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## **STRUCTURE OF DEMOGRAPHIC TYPES OF SMALL TOWNS IN POLAND SPATIAL AND TEMPORAL APPROACH**

**Abstract.** The aim of this paper is to determine changes in the structure of demographic types of small towns in Poland between 2004 and 2013. It is assumed in the paper, following the Central Statistical Office of Poland, that small towns are urban settlements having less than 20,000 inhabitants. The time period covered in this study is the time of Poland's accession to the EU, which brought reduction of many barriers on the labour market and in migration movement. Demographic types of small towns were determined using Webb's typology. Natural increase and migration indicators constitute its base. It was found that the share of towns of progressive character decreased and the share of those of regressive character increased in the analyzed period. A negative migration balance had the greatest effect on the number of inhabitants of the analyzed settlement units. The described demographic changes in small towns in Poland were connected with the second stage of demographic transition.

**Keywords:** small towns in Poland, demographic types.

### **1. INTRODUCTION**

The economic crisis of the 1970s in developed countries forced quantitative and qualitative changes in their economies. Reorganization of production and labour as well as spatial transformations were indicators of these changes. There was a slow transition from exogenous type of development, which is based on external factors, to endogenous development, in which local resources – social, economic and environmental – played the main role. Each particular spatial unit started to create its economic success using local labour force, knowledge and experience.

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In the majority of these countries labour force was sufficient as numerous groups of people born after the Second World War reached productive age (Lindh and Malmberg, 1999). Even though the birth rate and natural increase decreased (Carpow *et al.*, 2001), the birth rate was still higher than the death rate. As a consequence, the number of people increased (see: Bloom *et al.*, 2001). Nevertheless, during the development process, natural increase reached a level which did not ensure a simple replacement rate (see: stage one of demographic transition theory, Notestein *et al.*, 1944; Handwerk, 1983). Since the 1960s demographers have been observing a range of new phenomena, completely different from the earlier patterns. Among them, Lesthaeghe (1991) mentions a growing number of divorces, fertility decrease in all age groups, end of the baby boom period and end of the process of lowering the age of getting married. There also was, as the cited author claims, an increase in so called forced (or rushed by pregnancy) marriages and in the percentage of pregnant teenagers. Moreover, in the 1970s and 1980s the number of informal relationships grew. Consequently, an increase in the number of extramarital children was observed, yet fertility ratios among women below 25 years old did not improve (Lesthaeghe, 1991). Migration moves intensified as well (see stage two of demographic transition theory, Van de Kaa, 1987, 2003; Lesthaeghe, 2010).

These negative demographic processes reached Central and Eastern Europe, including Poland, at the beginning of the 1990s (Sánchez-Barricarte and Fernández-Carro, 2007). The drop in the birth rate and a stable death rate caused a very low natural increase. It was strongly diversified in particular spatial units. Natural decrease was mainly observed in large cities, yet it was compensated by a positive migration rate. In smaller city centers and on peripheral rural areas, on the other hand, a positive natural increase was not compensated by migration inflow. This caused depopulation processes (Kamińska and Mularczyk, 2014). The worst situation was observed in the areas which experienced both natural decrease and migration outflow as demographic potential reduction is strictly connected to shrinkage of labour force, the basic economic growth factor.

A question arises how the above mentioned demographic processes were evolving in small towns in Poland. It is an important research issue as centers of this size constitute an important element of the country's settlement network and perform functions important for the surrounding rural areas development (Heffner, 2008). Demographic shortage may cause infrastructural limitations, a decrease in location attractiveness and, consequently, disappearance of relevant functions (Hoekveld, 2012; Haase *et al.*, 2013).

In Poland in 2013 there were 686 small towns, which accounted for around 75% of all urban settlements in the country. More than 20% (5 million) of city dwellers lived there.

Small urban centers were strongly diversified considering both the number of inhabitants and the functions performed by them. The smallest town had 906 inhab-

itants. Agriculture (Bagiński, 1998; Kozłowski, 2007), services – including administrative, retail, tourist and sanatorium activities (Heffner 2008) – and, more rarely, industrial activities (Kachniarz *et al.*, 1996) were the base for their functioning.

In the light of the above remarks, the aim of this paper is to determine the changes in the structure of demographic types of small towns in Poland between 2004 and 2013. The following questions need to be answered:

– How did the demographic potential of small towns in Poland change between 2004 and 2013?

– How did the proportion between progressive (where number of inhabitants is growing) and regressive (where number of inhabitants is decreasing) types of small towns in Poland shape between 2004 and 2013 and what was their regional diversification in this respect?

– What changes did progressive demographic types of small towns in Poland experience between 2004 and 2013?

– What changes did regressive demographic types of small towns in Poland experience between 2004 and 2013?

– Which components of the total population growth had the biggest influence on shaping the inhabitants number of small towns in Poland between 2004 and 2013?

It was assumed in the paper that, as Central Statistical Office defines, small towns are the centers with administrative civic rights and with less than 20 000 inhabitants. Similar assumptions were made in Polish Geography research by, among others, Dziewoński (1983); Heffner and Czarnecki (2004).

The time period covered in the paper is 2004–2013, the time of Poland's accession to the European Union, which led to limitation of many barriers on the labour market and in migration movements.

Demographic types of small towns were determined using Webb's typology (1964). Natural increase and net migration indices constitute its basis. This typology enables determining the dominant cause of changes in the population of the analyzed cities.

Eight demographic types were distinguished and named with letters from A to H. The first four (A, B, C, D) are developing, in which an increase in population occurs, the following four (E, F, G, H) are regressive, in which a decrease in population is observed. Particular types are characterized by different relations between natural increase and net migration:

A – positive natural increase is higher than negative net migration;

B – positive natural increase is higher than positive net migration;

C – positive natural increase is lower than positive net migration;

D – positive net migration is higher than negative natural increase;

E – negative natural increase is not compensated by positive net migration;

F – negative natural increase is higher than negative net migration;

G – negative natural increase is not higher than negative net migration;

H – negative net migration is not compensated by positive natural increase.

## 2. POPULATION ISSUES IN SMALL TOWNS – STATE OF RESEARCH

Since the end of the 20th century, a growing interest in issues related to changes in the demographic potential of different spatial units is observed in the European literature of the subject. Elaborations concern both entire countries and various elements of the settlement network. Research results show that demographic trends are widely diverse in different regions of the world (Veneri and Ruiz, 2013). Dichotomous approach dominates, which can be analysed in the light of the theory core-periphery (Parr, 1973; Partridge *et al.*, 2007). Cores (urban regions) are characterized by growing population, while peripheries (small towns and rural areas) experience population decrease. However, demographic trends vary even within the group of small towns. Conditions such as location in metropolitan areas (Čermák *et al.*, 2009) and along main routes (*The Future of Shrinking Cities...*, 2009) or exceptional tourist attractiveness (Cheshire and Magrini, 2004; Domhardt and Troeger-Weiß, 2009) are, among others, favorable to population growth. Low level of economic development, which leads to emigration of the young members of society, is among major factors causing population decrease (Daniels and Lapping, 1987; Fuguitt *et al.*, 1989; Fuguitt and Heaton, 1995; Johnson 2006; Kantor-Pietraga *et al.*, 2012).

In developing countries, a dynamic growth of the biggest cities resulted in influx of population from peripheral rural areas and small towns with dominating agricultural function. Authors of publications dealing with this subject analyse causes and consequences of the shrinking demographic potential of small settlement units and propose solutions to restrain negative development tendencies (e.g.: Rondinelli, 1984; Hardoy and Satterthwaite, 1986; Baker, 1988; Choguill, 1989; Titus, 1998; Titus and Hinderink, 2002; Tacoli, 2004). In turn, in highly developed countries the demographic processes in small towns were often analysed in relation to the growth of labour efficiency in agriculture, which leads to emigration of labour force from the smallest urban centres and rural areas. Such tendencies were identified for example in the central territories of Australia (Tonts, 1996; Gabriel, 2002; Alston, 2004).

In the literature concerning small towns in Western Europe the focus is increasingly on issues related to depopulation of small postindustrial towns and to the growth of the smallest urban centers as a result of immigrations of foreigners. It has been observed that in some regions, especially in southern Europe, the influx of people from developing countries and countries newly admitted to the EU had become an important element influencing the demographic structures of small towns. These issues were addressed, among others, by: Fonseca (2008); Graeme and Morén-Alegret (2008); Morén-Alegret (2008).

Glock (2006), Mykhnenko and Turok (2008), Kamarai (2011), Kantor-Pietraga (2014), and Kantor-Pietraga *et al.* (2012) pointed to depopulation of small

towns in Western and Central Europe in the period of system transformation. The authors indicated that negative demographic processes touched mostly the smallest urban centers with industrial functions. Restructuring processes resulting in the collapse of many work establishments constituted a condition favouring emigration.

Small towns in Poland after the Second World War experienced economic regress or stagnation as a result of social and economic transformation. Only few developed as a consequence of political decisions regarding their industrialization (Szymańska and Grzelak-Kostulska, 2005). Thus, geographic literature was dominated by papers concerning the possibilities and necessary conditions for their development (Fiejka, 1954; Kostrowicki, 1953, 1957; Kielczewska-Zaleska, 1957; Dziewoński, 1957; Liszewski, 1975; Wysocki, 1975). Issues related to demographic changes in small towns were less often brought up at that time.

In the period of systemic transformation, initiated in 1989, local governments were trying to redefine the role of small towns in the spatial structures of regions, searching for new development impulses and chances for improvement in living conditions of local communities (Heffner, 2008). The effects of these actions varied spatially. Some of the small centers succeeded economically, some fell into recession. Different demographic tendencies were the consequences of development pace diversity. Population growth was observed in some centers, while in others decrease or stagnation was noted.

Heffner (2008), Szymańska (2002), Szymańska and Grzelak-Kostulska (2005), Konecka-Szydłowska and Weltrowska (2006), Konecka-Szydłowska and Matykowski (2007), Jażewicz (2005, 2009), Sobala-Gwosdz (2010), among others, paid attention to the demographic situation as one of the most important development factors of the smallest urban settlements in Poland. Kantor-Pietraga (2014), Kantor-Pietraga *et al.* (2012), among others, wrote about cities with shrinking numbers of inhabitants. The authors indicated factors that caused depopulation of small towns in the analysed areas. They included legal and administrative, geographic and historic, demographic and social, location, physiographic and economic factors. Kwiatek-Sołtys (2004) pointed to the growing significance of negative migration balance in changes in the size of small town populations.

### **3. CHANGES IN THE POPULATION POTENTIAL OF SMALL TOWNS BETWEEN 2004 AND 2013**

Between 2004 and 2013, the number of cities in Poland increased from 886 to 908, that is 2.5% (table 1). It mostly resulted from granting town status to some of the rural settlements. In the group of small towns an increase in number from

665 to 686, that is over 3%, was noted. The number of the rest of urban settlement units rose from 221 to 322 (45%). Demographic processes in the analyzed period were different in particular size groups. In small settlement units an increase in population was observed (by 1.4%). Other towns experienced a decrease in population (by 1.5%). As a result of these demographic trends, small towns increased their significance in the population structure of the urban settlement network from 20.9% to 21.4%.

Changes both in the number and demographic potential of small towns had several reasons. Firstly, five cities were excluded from the studied set of cities because their populations increased in the researched period to reach more than 20 thousand. Secondly, four settlement units of medium size were included in this group as a result of decrease in population below 20 thousand. Thirdly, 22 settlement units between 2004 and 2013 obtained town status.

Table 1. Changes in the number of small towns and their populations between 2004 and 2013

Number of cities	Number of cities		Rate of change 2004 = 100%	Percentage share of cities		Number of inhabitants (million)		Rate of change 2004 = 100%	Percentage share of urban population	
	2004	2013		2004	2013	2004	2013		2004	2013
Cities in total	886	908	102.5	100.0	100.0	23.5	23.3	99.1	100.0	100.0
Small towns	665	686	103.2	75.1	75.6	4.9	5.0	101.4	20.9	21.4
Other cities	221	222	100.5	24.9	24.4	18.6	18.3	98.5	79.1	78.6

Source: own calculations based on Baza Danych Lokalnych (Local Data Base, BDL) of the Central Statistical Office.

Should the analysis be limited only to those cities that may be included in the set of small centers both in 2004 and 2013, it occurs that the number of their inhabitants was at a similar level in both time sections (increase by 0.4%). In 264 cities (that is 33.9%) a decrease in population was noted, and the dynamic index between 2004 and 2013 varied between 72.1% and 99.0%. In exactly the same number of cities an increase in the demographic potential was noticed (dynamic index 101–156%). In 132 units (that is 20.2%) the population remained at almost the same level (dynamics 99.1–100.9%). No correlation between the size of the small towns and the dynamics of their population was stated. The correlation index was -0.133.

#### **4. CHANGES IN DEMOGRAPHIC TYPES OF SMALL TOWNS BETWEEN 2004 AND 2013**

The above presented demographic trends were the resultant of natural increase and migration balance. Particular relations between the mentioned characteristics determined the classification of a town into a proper type according to Web's classification.

In 2004 the vast majority of small towns represented the regressive types. There were 441 such centers, which accounted for 66.8% of the total number. In the course of time the population crisis understood as a decrease in demographic potential spread to other units. In 2013, the number of cities representing regressive demographic types increased by 19% (table 2). The process was strongly diversified regionally. The number of urban centers characterized by a decrease in population was highest in Mazowieckie voivodeship (increase by 52%), Śląskie (50%) and Lubuskie (42.9%). As a consequence, regressive cities in Mazowieckie accounted for more than half of the researched set (64%, and 41% in 2004), in Śląskie 79.4% (53% in 2004), and in Lubuskie 83% (58% in 2004).

The spatial arrangement allowed an observation that in many towns of the progressive character in 2004, processes occurred changing their demographic types to regressive. It concerned not only the centers located peripherally in relation to urban agglomerations and main transport routes, but also those lying close to them (figure 1).

In other regions of the country, the number of cities with population decrease rose by 20–35%. They were: Lubelskie, Świętokrzyskie, Wielkopolskie, Kujawsko-Pomorskie and Pomorskie voivodeships. A particularly unfavorable situation was visible in Świętokrzyskie and Lubelskie, as small towns of regressive demographic types constituted almost all the centers of this size group (in Świętokrzyskie it was 100%, in Lubelskie 93%). Agricultural character of those regions and the lack of demand – supply adjustment on the labour market caused on the one hand migration outflow of the young, and on the other – changes in family size. It should also be added that the population decrease in those regions did not concern only small, but also big and medium cities and even voivodeships.

In Wielkopolskie, Kujawsko-Pomorskie and Pomorskie voivodeships the proportions between small towns of progressive and regressive types were also changed. The latter increased their share in the structure of the smallest urban settlements: in Wielkopolskie from 50.6 to 62%, in Kujawsko-Pomorskie from 68 to 90% and in Pomorskie from 66.6 to 85.2%. Regressive centers created almost concentric circles around regional capitals.

In the remaining voivodeships of the country the number of regressive towns increased by 2–19%, and only in Podlaskie voivodeship it remained at an unchanged level.

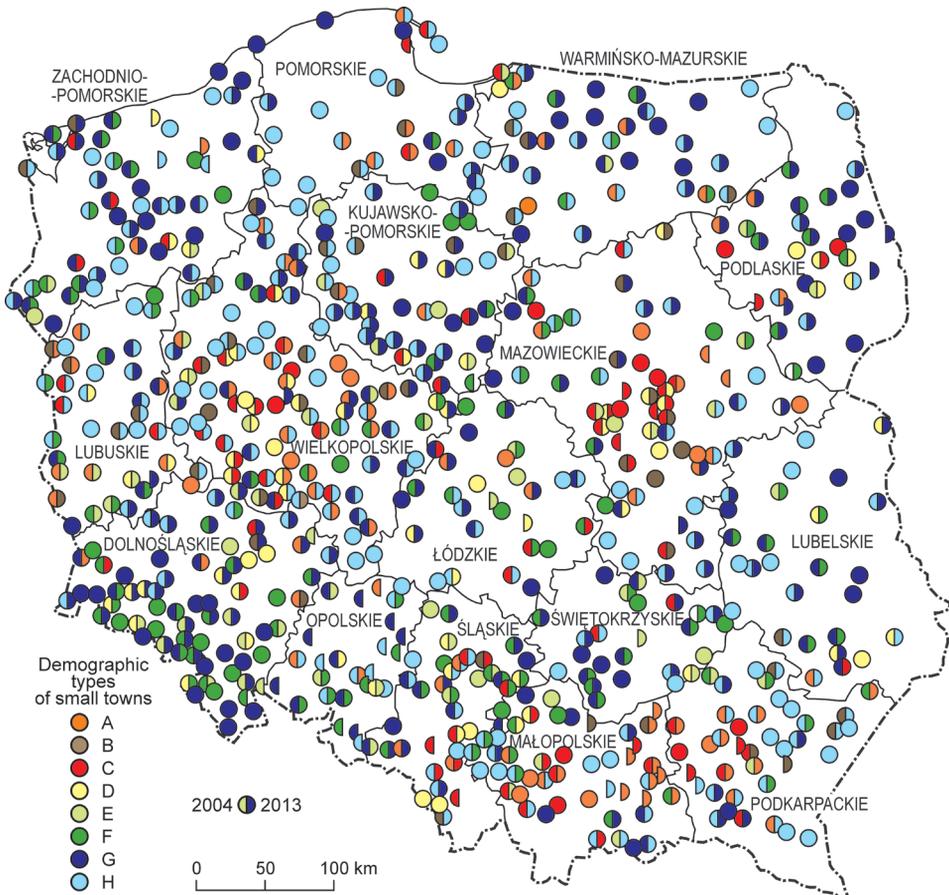


Fig. 1. Changes in demographic types of small cities in Poland between 2004 and 2013

Source: own elaboration

In the progressive group of cities a significant decrease in their number was noted – from 219 in 2004 to 135 in 2013, that is by almost 40%. Only in Podlaskie voivodeship their number did not change, and in other regions the decrease was between 14 and 100%. The highest decrease in the number of cities of the progressive type occurred in Świętokrzyskie voivodeship, in which in 2013 there was not a single small town with an increase of population, and in Lubelskie and Kujawsko-Pomorskie voivodeships, in which their number decreased by almost 70%. The number of progressive cities decreased by more than half in Śląskie, Lubuskie, Pomorskie, and Warmińsko-Mazurskie voivodeships. Relatively the least unfavorable demographic processes in small towns were observed in Małopolskie and Zachodniopomorskie voivodeships, in which

the decrease in the number of towns of the progressive types was less than 15%. It should also be underlined that between 2004 and 2013, in all the voivodeships the share of progressive towns in the studied group lowered significantly. At the beginning of the researched period the index varied between 13 and 58%, and in 2013 it ranged from 0 to 38%. The largest (over 20%) decline in the significance of small, progressive cities was noted in Śląskie (by 26.5%), Lubuskie (by 25%), Kujawsko-Pomorskie (by 22.7%) and Mazowieckie (by 21.7%) voivodeships. The smallest decrease was in Zachodniopomorskie (by 2,0%) and Małopolskie (by 4.9%). Only in Podlaskie voivodeship the progressive small towns kept their 25% significance.

Table 2. Changes in demographic types of small towns between 2004 and 2013

Voivodeship	Number of small towns of progressive type		Rate of change 2004 = 100%	Number of towns of regressive type		Rate of change 2004 = 100%
	2004	2013		2004	2013	
Łódzkie	7	5	71.4	19	21	110.5
Mazowieckie	35	22	62.9	25	38	152.0
Małopolskie	14	12	85.7	27	29	107.4
Śląskie	16	7	43.8	18	27	150.0
Lubelskie	7	2	28.6	22	27	122.7
Podkarpackie	13	10	76.9	22	25	113.6
Podlaskie	7	7	100.0	21	21	100.0
Świętokrzyskie	5	0	0.0	19	24	126.3
Lubuskie	15	6	40.0	21	30	142.9
Wielkopolskie	44	34	77.3	45	55	122.2
Zachodniopomorskie	7	6	85.7	44	45	102.3
Dolnośląskie	13	10	76.9	57	60	105.3
Opolskie	4	2	50.0	24	26	108.3
Kujawsko-Pomorskie	14	4	28.6	30	40	133.3
Pomorskie	9	4	44.4	18	23	127.8
Warmińsko-Mazurskie	9	4	44.4	29	34	117.2
Total	219	135	61.6	441	525	119.0

Source: own calculations on the basis of BDL of the Central Statistical Office.

The question arises which of the population growth components had the greatest impact on the development of demographic types of small towns in Poland.

## **5. DEMOGRAPHIC PROCESSES IN SMALL TOWNS OF THE PROGRESSIVE TYPE BETWEEN 2004 AND 2013**

Among the small towns in Poland the share of progressive type settlement units decreased in the researched period. In 2004 it amounted to 33.2% and in 2013 to 20.5% (table 3).

At the beginning of the analyzed period there were 60 small towns of type A, in which a positive natural increase was higher than the negative net migration. 20% of them had not changed their character by 2013. Around 8% remained in the progressive group and changed the type to B, C or D. The rest could be found in 2013 in the regressive set of cities. The majority, almost 37% of the researched settlement units were included in type H in 2013, in which the net migration was not compensated by positive natural increase. A significant group of around 28% consisted of small towns which changed their type to G, in which the negative natural increase was not higher than the negative net migration (table 3).

Among the analyzed centers in 2004 there were 38 type B cities, in which a positive natural increase was higher than the positive net migration. Around 8% of them did not change their demographic type in the analyzed period. 21% remained in the progressive group changing the type to A (16%) and C (5%). The remaining 71% were included in the regressive set of cities in 2013. The majority of type B small towns (2004) at the end of the analyzed period moved to H (47%) and G (21%) groups (table 3).

The least changes in demographic types in the analyzed period occurred among 62 small towns included in group C, in which a positive natural increase was lower than a positive net migration. 19% of them did not change their demographic character and 34% remained in the set of centers of regressive character. The remaining (47%) were included in 2013 in the set of regressive cities, with prevalence of types H (23%) and G (13%) (table 3).

Out of 59 type D cities in 2004, at the end of the researched period 22% kept their demographic type characterized by a positive net migration higher than the negative natural increase. Other 22% changed their type while remaining in the progressive set of cities. 56% of the centers qualified as type B in 2004, at the end of the researched period could be found in the group of regressive centers. Type G (20%) prevailed among them, and the other types (E, F, H) accounted for around 10% each.

It may be stated that the biggest group of small towns of progressive character in 2004 had moved by 2013 to regressive types G and H. The negative net migration rate became the most important factor shaping demographic changes between 2004 and 2013. It was the result of intensification of the phenomena connected with the second stage of the demographic transition in small towns of our country.

Table 3. Changes in demographic types of towns of progressive character between 2004 and 2013

Demographic types of towns in 2004	Number of towns	Demographic types of towns in 2013 (%)								Total (%)
		A	B	C	D	E	F	G	H	
A	60	20.0	1.7	3.3	3.3	3.3	3.3	28.3	36.7	100
B	38	15.8	7.9	5.3	0.0	2.6	0.0	21.1	47.4	100
C	62	17.7	8.1	19.4	8.1	6.5	4.8	12.9	22.6	100
D	59	3.4	3.4	15.3	22.0	13.6	10.2	20.3	11.9	100

Source: own calculations based on BDL of the Central Statistical Office.

As a result of the described processes a change in the structure of demographic types of small towns of progressive character occurred in the analyzed period in Poland.

In 2004, among the analyzed settlement units of progressive character, C type small towns, in which a positive natural increase was lower than a positive net migration, had the highest share in the whole set of settlement units. This demographic type was the most numerous in Mazowieckie (21.7%) and Podkarpackie (20%) voivodeships. Small towns of type C did not exist in Warmińsko-Mazurskie, Opolskie and Lubelskie regions. types A and D were characterized by a slightly lower share of around 10% of the analyzed settlement units in the researched period. Small towns of Type A were the most numerous in Mazowieckie and Lubuskie voivodeships (almost 17% of all the towns) in 2004. The least numerous representation of centers of this type was in Zachodniopomorskie (2%), Kujawsko-Pomorskie (2.3%) and Dolnośląskie (around 3%) regions. Small towns of type A, in which a positive natural increase was higher than a negative net migration in 2004, did not exist in Świętokrzyskie voivodeship. Type B settlement units, in which a positive natural increase was higher than a positive net migration rate, had the lowest share in the whole analyzed set (5.8%). Their proportion was the highest in Lubuskie (14%) and Kujawsko-Pomorskie (11%) regions. Small towns of this demographic type were not present in Podlaskie, Łódzkie, Opolskie and Świętokrzyskie voivodeships (table 4).

In 2013 a decrease in the number of small towns of progressive character occurred in comparison to 2004. As a consequence, a decrease in their percentage share in the whole researched set of settlement units could be observed. At the end of the researched period in Poland, among small towns in which an increase of population was noted, type A characterized by a positive natural increase higher than a negative net migration dominated (7.3%), mainly: Podkarpackie (20%), Wielkopolskie (16.9%) and Małopolskie (14.6%) voivodeships. Small towns of

this type were not present in Zachodniopomorskie, Lubelskie and Świętokrzyskie voivodeships. Small towns of type C and D were of less significance in the structure of progressive demographic types compared to 2004 (respectively: 5.8 and 4.7% of all the towns). The highest share of type C centers, in which a positive natural increase was lower than a positive net migration was noted in Mazowieckie (13%) and Podlaskie (around 11%) voivodeships. Centers of this type were not present in Lubuskie, Pomorskie, Kujawsko-Pomorskie, Opolskie and Świętokrzyskie voivodeships. Type B centers were the least significant in the structure of small towns of progressive character in Poland, both in 2013 and in 2004. Their share in the whole researched set decreased from around 6 to almost 3%. In eight voivodeships (Małopolskie, Podlaskie, Śląskie, Łódzkie, Zachodniopomorskie, Opolskie, Lubelskie and Świętokrzyskie) this demographic type was not noted in 2013 (table 4).

Table 4. Changes in the share of small towns of the progressive type by voivodeship between 2004 and 2013

Voivodeship	Percentage share									
	2004					2013				
	A	B	C	D	total	A	B	C	D	total
Wielkopolskie	12.4	7.9	13.5	15.7	49.4	16.9	6.7	7.9	6.7	38.2
Mazowieckie	16.7	8.3	21.7	11.7	58.3	8.3	8.3	13.3	6.7	36.7
Małopolskie	12.2	4.9	14.6	2.4	34.1	14.6	0.0	9.8	4.9	29.3
Podkarpackie	8.6	8.6	20.0	0.0	37.1	20.0	2.9	5.7	0.0	28.6
Podlaskie	7.1	0.0	7.1	10.7	25.0	3.6	0.0	10.7	10.7	25.0
Śląskie	11.8	5.9	11.8	17.6	47.1	5.9	0.0	8.8	5.9	20.6
Łódzkie	11.5	0.0	7.7	7.7	26.9	3.8	0.0	7.7	7.7	19.2
Lubuskie	16.7	13.9	8.3	2.8	41.7	8.3	2.8	0.0	5.6	16.7
Pomorskie	11.1	7.4	14.8	0.0	33.3	11.1	3.7	0.0	0.0	14.8
Dolnośląskie	2.9	1.4	1.4	12.9	18.6	1.4	2.9	5.7	4.3	14.3
Zachodniopomorskie	2.0	3.9	3.9	3.9	13.7	0.0	0.0	5.9	5.9	11.8
Warmińsko-Mazurskie	13.2	7.9	0.0	2.6	23.7	2.6	2.6	2.6	2.6	10.5
Kujawsko-Pomorskie	2.3	11.4	9.1	9.1	31.8	4.5	2.3	0.0	2.3	9.1
Opolskie	10.7	0.0	0.0	3.6	14.3	3.6	0.0	0.0	3.6	7.1
Lubelskie	3.4	3.4	0.0	17.2	24.1	0.0	0.0	3.4	3.4	6.9
Świętokrzyskie	0.0	0.0	8.3	12.5	20.8	0.0	0.0	0.0	0.0	0.0
Total	9.1	5.8	9.4	8.9	33.2	7.3	2.7	5.8	4.7	20.5

Source: own calculations based on BDL data of the Central Statistical Office.

The decrease in the share of small towns of progressive character as well as an increase among them in type A centers, in which a negative net migration rate is a major factor affecting the number of inhabitants, confirm the presence of negative demographic trends in the researched set of settlement units. They are visible in Kujawsko-Pomorskie, Opolskie and Lubelskie voivodeships, and most of all, in Świętokrzyskie voivodeship, where in 2013 small towns with any of the progressive types were not noted.

## **6. DEMOGRAPHIC PROCESSES IN SMALL TOWNS OF REGRESSIVE TYPES BETWEEN 2004 AND 2013**

The percentage of regressive settlement units in the small towns in Poland increased in the analyzed period. In 2004 they constituted 66.8% and in 2013 – 79.5% (table 5).

In 2004, the towns of type E, in which a negative natural increase was not compensated by a positive net migration, were the least numerous group of the regressive type (41 towns). By 2013, 22% of these settlements had not changed their demographic type, 17% could be found in the progressive group, and the majority was included in type D (around 7%). More than 60% of the analyzed cities remained in 2013 in the set of regressive cities, changing the type they belonged to. More than 24%, which is the majority, could be found in the set of settlement units of type F, in which a negative natural increase was higher than a negative net migration rate, and of type G, in which a negative natural increase was not higher than negative net migration (table 5).

In 2004 there were 78 cities of type F, in which a negative natural increase was higher than negative net migration. Almost 31% of them did not change the demographic type in the analyzed period. 15% were included in the group of the progressive type, with the majority (around 6%) in type A. The remaining 54% of the small towns covered by this study remained in the regressive group in 2013, changing only the type. Most of the small towns of type E in 2004 could be found at the end of the analyzed period in type G group (almost 40%), in which a negative net migration rate was the dominant factor causing the decrease in population (table 5).

The smallest changes in demographic types in the analyzed period occurred among 139 small towns included in type G group. As much as 54% of them did not change their demographic type. Almost 9% of the towns could be found in 2013 in the set of progressive settlements. The remaining towns (around 37%), changing their type to a different one (E, F, H) in 2013, were still included in the set of regressive types, with prevalence of type F (around 19%) (table 5).

The most numerous group of cities – 182 in 2004 – were those of type H, in which negative net migration was not compensated by a positive natural increase. Around 45% of them had retained their demographic character by 2013. About 9% found themselves in 2013 in the group of progressive types. The remaining towns (over 45%) changed their demographic type for a different, regressive one. Most of them (around 36%) were in type G in 2013.

Table 5. Changes in demographic types of towns of regressive character between 2004 and 2013

Demographic types of towns in 2004	Number of towns	Demographic types of towns in 2013 (%)								Total (%)
		A	B	C	D	E	F	G	H	
E	41	2.4	4.9	2.4	7.3	22.0	24.4	24.4	12.2	100
F	78	6.4	1.3	3.8	3.8	9.0	30.8	39.7	5.1	100
G	139	2.9	0.0	3.6	2.2	4.3	19.4	54.0	13.7	100
H	182	3.8	2.2	2.2	1.1	0.5	9.3	35.7	45.1	100

Source: own calculations based on BDL data of Central Statistical Office.

In 2004, the dominating type among the analyzed settlement units of regressive character was type H, in which a negative net migration rate was not compensated by a positive natural increase (27.6%). Its highest percentage was in Podkarpackie (48.6%) and Pomorskie (48.1%) voivodeships, and the lowest (8.8%) – in Śląskie voivodeship. Type G had a slightly lower share (21.2%). In 2004, small towns of this type were the most numerous in Zachodniopomorskie (39.2%), Świętokrzyskie (37.5%) and Opolskie (32.1%) voivodeships. The least numerous representation of centers of this type was in Podkarpackie region (below 3%). Settlement units of types F (12%) and E (6.2%) were of less significance among the small towns of the regressive type in this period (table 6).

In 2013, compared to 2004, the number of towns of regressive character increased and consequently their share in the number of all the towns rose. Their structure changed as well. In 2004 type H dominated among the small towns of regressive character and at the end of the period under study type G was dominant (34.2%). The highest percentage of centers in which a negative natural increase was not higher than negative net migration was in Podlaskie (57.1%), Kujawsko-Pomorskie (54.4%), Warmińsko-Mazurskie (52.6%), and Dolnośląskie (51.4%) voivodeships. The lowest percentage was found in Lubuskie (16.7%), Wielkopolskie (16.9%) and Podkarpackie (17.1%). A slight decrease in the significance of type H small towns was noted in the structure of regressive units. In 2004 they accounted for almost 28% of all the settlements, while in 2013 – 26%. The highest share, over 40%, could be found in Pomorskie, Podkarpackie and Lubuskie regions. The lowest share was in

Dolnośląskie (5.7%) and Podlaskie (7.1%). In 2013, settlement units of types E (5.9%) and F (13.5%) remained the least significant among the small towns of the regressive type (table 6).

Table 6. Changes in the share of small towns of the regressive type by voivodeship between 2004 and 2013

Voivodeship	Percentage share									
	2004					2013				
	E	F	G	H	total	E	F	G	H	total
Świętokrzyskie	8.3	12.5	37.5	20.8	79.2	12.5	33.3	41.7	12.5	100.0
Lubelskie	3.4	6.9	27.6	37.9	75.9	0.0	17.2	44.8	31.0	93.1
Opolskie	7.1	10.7	32.1	35.7	85.7	7.1	17.9	46.4	21.4	92.9
Kujawsko-Pomorskie	9.1	13.6	15.9	29.5	68.2	9.1	6.8	54.5	20.5	90.9
Warmińsko-Mazurskie	2.6	10.5	28.9	34.2	76.3	2.6	7.9	52.6	26.3	89.5
Zachodniopomorskie	2.0	5.9	39.2	39.2	86.3	5.9	19.6	39.2	23.5	88.2
Dolnośląskie	11.4	30.0	27.1	12.9	81.4	7.1	21.4	51.4	5.7	85.7
Pomorskie	0.0	0.0	18.5	48.1	66.7	7.4	0.0	29.6	48.1	85.2
Lubuskie	2.8	8.3	16.7	30.6	58.3	8.3	16.7	16.7	41.7	83.3
Łódzkie	7.7	23.1	23.1	19.2	73.1	3.8	15.4	38.5	23.1	80.8
Śląskie	8.8	14.7	20.6	8.8	52.9	14.7	20.6	26.5	17.6	79.4
Podlaskie	10.7	21.4	25.0	17.9	75.0	0.0	10.7	57.1	7.1	75.0
Podkarpackie	5.7	5.7	2.9	48.6	62.9	2.9	8.6	17.1	42.9	71.4
Małopolskie	7.3	12.2	14.6	31.7	65.9	4.9	12.2	19.5	34.1	70.7
Mazowieckie	3.3	6.7	11.7	20.0	41.7	5.0	13.3	20.0	25.0	63.3
Wielkopolskie	6.7	6.7	12.4	24.7	50.6	4.5	4.5	16.9	36.0	61.8
Total	6.2	12.0	21.1	27.6	66.8	5.9	13.5	34.2	25.9	79.5

Source: own calculations based on BDL data of the Central Statistical Office.

The described processes in small towns of regressive types, like in the case of progressive towns, confirm the dominance of negative demographic trends occurring in the studied settlement units. An increase in the number of small towns characterized by a drop in population, caused not only by a negative natural increase, but most of all by a growing significance of negative net migration, was observed. It was this component of population growth in the analyzed period that influenced the shaping of demographic types of small towns in Poland the most. At the end of the analyzed period, the share of small towns characterized by a negative natural increase was between 44% and 80% of all the settlement units covered by this study. The highest share in 2013 could be observed in Warmińsko-Mazurskie

(78.9%), Pomorskie (77.7%), Lubelskie (75.8%) and Kujawsko-Pomorskie (75%) voivodeships, the lowest – in Śląskie (44.1%) and Mazowieckie (45%) regions.

It may be stated that the growing impact of negative net migration on shaping the population sizes in the studied towns was diversified spatially and depended mainly on the level of economic development of the regions.

## **7. CONCLUSIONS**

As a result of demographic processes taking place in Polish cities between 2003 and 2014, there was a slight increase in population potential of centres with less than 20 thousand inhabitants. Small towns increased their share in the population structure of the urban settlement network from 20.9% to 21.4%. These changes did not result from a gain in real increase of population of particular centres. They were mainly caused by an increase in the number of the smallest towns which occurred as a result of gaining town status by the rural settlements, and transition of cities from higher to the lowest size class (up to 20 thousand inhabitants).

The proportions between progressive and regressive types of small towns in Poland between 2004 and 2013 changed. The share of towns of progressive character decreased from around 33% in 2004 to around 20% in 2013. The most significant drop was noted in Świętokrzyskie, Lubelskie and Kujawsko-Pomorskie voivodeships, and the smallest in Małopolska and Zachodniopomorskie. The significance of small towns of regressive character increased. At the beginning of the analysed period they accounted for around 67%, while at the end for around 80% of the settlement units. The biggest rise in the share of small towns of regressive character was observed in Mazowieckie, Śląskie and Lubuskie regions, the smallest – in Zachodniopomorskie, Dolnośląskie, Małopolskie and Opolskie regions. Only in Podlaskie voivodeship the proportions between the number of centers of regressive and progressive character remained the same in the analyzed period. These processes indicate that negative demographic processes in the analysed period occurred not only in small towns with peripheral location, in which agricultural functions still played a significant role, but also in more and more numerous group of towns located around and within metropolitan areas as well as along main transport routes.

The majority of small towns having progressive character in 2004 represented regressive types in 2013, especially types G and H, which were characterized by a negative migration balance. This turned out to be the main element shaping population trends in the studied settlement units. It may be assumed that it was connected to stage two of the demographic transition which was characterised, among others, by intensified migration and natural increase below the level granting generation replacement.

Of the cities having regressive character in 2004 the majority remained in this set at the end of the analysed period. In almost half of them changes to other regressive types occurred, most often to type G. Only in a few small towns of this set (around 9%) a positive demographic change resulting in population growth was observed in 2013. The described processes of increasing share of regressive units in the set of small towns, especially types G and H, confirm the existence of negative demographic trends, which are characteristic of the second stage of the demographic transition.

Not only a negative natural increase, but above all a negative net migration rate had a very strong influence on shaping the population of small towns in Poland between 2004 and 2013. Their importance in shaping the demographic trends of small towns justifies negative forecasts for the future. In line with Ravenstein's (1885) theory, it is mostly young people, especially women, who emigrate. It results in a decrease of birth rate and increase in depopulation pace in the following years. It should be assumed that migration from small towns in search of better living standards constitutes the beginning of the negative change spiral. Hoekveld (2012) and Haase *et al.* (2013) stated that the direct, negative consequence of the emigrant outflow is a drop in demand for goods and services which leads to limitation of entrepreneurship and the degree of usage of social and economic infrastructure of the city. At the same time it favors liquidation of particular economic entities and institutions. The situation results in labour supply decrease, unemployment increase and cities' income decrease, and causes another emigrant wave. Breaking this vicious circle is another important challenge for municipal governments in small towns.

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