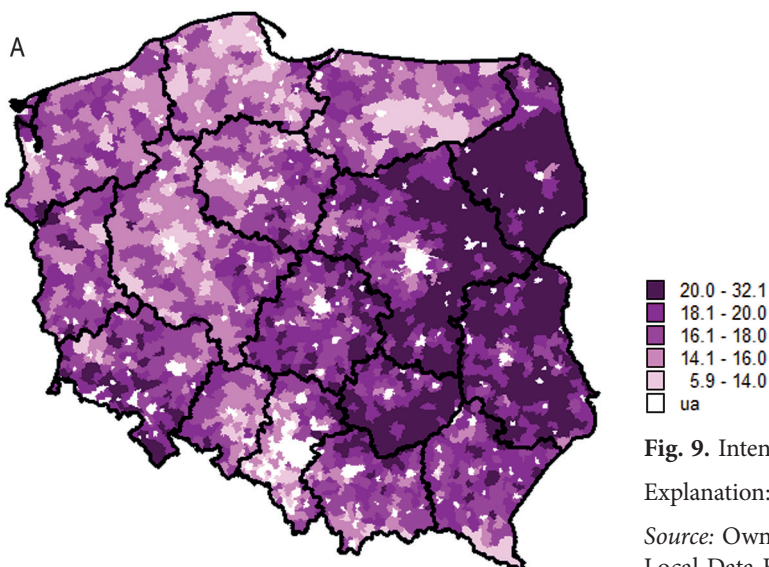
Fig. 9. Intensity of ageing in rural areas in Poland

Explanation: A – 2008–2011

Source: Own compilation on the basis of data derived from Local Data Bank, Central Statistical Office

High values of indicators revealing the level of demographic ageing and the pace of population ageing are mainly observed in eastern Poland (Fig. 7, 8, 9).

5.   Vital statistics

Before vital statistics of population are discussed more at length, let me mention that they consist of the following indicators: a birth rate, a general fertility rate, a death rate, a rate of natural increase, and a demographic dynamics rate.

A rural birth rate of around 11‰ was quite stable in the analysed period (Table 1), despite a small increase in the number of births in rural areas from ca. 161,000 in the years 1999–2004 (the national total was around 365,000) to about 164,000 in the years 2005–2011 (the national total was estimated then at ca. 394,000). A relatively high coefficient of correlation between the average marriage rate and the birth rate (r = 0.5386, α = 0.00) shows that the definite majority of rural children born in the analysed years were legitimate. The number of women at childbearing age had little bearing on the number of births (r = 0.3920, α = 0.00), because of the demographic transition that started in Poland already in the 1990s. One of its impacts is that the birth of the first child is postponed until late reproductive age, which sometimes causes that women do not have any children at all. This seems to explain why Polish rural areas did not attain a rate of 2.1 children per woman at childbearing age (ensuring replacement reproduction), although the number of births slightly increased with the baby boomers reaching their reproductive age (Table 1). High birth rates that are noted today in the rural areas of northern and south-eastern Poland (Fig. 10) arise from high general fertility rates (Fig. 11) (the correlation between the birth rate and the general fertility rate was very high – r = 0.8922, α = 0.00).

Vital statistics consider not only births but also deaths. In all Poland, including its rural areas, mortality was decreasing after 1990s with improving living conditions and better access to medical care (Szymańska, Biegańska, 2012). The number of deaths was quite stable in rural areas in the analysed period and amounted to ca. 150,000, that is 10‰ (the death totals in 1999–2004 and 2005–2011 were, respectively, around 367,000 and 376,000), (Table 1). Rural areas where death rates are high are also characterised by low dynamics of the number of population (cf. Fig. 1), unfavourable age structure (cf. Fig. 4–6) and ageing populations (cf. Fig. 7–9). Most of these areas occur in eastern Poland (Fig. 12).
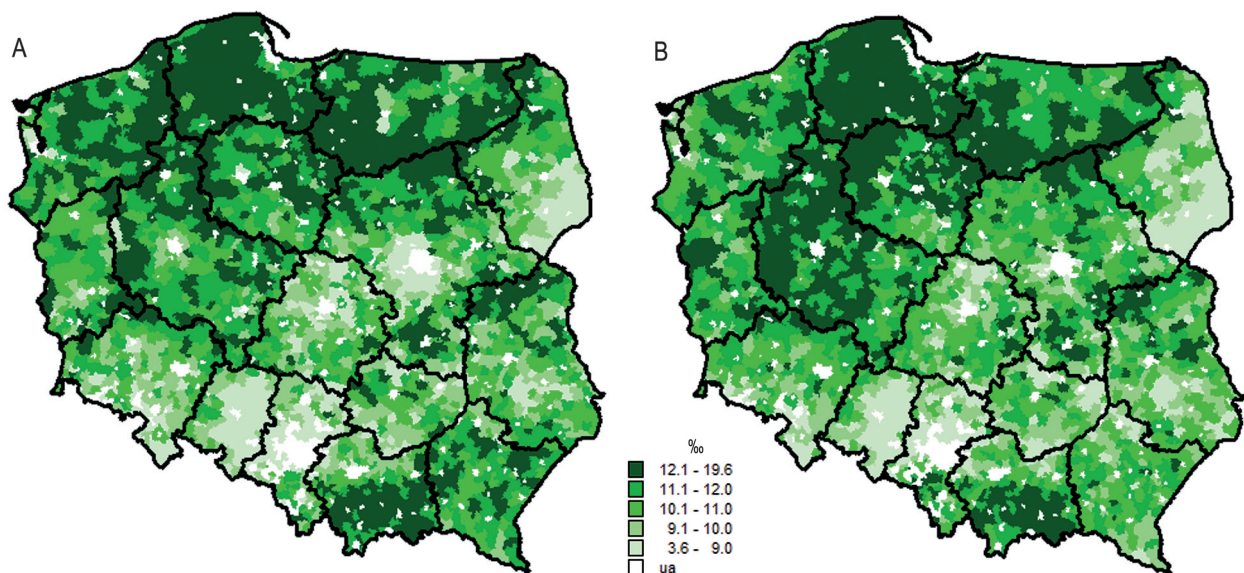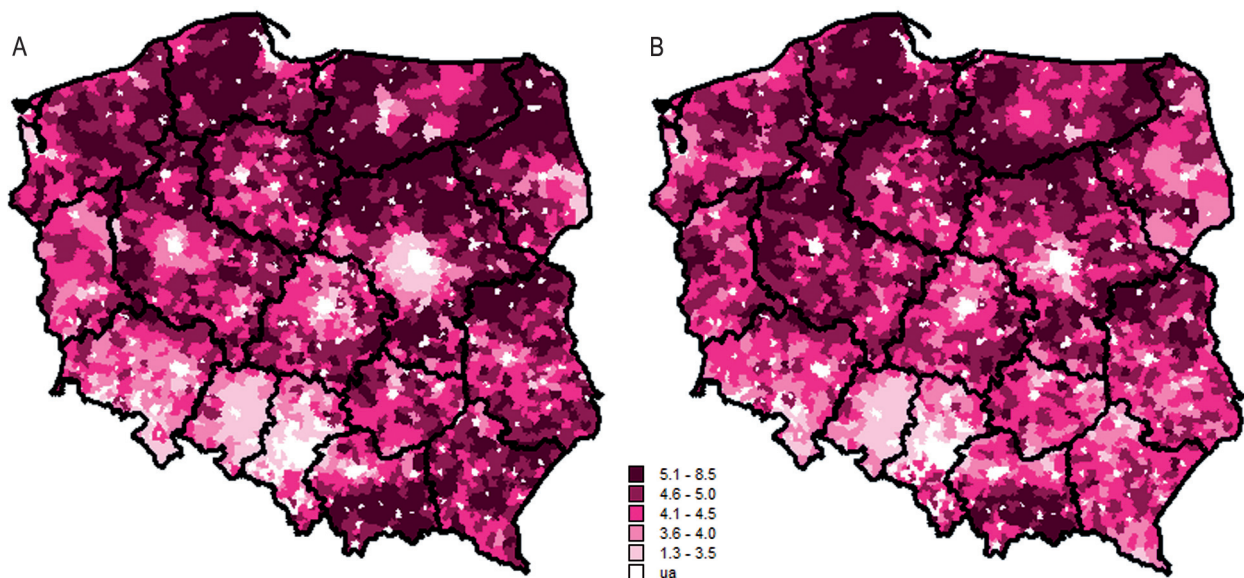

Fig. 10. Birth rate per 1,000 population in rural areas in Poland
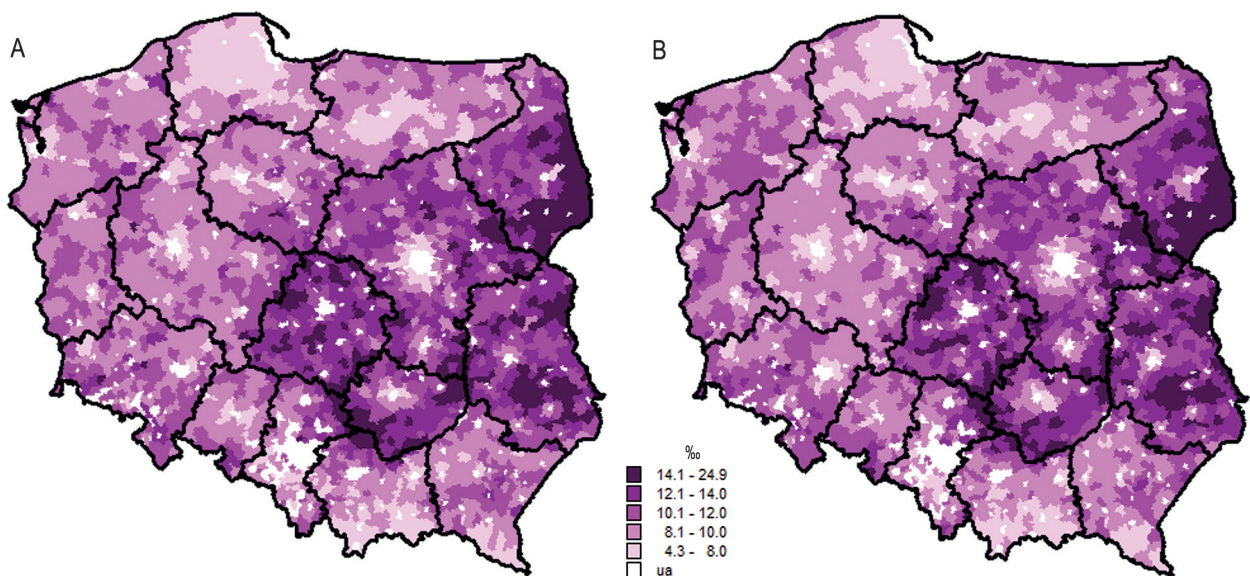
Explanation: A – 1999–2004; B – 2005–2011

Source: Own compilation on the basis of data derived from Local Data Bank, Central Statistical Office

Fig. 11. General fertility rate in rural areas in Poland

Explanation: A – 1999–2004; B – 2005–2011

Source: Own compilation on the basis of data derived from Local Data Bank, Central Statistical Office

Fig. 12. Death rate per 1,000 population in rural areas in Poland

Explanation: A – 1999–2004; B – 2005–2011

Source: Own compilation on the basis of data derived from Local Data Bank, Central Statistical Office

Natural increase is estimated as a function of births and deaths. In the period in question, natural increase slightly rose in rural areas, to 1‰ (cf. Fig. 13), but continued to be low. This fact is particularly noteworthy, because until mid-1980s Poland was in the group of countries where the rates of natural increase were the highest in Europe – the Polish rate of natural increase for rural areas was over 10 times higher than it is today.

Another indicator that can be employed to analyse rural areas is a demographic dynamics rate (i.e. the number of births per death). There are three ranges of values that the rate can take: $0 < W_d(t) < 1$ (below-replacement reproduction), $W_d(t) = 1$ (re-

placement reproduction), $W_d(t) > 1$ (above-replacement reproduction). In the period in question, Polish rural areas were estimated to have the rate at a level of 1.1. Yet, although rural areas continued to have more births and deaths, the demographic dynamics rate decreased considerably (before the early 1990s its rural value was twice as high as it is now).

Above-replacement reproduction and positive natural increase were identified in contiguous rural areas occurring mainly in northern, western and southern Poland. Eastern Poland and large spaces in Opolskie, Śląskie and Dolnośląskie have rural areas characterised by below-replacement reproduction and negative rates of natural increase (Fig. 13, 14).
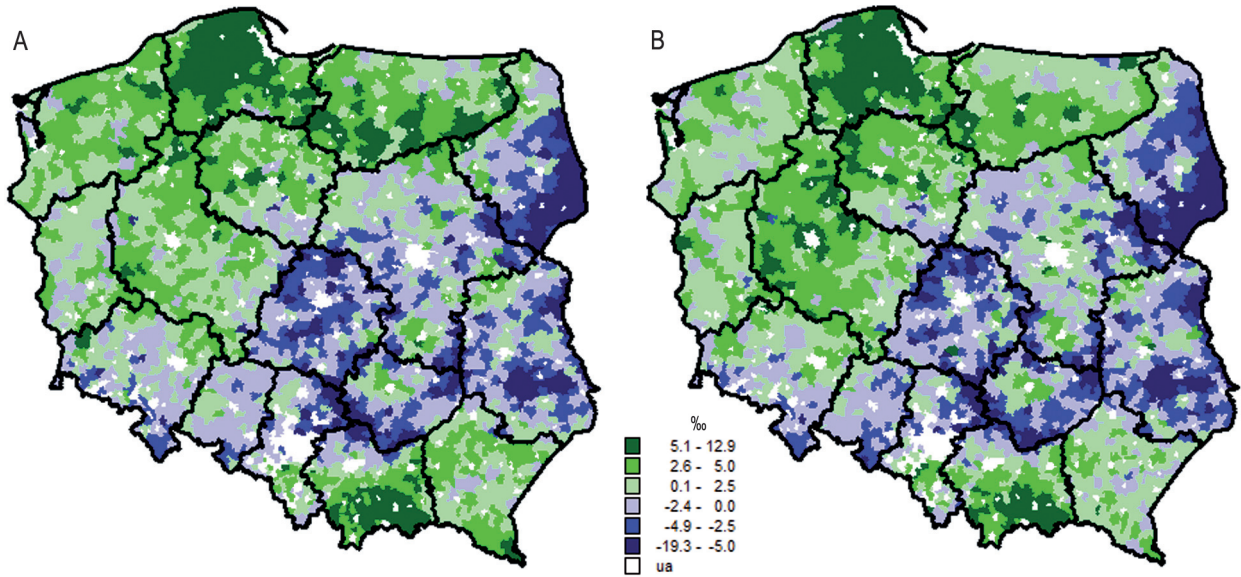

Fig. 13. Natural increase per 1,000 population in rural areas in Poland

Explanation: A – 1999–2004; B – 2005–2011

Source: Own compilation on the basis of data derived from ocal Data Bank, Central Statistical Office
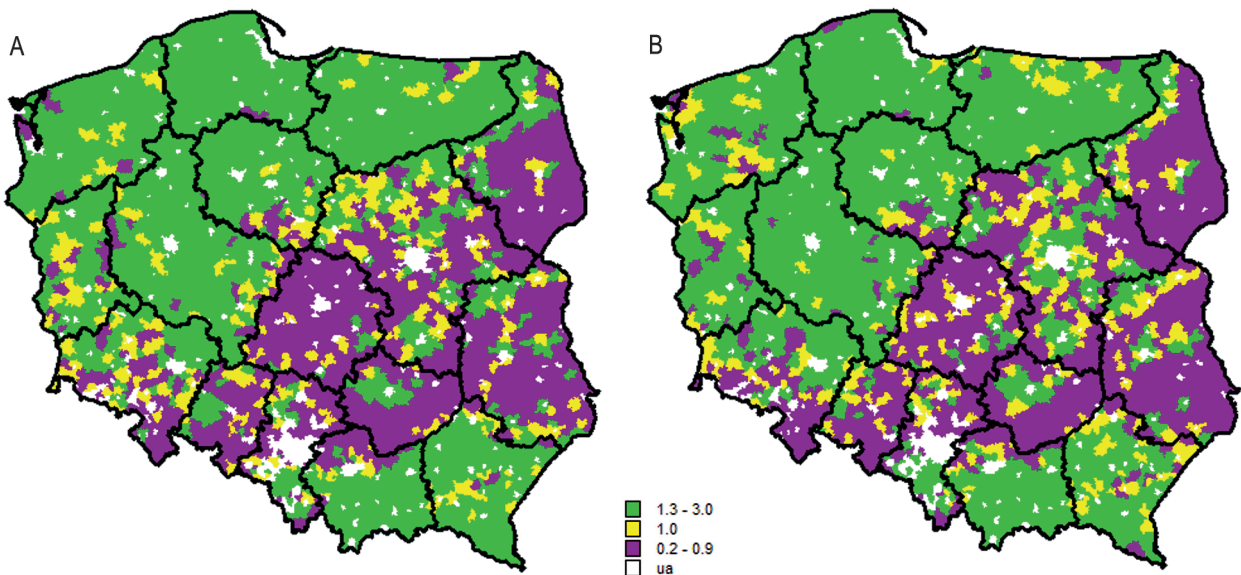

Fig. 14. Demographic dynamics rate in rural areas in Poland

Explanation: A – 1999–2004; B – 2005–2011

Source: Own compilation on the basis of data derived from Local Data Bank, Central Statistical Office

6. Migrations of population

The next demographic characteristic that serves the identification of changes in rural population is migrations. The migration of population is described with indicators such as a rate of migration inflow, a total migration rate and the index of migration effectiveness. The rate of migration outflow has been omitted from the analysis, because its variations in the period in question were insignificant.

According to the first indicator, the dynamics of migration to rural areas was very high in the period in question (see Fig. 15), the highest in those areas that occurred in close and more distant peri-urban areas of particularly large cities. Many studies show (Szymańska, Biegańska, 2011b) that population started flowing to rural areas already in the early 1990s. The range of factors determining in-migration, particularly to peri-urban areas, consists of social factors (less populous areas are chosen), economic factors (lower cost of living) and environmental factors (living closer to the nature). Regardless of what motivates migrants, their choices confirm that the suburbanisation processes in Polish rural areas, particularly counter-urbanisation and urban sprawl, are advancing (Szymańska, Biegańska, 2011a, 2011b). The processes are reflected in the amount of population flowing to rural areas that rose from 12.7‰ in the years 1999–2004 to as much as 14.1‰ in 2005–2011 (12.0‰ in 1990).

In this analysis, migration in rural areas is also assessed with a total migration rate and the index of migration effectiveness. Fig. 16 shows that the mobility of population living in rural areas was increasing. An average rate of total migration was 24‰ between 1999 and 2004, but in the years 2005–2011 it reached almost 26‰. The index of migration effectiveness pointing to growing interest in rural areas as a migration destination confirms this trend. Compared with the years 1999–2004 when its rural value was 4 people per 100 migrants, in the period 2005–2011 it was almost 10 people (Table 1) (it was minus 2 per 100 migrants in 1991). A high rate of total migration and a high index of migration effectiveness (Fig. 16, 17) were found in the peri-urban areas of large cities. It is noteworthy that their values are determined not only by demographic factors (a favourable age structure, positive natural increase, high dynamics of the number of population), but also by social factors (a considerable share of people with secondary and tertiary education, a high percentage of people with jobs outside agriculture), economic factors (a large number of firms), and infrastructure factors (Szymańska, Biegańska, 2011b). All the factors make rural gminas adjacent to large cities more competitive than those occurring in so-called peripheral rural gminas.
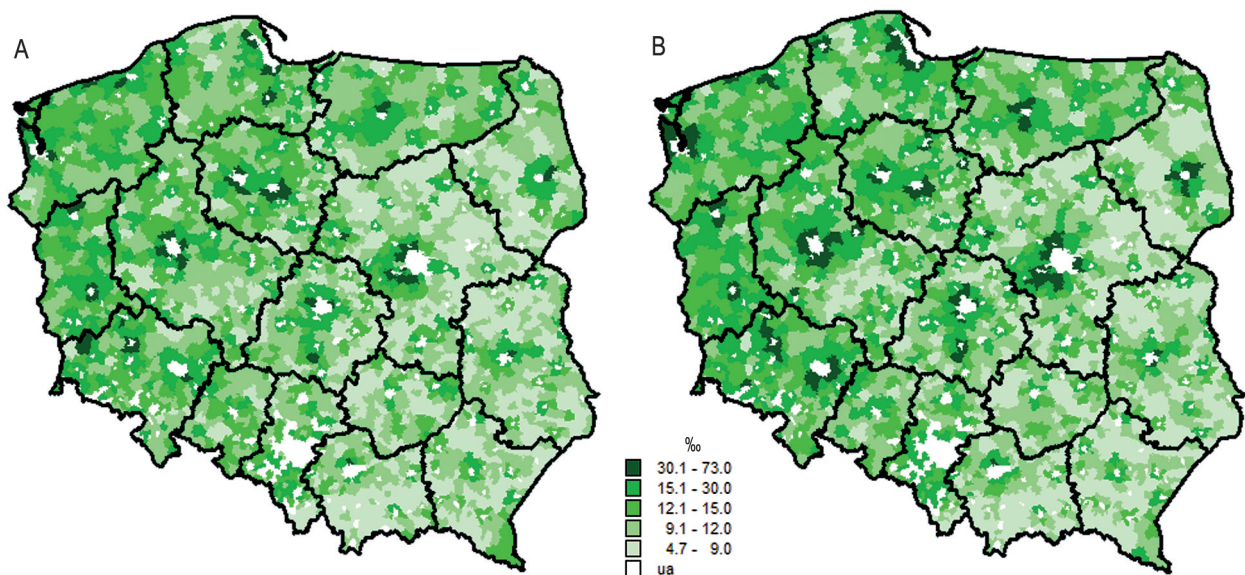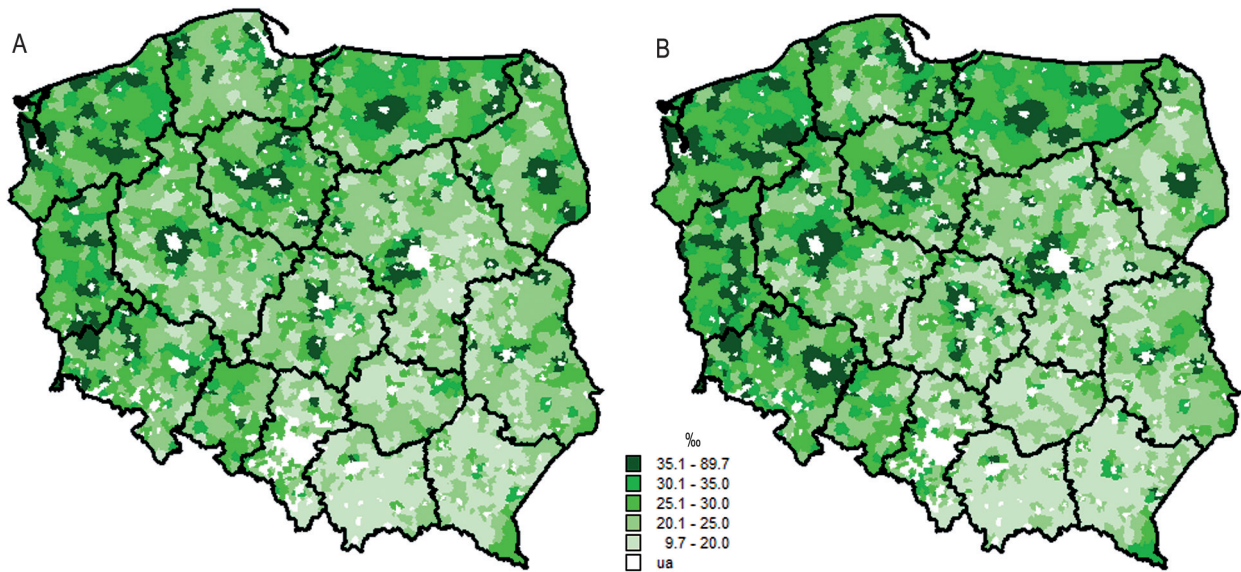

Fig. 15. Total inflow per 1,000 population in rural areas in Poland

Explanation: A – 1999–2004; B – 2005–2011

Source: Own compilation on the basis of data derived from Local Data Bank, Central Statistical Office
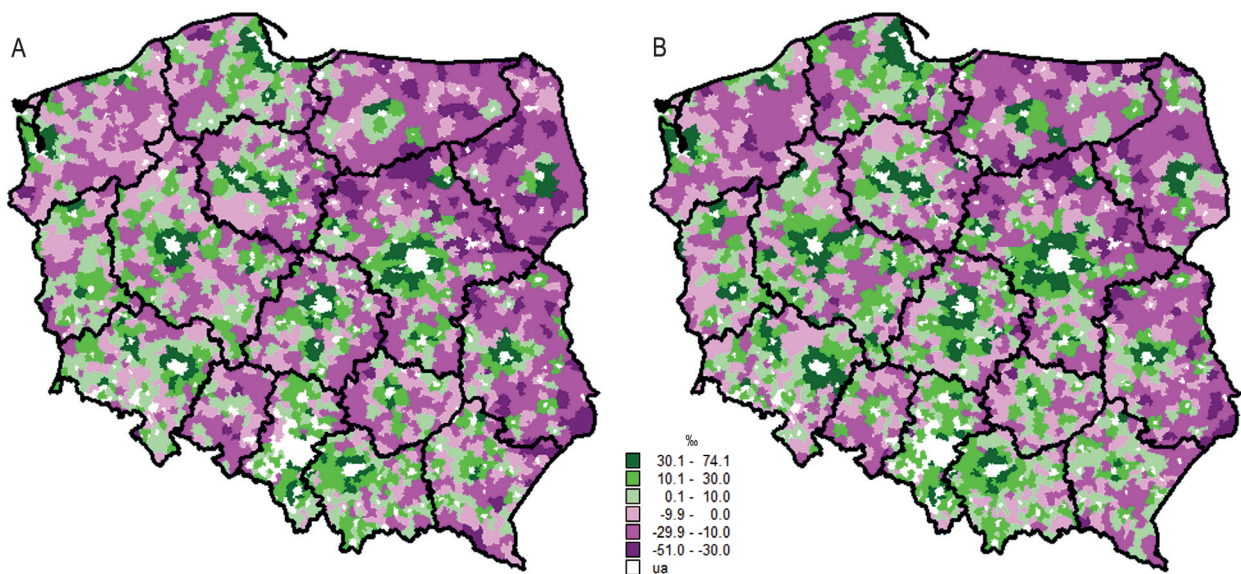
Fig. 16. Rate of total migration per 1,000 population in rural areas in Poland

Explanation: A – 1999–2004; B – 2005–2011

Source: Own compilation on the basis of data derived from Local Data Bank, Central Statistical Office

Fig. 17. Index of migration effectiveness in rural areas in Poland

Explanation: A – 1999–2004; B – 2005–2011

Source: Own compilation on the basis of data derived from Local Data Bank, Central Statistical Office

7. Classification of rural areas in Poland with the k-means method

To find out whether the demographic structures and processes in Polish rural areas show regional similarities, the k-means method enabling the aggregation of analysed objects into clusters was applied. The procedure used the means of eighteen variables (see Material and research methods) representing population dynamics and density, gender and age structures, migrations, and vital statistics from the years 2005–2011.

As a result, three clusters of rural areas have been formed. Cluster I with 705 (32.5%) rural gminas shows high dynamics of the number of population, because the areas are very attractive for in-migrants and natural increase is high. Compared with the other groupings, the rates of population inflows and outflows in cluster I are substantial, leading to very high rates of migration inflows and outflows and a significant index of migration effectiveness. As birth rates are high and death rates are low, the cluster I gminas have natural increase that is both positive and high, as well as above-replacement reproduction. High birth rates in cluster 1 are related to high general fertility rates that translate into relatively high shares of the pre-working age population, moderately high shares of the working-age population, and modest shares of the post-working age population. As a result, the values of the indicators showing the level of demographic ageing and the pace of population ageing are low. Cluster I has also been found to have slightly higher aver-

age feminisation rates than the other clusters (in the age group 20–34 years) and moderate population density (Table 2). The demographic structure and processes in rural gminas comprising cluster I show them to have promising conditions of demographic development. Gminas comprising this cluster occur in the vast and contiguous areas in northern Poland, and partly in western and southern regions. In central and eastern Poland, they constitute the peri-urban areas of large cities (Fig. 18). Cluster II is made of 896 rural gminas that account for 41.3% of their total number. These gminas are different from the others in that they have very high density of population (Table 2) and average values of the other variables. The conditions of demographic development are moderately promising. These gminas mainly occur in the southern part of the country (Dolnośląskie, Opolskie, and Śląskie, the northern part of Małopolskie and Podkarpackie) and in the peri-urban areas of large cities lying in central and partly in eastern Poland (Fig. 18).
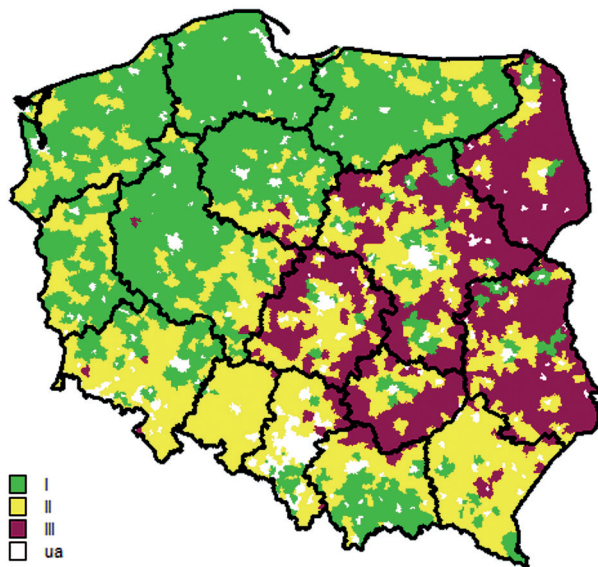

Fig. 18. Classification of rural areas in Poland in the context of demographic structures and processes (by usage of k-means method)

Source: Own compilation on the basis of data derived from Local Data Bank, Central Statistical Office

Cluster III has 570 gminas (26.3%) where the analysed structures and processes are the least promising of demographic development. The dynamics of the number of population is low and some areas are affected by depopulation. The age structure in these gminas (small shares of the pre-working age and working age populations, a considerable share of the post-working age population) and the gender structure (a significant deficit of women at matrimonial age) are unfavourable. Other neg-

ative characteristics are advanced ageing processes, low number of births, a fairly high number of deaths, negative natural increase and reproduction below the replacement level. The mobility of their residents is also relatively low and more people leave the gminas than arrive (so the index of migration effectiveness is low). Among all analysed gminas, those in cluster III have the lowest population density. Most of them occur in eastern Poland (Fig. 18).

Table 2. Values of k-means in clusters

A	I	II	III
1	0.00	0.25	-0.39
2	0.62	-0.05	-0.69
3	0.25	0.25	-0.71
4	0.85	-0.29	-0.59
5	0.58	0.27	-1.14
6	-0.92	-0.04	1.21
7	-0.83	0.02	1.00
8	-0.78	-0.17	1.23
9	-0.68	-0.11	1.02
10	0.91	-0.37	-0.54
11	0.63	-0.49	-0.01
12	-0.82	-0.14	1.24
13	1.00	-0.07	-1.12
14	1.06	-0.22	-0.96
15	0.50	-0.07	-0.51
16	0.38	-0.23	-0.11
17	0.57	-0.15	-0.47
18	0.28	0.16	-0.59

Explanation: I – cluster I; II – cluster II; III – cluster III; A – variables; 1 – population density (persons per sq. km); 2 – dynamics of population number (%); 3 – feminisation rate at age 20–34 years; 4 – share of pre-working age population (%); 5 – share of working age population (%); 6 – share of post-working age population (%); 7 – ageing index; 8 – parent support ratio; 9 – intensity of ageing; 10 – birth rate (‰); 11 – general fertility rate; 12 – death rate (‰); 13 – natural increase (‰); 14 – demographic dynamics rate; 15 – total inflow (‰); 16 – total outflow (‰); 17 – rate of total migration (w ‰); 18 – index of migration effectiveness

Source: Own compilation on the basis of data derived from Local Data Bank, Central Statistical Office

8.   Conclusions

The main finding that the research on Polish rural areas has provided is that their demographic structures and processes show inter-regional differences. According to the outcomes of the k-means method, rural areas with promising demographic conditions that prevail in northern and western Poland and in the immediate per-urban areas of cities in central and eastern Poland coexist with rural areas where the conditions are moderately promising (southern, central Poland and some patches in eastern Poland) and the least promising (mainly eastern Poland).

As shown, the balance of migration and natural increase are currently positive in rural areas, so the number of rural population is growing. This implies that its share in the total country's population will also be increasing in the long term. These demographic trends confirm migrants' rising interest in rural areas and provide grounds for believing that their demographic development will continue.

Polish rural areas follow the same path of demographic development as most rural areas in Western Europe. Areas adjacent to towns and large cities, but also the more distant ones, still receive increased inflows of urban population and have positive migration balances, as a result of which the peri-urban areas keep expanding. Most people migrating to the rural parts of peri-urban areas are young. Their inflows and the procreative decisions they make rejuvenate the areas, leading to the development of demographically young circles around cities on the map of Polish rural areas.

As found, the gender structure and the age structure of some rural areas still show negative trends, with a rising level of demographic ageing and an increasing pace of population ageing.

The rural birth-to-death ratio in rural areas is deteriorating. Although the demographic dynamics rate is still positive and ensures a surplus of births over deaths, the unchanging level of reproduction in rural areas prevent population replacement. Because rural areas, like all other areas in the country, need sustainable development, an appropriate pro-natalist policy is necessary to increase the number of births per woman at childbearing age, or at least to maintain its present level.

The changes in the demographic structure and processes in Polish rural areas that the research has identified are not considerably different from their general pattern observed in highly developed countries. In both cases, ageing processes and changes in reproduction patterns, nuptiality, and migrations are noticeable, which are less intense compared with those occurring in urban areas.

Note

(1) In 2011, Poland had 2,173 gminas that either met the formal and legal criteria for being classified as rural or had a rural part. The gmina of Szczawnica and the gmina of Jaśliska have been omitted from the analysis. The status of Szczawnica changed from urban to urban-rural in 2008 and Jaśliska became a rural gmina in 2010 (before that it was part of the gmina of Dukla).

Acknowledgements

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