

# Demographic and educational structural changes in Polish villages, 2000–2021

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**Citation:** Wrzochalska, A.; Łaba, S. (2022). Demographic and educational structural changes in Polish villages, 2000–2021. *Ikonomika i upravljenje na selskoto stopanstvo*, 67(4), 45-59 (Bg).

## Abstract

The aim of the publication is an analysis of changes in the demographic and educational structure of Polish villages in the past twenty years. The level of formal education of rural population was also analyzed, including issues related to adult education and digital skills of the society. A forecast for some demographic indicators until 2050 was also considered. Comparisons were made regarding an urban population group, and in some cases with respect to the entire population of the country.

**Key words:** rural areas; rural society; demography; education; digitization; Poland

## Демографски и образователни структурни промени в полските села, 2000–2021 г.

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## Резюме

Целта на публикацията е анализ на промените в демографската и образователна структура на полските села за последните 20 години. Беше анализиран демографски потенциал, образователно равнище на населението в Полша, развитие на дигиталните компетентности. Разгледана беше и прогноза за някои демографски показатели до 2050 година. Направени са сравнения на селското население и жителите в градовете, а в някои случаи и по отношение на цялото население на страната.

**Ключови думи:** селски райони; селско население; демография; образователно равнище; дигитализация; Полша

## Introduction

For many years, residents in rural areas have constituted a significant percentage of the coun-

try's population, as two out of five Poles live in rural areas. Currently, almost every fifth person aged 15–64 has a higher level of education. Since the beginning of the 21st century, there has been

a significant development of digital competences of society. At the same time, differences in relation to city dwellers both in terms of educational aspirations and digital skills decreased. However, the aging of population was clearly visible in both communities, while rural areas are characterized by relatively better demographic indicators. The article is an attempt to define the image of a rural inhabitant in Poland on the threshold of the third decade of the 21st century and the changes that have taken place in this respect over the past twenty years.

**Material and methods:** the work uses comparative and statistical-descriptive analyzes of the available data. The research material consists of Statistics Poland data, Eurostat data and publications concerning the researched subject. The analysis mainly covers the years 2000–2021.

## **Results**

### ***1. Changes in the population status in 2000–2021***

In 2021, rural residents accounted for 40.2% of the total population of Poland. Since 2000, the population in rural areas has increased by more than 745,000 people and according to the Statistics Poland data, in 2021, nearly 15.4 million people lived in rural areas (Table 1). Throughout the analyzed period, a gradual decrease in the number of urban residents was observed, with a simultaneous increase in the number of people living in rural areas, mainly around large, urbanized areas. Thus, internal migrations had the greatest impact on the increasing overall rural migration balance (Table 2). Gender balance was noticeable in rural areas throughout the analyzed period. There were 101 women per every 100 men. In 2020, there were 111 women per 100 men in cities, this has been the case since 2004, earlier (i.e., in 2000–2004), the indicator had been 110 women per 100 men. The gender balance concerned the entire rural population, however, differences in individual age groups were noted. As in the case of the urban population, the advantage of men over women was visible in younger age groups. In 2000, in rural population, there were more women in the 55–59 age group, and in the

case of urban population, this phenomenon was already visible in the 30–34 age group. In 2020, the numerical advantage of women over men in rural areas was observed relatively later than in 2000, i.e., in the 65–69 age group, and in the city, it was at the same level as in 2000, i.e., the phenomenon concerned the 30–34-year-old age group. As a result of the average longer life expectancy of women, feminization rates were significantly higher in the older age groups. In rural areas, there were 124 women per 100 men in the 70–74 age group in 2021, and as many as 193 in the 80–84 age group.

The steadily increasing life expectancy in Poland is a positive sign of demographic changes. In 2020, as compared to 2000, the length of life of women and men in the city and in rural areas increased by nearly 3 years. For girls born in rural areas in 2021, it is predicted that they will live 80.6 years, while for boys it will be 72.1 years. People over 60 have yet to live – in the case of men 17.4 years and in the case of women 23.0 years. In 2000, the values were respectively 16.7 years (men) and 18.6 years (women). No significant differences were observed in the life expectancy of urban and rural residents. It should be noted that the Covid–19 pandemic lowered the indicators in relation to 2019 (Table 3). It also influenced the population growth in both communities (Table 2 and Figure 1).

In 2015–2021, rural areas were characterized by relatively better demographic indicators than in cities, mainly in relation to the age structure of inhabitants. Percentages of people in pre-working age and working age were higher than in urban areas, with a lower share in the group of people in post-working age. Consequently, in rural areas the number of people in non-working age per 100 people in working age was lower than in urban areas, and the ratio of people aged over 65 in relation to the number of children and adolescents was better. It indicates a more favorable size of selected demographic indicators (Table 1). However, in the period 2000–2021 the number of people aged 65 and more per 1000 children (up to 14 years old) increased by 366 people. It should be emphasized, however, that in the analyzed period, in both groups, there was an annual decline

**Table 1.** Population in the rural and urban areas in Poland in 2000–2021

**Таблица 1.** Изменение на население в селата и градовете на Полша в периода 2000–2021 г. (хил.)

Specification Показатели	2000	2005	2010	2015	2020	2021*	Change Промяна 2000–2021
Population in rural areas (in thousands) Население в селата (хил.)	14584	14733	15101	15271	15360	15329	745
Population in rural areas (in %) Население в селата (%)	38,1	38,6	39,2	39,7	40,1	40,2	2,1
People aged 65 and over per 1000 children aged 0–14 Лица на възраст на 65 и повече години на 1000 деца на възраст 0–14 години							
rural areas селата	604	720	764	852	961	970	366
urban areas градовете	684	903	1000	1213	1399	1417	733
Population at non-working age per 100 persons at working age Население в „зависимите“ възрасти на 100 лица от „независимите“ възрасти							
rural areas селата	76	65	59	58	63	63	-13
urban areas градовете	58	52	53	61	72	72	-14
Working and non- working age population (rural areas) Население по възрастови групи (селата)							
pre-working age под трудоспособна	27,6	23,8	21,5	19,9	19,5	19,6	-8,0
working age трудоспособна	56,8	60,8	63,1	63,1	61,5	61,3	-4,5
post-working age над трудоспособна	15,6	15,4	15,4	17,0	19,0	19,1	3,5
Working and non-working age population (urban areas) Население по възрастови групи (градовете)							
pre-working age под трудоспособна	20,9	17,3	15,8	16,7	17,3	17,3	-3,6
working age трудоспособна	60,2	62,7	60,5	62,0	58,2	58,0	-2,2
post-working age над трудоспособна	18,9	20,1	23,7	21,3	24,5	24,7	5,8

\* As of June 30, 2021. / Данни за 30.06.2021 г.

Source: Based on data from the Central Statistical Office of Poland, GUS 2000–2022.

Източник: Данни на ГСУ 2000–2022 г.

in the population in the age group of children and adolescents (0–17 years) and in the mobile working age population, with an increase in the number of people in older age groups.

## 2. Population by selected age groups

From the point of view of the impact of demographic conditions on the country's economy, both the structure of the total population by age

**Table 2.** Major data on the population size: vital statistics and migration in 2000–2021 (in thousand)  
**Таблица 2.** Изменение на населението в селата и градовете в периода 2000–2020 г. (хил.)

Years Години	Population balance Изменение на населението						
	Total Общо	Natural increase Естествен прираст			Net migration Салдо на миграцията		
		Natural increase Естествен прираст	Live births Живородени	Deaths Починали	Total Общо	Internal Вътрешна	International Задгранична
rural areas / селата							
2000	21,1	20,2	170,0	149,8	0,9	4,2	-3,3
2005	34,5	4,3	153,2	148,9	30,2	32,6	-2,4
2010	66,4	20,4	171,4	151,0	46,0	46,0	0,1
2011	51,9	12,7	162,7	150,0	39,1	39,8	-0,7
2015	19,1	-0,9	151,9	152,9	20,0	24,1	-3,8
2019	29,7	-1,9	154,7	156,5	31,6	29,4	2,2
2020	6,3	-34,8	147,2	182,0	41,1	39,4	1,6
urban areas / градовете							
2000	-30,5	-9,9	208,3	218,2	-20,6	-4,2	-16,4
2005	-51,3	-8,2	211,2	219,4	-43,1	-32,6	-10,5
2010	-33,7	14,5	241,9	227,5	-48,1	-46,0	-2,2
2011	-43,3	0,2	225,7	225,5	-43,5	-39,8	-3,7
2015	-11,3	24,7	217,4	242,1	-36,0	-24,1	-11,9
2019	-58,3	-32,9	220,3	253,2	-25,4	-29,4	4,0
2020	-123,8	-87,2	208,1	295,4	-36,6	-39,4	2,9

Source: Based on data from the Central Statistical Office of Poland, Demographic Yearbook 2021 of the Republic of Poland, GUS.

Източник: По данни на ГСУ, Rocznik Demograficzny 2021 г.

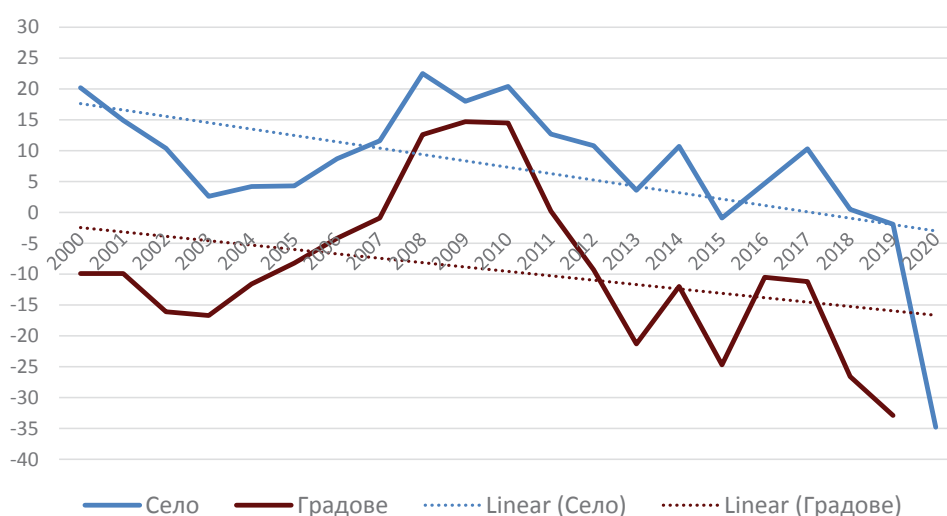


Fig. 1. Natural increase in rural and urban areas in 2000–2020

Фиг. 1. Естествен прираст на населението в селата и градовете в периода 2000–2020 г.

Source: Based on data from the Central Statistical Office of Poland, Demographic Yearbook 2021 of the Republic of Poland, GUS.

Източник: По данни на ГСУ, Rocznik Demograficzny 2021 г.

and the changes in proportions between groups of people of working and non-working age are important. The pre-working age population in rural areas in 2021 amounted to nearly 3 million, which accounted for 43.1% of the Polish population in this age group. The share of pre-working age people in the total rural population was 19.6%, which means that since 2000 this age group has decreased by 8.0 pp, and since 2005 by 4.2 pp. Despite a significant decrease in the share of children and adolescents, Polish rural areas are still characterized by a greater share of this population group, as compared to city dwellers. The decrease in the share of people under 18 in the total population, both in rural and urban areas, in recent years also resulted from the fact that people who were born in the first half of the 1980s, i.e., during the baby boom, entered the working age.

In 2021, more than 9.4 million people of working age lived in rural areas, which means that it was 41.2% of the total population of working age in Poland. As compared to 2000, the working age population in rural areas increased by more than 1,164,000 (by 14.1%), and, as compared to 2005, an increase by 486,400, i.e., 5.4%, was recorded. In the years 2000–2021, along with increased the number of people of working age, the share of this population group in the total number of rural residents also increased by 4.5 pp.

The post-working age population in rural areas in 2021 amounted to more than 2.9 million people, which accounted for approximately 42.5% of the Polish population in this age group. The share of people aged 60/65 and more among the rural population amounted to nearly 19.1%. In urbanized areas, this figure was 24.7%. As compared to 2000, this percentage increased in both communities – in rural areas by 3.5 pp, and in cities by as much as 5.8 pp. Intensified aging of inhabitants, in both communities, was visible mainly in the second decade of the 21st century.

When assessing the impact of demographic characteristics of the population on economic conditions, the demographic dependency ratio is usually used, indicating how many younger people, i.e., those under 18 years of age, and older people, aged 60/65 and more, there are per

100 people in working age. In rural areas, in 2021 this indicator was 63, which means that it has decreased by 13 points since 2000, but it has started to increase systematically since 2016. The general decrease in the burden of people of working age with people of non-working age in rural areas in the years 2000–2021 was caused by increased number and percentage of people of working age observed in recent years.

The demographic dependency ratio calculated for the population living in rural areas was lower in 2021 than in urban areas (63 against 72). Until 2012, cities maintained a lower burden of non-working age people than rural areas, and then, from 2013, there has been a systematic increase in this ratio. Differences in the level of the ratio between rural areas and cities resulted from the different shaping of the percentage of people in the working age (Table 1 and Table 4). Even though a smaller percentage of the working-age population lived in rural areas, a slight increase in this group of the total population in Poland in recent years was caused mainly by the rural population.

### **3. Population aging**

It should be emphasized that, similarly to cities, in rural areas in the analyzed period, there was a clear aging of the society, and this phenomenon concerned both the entire population and the group of people associated with agricultural. The aging of rural areas results from the negative natural increase observed for a long time (negative balance of the number of births in relation to the number of deaths (Table 2 and Figure 1) and the outflow of people in many regions, especially in the working age. Population aging, according to the accepted definitions, means increasing the percentage of elderly people while reducing the percentage of children. In Poland, in rural areas and in cities, in the analyzed period, the percentage of people in the senior age was gradually increasing. In rural areas, the percentage of people over 65 years of age in 2000 was 13%, thus almost twice as high as when, according to the adopted UN criterion, a population is considered old, and in 2021, this percentage reached the level of 17%. In 2000, city pop-

ulation was characterized by the percentage of people aged over 65 at the level of 12%, and by 2021, it increased to the level of 21%. The level of the ratios shows that populations of both urban and rural areas are in their advanced old age phase. This is also confirmed by the median age, which also shows progressive aging of the population. This is an age that one half of the population has not yet reached, and the other half has already reached its end. In rural areas, the total value of this indicator in 2000 was 33.5, reaching the level of 40.0 years by 2020. In the group of men in 2020, it was 39.0 years, 41.2 years for women. In urban areas, the general median age in 2000 was 36.6 years, twenty years later; in 2020 it was 43.1 years (45.1 for women and 41.2 for men).

Quantitative relationships between older and younger groups of people and the possibility of supporting older generations are reflected in support coefficients: the coefficient of potential support and the coefficient of care for parents. The potential support coefficient means the number of people aged 15–64 per 100 people aged 65 and over. On the other hand, the care for parents determines the number of people aged 85 and more per 100 people aged 50–64 (Statistics Poland, 2014). The first of the measures in 2000 was 606 in urban areas and 482 in rural areas. In 2021, it decreased to 311 in the city and to 426 in rural areas. The second coefficient – the care of parents reached the level of 11 in cities and 9 in rural areas in 2021, increasing its value, as compared to previous years. (e.g., 4 in cities and 6 in rural areas in 2004). Forecasts of Statistics Poland until 2050 provide for a further decrease in the level of the potential support coefficient to the level of 169, in total in Poland, and an increase in the care for parents to the level of 38 (Statistics Poland, 2014).

On the other hand, the long-term forecast regarding changes in the structure of rural population by economic age groups indicates a tendency for a dynamic increase in the share of the post-working age population in rural population. It is assumed that people in post-working age in 2050 will constitute almost 27% of the rural community. At the same time, in the face of an increasingly longer period of life and the shifting biolog-

ical limit of aging, the number of seniors who decide to extend the period of economic activity is increasing. It manifests itself particularly strongly in rural areas.

Population aging is an irreversible and common phenomenon, and it is influenced by the development of society (the phase of its development). The main reasons are delaying the age of entering relationships and the age of mothers giving birth to children, fewer births, resulting also in a lower number of potential mothers in the future, low fertility rates and a low birth rate. International migrations, which mainly concern young people and distort the population structure, also have an impact. Progress in medicine, medical care, including prevalence of preventive examinations and increased public awareness of care for health, physical condition, and proper nutrition, caused primarily by the favorable structure of education, both in cities and in rural areas, translate into extending the life of the society. In 2020, a 60-year-old woman residing in rural areas was still to live 23 years, and a man was to live 17.4 years (Table 3). In the case of city population, the indicators were even higher.

Despite increased life expectancy of the population throughout the analyzed period, in 2020 the number of years to be lived, including people over 60, decreased in relation to the previous situation. One of the main causes was the COVID–19 pandemic, which directly contributed to 8.7% of deaths in Poland. In the case of elderly people, it was 9.1% of deaths (Statistics Poland, 2021d).

#### ***4. Selected elements of the demographic forecast until 2050***

According to data from Statistics Poland, in the next twenty years population in Poland will decrease and in 2050 it will reach 33,951,000 inhabitants, i.e., according to the forecast for 2021, it will decrease by nearly 4.2 million inhabitants (Statistics Poland, 2014). The decline in the population will occur mainly in urbanized areas. In rural areas, forecasts predict a decrease in the number of inhabitants in 2050, as compared to 2021 by only 204,000, with a decrease in the number of people only after 2040. Decreased number of inhabitants will mainly concern the working age

**Table 3.** Life expectancy at age specified in Poland in 2000–2020

**Таблица 3.** Продължителност на живота (в години) в Полша, в периода 2000–2020 г.

Specification Показатели	2000	2005	2010	2015	2019	2020
Rural areas / Селата						
Newborn baby boy Новородено момче	69,4	70,3	71,4	73,0	73,4	72,1
Newborn baby girl Новородено момиче	78,4	79,6	80,7	81,6	81,8	80,6
Man aged 60 Мъж на възраст 60 години	16,7	17,3	17,8	18,5	18,7	17,4
Women aged 60 Жена на възраст 60 години	18,6	22,7	23,4	24,0	24,1	23,0
Urban areas / Градовете						
Newborn baby boy Новородено момче	70,0	71,2	72,6	74,0	74,5	72,9
Newborn baby girl Новородено момиче	77,8	79,3	80,6	81,5	81,7	80,8
Man aged 60 Мъж на възраст 60 години	16,8	17,7	18,6	19,3	19,5	18,2
Women aged 60 Жена на възраст 60 години	21,4	22,7	23,5	24,2	24,2	23,4

Source: Based on data from the Central Statistical Office of Poland, GUS 2000–2022.

Източник: Данни на ГСУ 2000–2022 г.

**Table 4.** Selected demographic indicators in rural and in urban areas in 2015–2021

**Таблица 4.** Население в „зависимите“ възрасти (на 100 лица от „независимите“ възрасти), по местоживеене в периода 2000–2011 г.

Years Години	Demographic dependency ratio Нетрудоспособни „зависими“ възрасти – общо		Pre-working age population for 100 people in working age Под трудоспособна възраст		Post-working age population for 100 people in working age Над трудоспособна възраст	
	Rural areas	Urban areas	Rural areas	Urban areas	Rural areas	Urban areas
	Селата	Градовете	Селата	Градовете	Селата	Градовете
2000	77	58	49	35	28	23
2005	65	52	39	28	25	23
2010	58	53	34	26	25	27
2015	58	61	31	27	27	34
2020	63	72	32	30	31	42
2021*	63	72	32	30	31	43

\* As of June 30, 2021. / Данни за 30.06.2021 г.

Source: Based on data from the Central Statistical Office of Poland, Statistical Yearbooks of the Republic of Poland, GUS 2000–2022.

Източник: По данни на ГСУ 2000–2022 г.

population. In the urban community in 2050, in relation to 2021, this age group will decrease by approximately 4.4 million, and in rural areas by approximately 1.7 million people. A relatively smaller decline in the population will take place in the group of people in the pre-working age.

In the same period, it will be a loss of 1.3 million for cities, and about 681,000 for rural areas. At the same time, the post-working age popula-

tion will increase in both communities, therefore aging will continue. Already in 2030, 26.3% of rural population and 31.0% in urban areas will be over 60 years of age (Table 5, Table 6). In 2050, these indicators will be even less favorable. The number of hundreds of people in the oldest age groups will also increase, because of which, in 2050, there will be the total of 6.1% of people aged 85 and over in Poland.

**Table 5.** Share of people aged 60 and more in the total population in 2021 and forecast for 2030, 2040 and 2050

**Таблица 5.** Относителен дял на хората на 60 и повече години в общото население през 2021 г. и прогноза за 2030, 2040 и 2050 г.

Specification Показатели	2021	2030	2040	2050
		Forecast Прогноза		
Rural areas Селата	22,4	26,3	31,8	37,8
Urban areas Градовете	27,9	31,0	36,4	42,2

Source: Based on data from the Central Statistical Office of Poland and *Sytuacja osób starszych w Polsce w 2020 r., Analizy statystyczne, GUS, Warszawa, Białystok.*

Източник: По данни на ГСУ и публикация *Sytuacja osób starszych w Polsce w 2020 r., Analizy statystyczne, GUS, Warszawa, Białystok.*

**Table 6.** Forecast of the share of people aged 60 and over in the total population by age groups

**Таблица 6.** Прогноза за относителен дял на хората на 60 и повече години в общото население, по възрастови групи

Specification Показатели	Total Общо	Total Общо	From the total number От общия брой		Total Общо	From the total number От общия брой	
			Rural areas Селата	Urban areas Градовете		Rural areas Селата	Urban areas Градовете
			2021	2030		2050	
Total Общо	<b>25,7</b>	<b>29,0</b>	11,0	18,0	<b>40,4</b>	16,8	23,5
60–64	<b>6,9</b>	<b>5,7</b>	2,5	3,3	<b>7,7</b>	3,4	4,3
65–69	<b>6,6</b>	<b>5,7</b>	2,4	3,3	<b>8,5</b>	3,6	4,9
70–74	<b>5,1</b>	<b>6,2</b>	2,4	3,9	<b>7,7</b>	3,2	4,5
75–79	<b>2,7</b>	<b>5,4</b>	1,8	3,6	<b>6,1</b>	2,6	3,5
80–84	<b>2,2</b>	<b>3,5</b>	1,2	2,4	<b>4,3</b>	1,8	2,5
85 and over	<b>2,1</b>	<b>2,4</b>	0,8	1,6	<b>6,1</b>	2,3	3,8

Source: Based on data from the Central Statistical Office of Poland and *Sytuacja osób starszych w Polsce w 2020 r., Analizy statystyczne, GUS, Warszawa, Białystok.*

Източник: По данни на ГСУ и публикация *Sytuacja osób starszych w Polsce w 2020 r., Analizy statystyczne, GUS, Warszawa, Białystok.*



Progressing aging of the population will increase the demographic dependency ratio in cities to 76 and in rural areas to 67 in 2030. In 2050, there will be the total of 105 non-working-age people per 100 working-age people in Poland.

### 5. Level of education of the rural society

The favorable changes taking place in the education and upbringing system improved the level of education of the society in Poland, including the rural society. For many years, there have been significant disproportions in the education of population between rural and urban areas, even though in rural areas, as in cities, educational aspirations are increasing, and the disproportions regarding the level of education are decreasing, as compared to previous years.

In 2000–2021, a systematic increase in the share of people with higher education in the population of people aged 15–64 was observed, both in urban and rural areas. As compared to 2000, the percentage of population with higher education in rural areas increased more than fivefold. Percentage of rural population with post-secondary and secondary education increased, while percentage of people with the lowest level of education decreased. It should be assumed that this phenomenon was strongly associated with changes in the demographic structure, as this type of education concerned mainly those who attended schools in the interwar period. All the positive changes are observed both in the group of rural women and in the case of men. However, there are still disproportions regarding city population (Table 7), but it

**Table 7.** Education level of the population aged 15–64 in rural and urban areas in 2000–2021 (in %)   
 **Таблица 7.** Образователно равнище на населението на възраст 15–64 години в периода 2000–2021 г., по местоживене (в %)

Years Години	Higher Висше	Post-secondary and secondary Professional Полувисше и средно професионално	Secondary Professional Средно професионално	Secondary Средно (лицей)	Basic vocational Основно професионално	Lower secondary, primary, incomplete primary Гимназиално и основно
Rural areas / Селата						
2000	3,5	18,6	17,0	4,5	36,7	36,7
2004	5,8	19,7	17,6	6,1	36,8	31,7
2010	10,4	22,3	20,0	8,2	34,1	25,0
2015	14,6	23,3	21,1	8,8	32,7	20,5
2020	18,7	24,7	22,6	9,4	30,5	16,7
2021	18,6	25,4	23,3	10,1	29,3	16,5
Urban areas / Градовете						
2000	12,3	28,8	25,4	10,7	27,5	20,8
2004	17,0	27,5	23,7	12,3	25,5	17,7
2010	25,0	26,0	22,2	13,1	22,3	13,7
2015	31,0	24,6	21,0	11,9	20,8	11,7
2020	36,3	24,3	20,9	11,2	18,0	10,2
2021	36,7	24,3	20,8	11,4	17,2	10,5

Source: based on data from Local Statistics Office of the Central Statistical Office of Poland, (BDL GUS,) (accessed June 21, 2022).

Източник: По данни на ГСУ (регионални отделения), (данни, изтеглени на 21.06.2022 г.).

should be emphasized that the differences are systematically decreasing in relation to the previous years.

It should be emphasized that availability of jobs for university graduates is much lower in rural areas than in cities. Nevertheless, the process of acquiring higher education is still important in society. In recent years, there has been a relatively small increase in the enrollment rate at this level of education. According to the data of Statistics Poland (Statistics Poland), this ratio increased by 1.1 percentage points in academic years 2016/17–2020/21 and in the academic year 2020/2021 it reached the level of 37.1%. In relation to the group of men 30.2% and women 45.0%, the percentage of rural population with post-secondary and secondary education also increased, while the percentage of people with the lowest level of education decreased.

It is understandable that in Poland and other countries the emphasis is mainly on education and training of children and young people who are subject to compulsory education. However, in the modern world, the pace of the so-called knowledge aging is relatively rapid, especially regarding expertise. Therefore, learning should not be equated with any one separate stage of life. A person must be prepared for continuous improvement of competences – also in adulthood and seniority (Wrzochalska, 2014). Inclusion of older

people in lifelong learning is also a very important factor that lets this group of people remain on the labor market, as low qualifications, lack of skills and the possibility of supplementing them are important reasons why employees in Poland are relatively early, as compared to other countries, excluded from the labor market. The process of improving qualifications of adults in Poland is still selective and has a relatively small range (Table 8).

According to the results of the Labor Force Survey (LFS), in Poland in 2020 only 3.7% of people aged 25–64 declared participation in education, which included formal learning (education in schools and higher education) and education outside the formal (participation in various types of courses and training). In 2020, the outbreak of the COVID–19 pandemic also contributed to the reduction of this indicator. However, the situation has recently popularized the e-learning system, also in relation to training courses aimed at adults, and it can be expected that in the coming years this indicator will improve.

The issue of educating adults, including the rural population, should be considered on many levels. The lifestyle of inhabitants in urban and rural areas is becoming uniform, an increasingly smaller percentage of the population works in agriculture, in simplified terms, it can be empha-

**Table 8.** Education of adults aged 25–64, 2015–2020

**Таблица 8.** Обучение на възрастните хора на възраст 25–64 години, в периода 2005–2020 г.

Specification Показатели	2015	2016	2017	2018	2019	2020
in percents / в проценти						
Poland Полша	3,5	3,7	4,0	5,7	4,8	3,7
of which to females в това число жени	3,8	4,0	4,4	6,3	5,4	4,3
European Union Европейски съюз	10,7	10,8	10,9	11,1	11,3	9,2
of which to females в това число жени	11,7	11,7	11,8	12,1	12,4	10,0

Source: (GUS, 2019). *Kapitał ludzki w Polsce w latach 2014–2018 and (GUS, 2021a). Kapitał ludzki w Polsce w latach 2016–2020.*

Източник: (ГСУ, 2019). *Капитал людски в Полска в латех 2014–2018 и ГСУ (2021а). Капитал людски в Полска в латех 2016–2020.*

sized that only a few professionally trained farmers in one village are involved in running farms (Karwat-Woźniak, 2013). Therefore, several non-agricultural jobs are created in rural areas and there are also non-agricultural jobs in nearby towns. Hence, expanding educational competences or the level of formal education of the rural population to increase their importance on the labor market in the city and in rural areas is very important.

The first level of the education system, i.e., pre-school education is an important aspect related to the level of education of the society. It applies to children aged 3-5 and 6-year-olds covered by a compulsory one-year pre-school preparation. Providing the youngest with better access to education has a particular impact on the intellectual abilities of a person, which begin to form in the first years of life (Wrzochalska, 2014). In the 2020/21 school year, 87.2% of children aged 3-5 were covered by pre-school education (in rural areas – 67.7%). In the 2014/15–2020/21 school years, a systematic increase in the availability of this form of education was observed, expressed as the number of children aged 3–5 per one place in pre-school education institutions (a decrease in the value of the indicator from 1.17 in the 2014/15 school year to 0.89 in the 2018/19

school year) and an increase in the share of children aged 3–5 covered by pre-school education (by nearly 7 percentage points). The percentage of the youngest children covered by education at this level is still lower in rural areas than in cities. It should also be emphasized that problems with pre-school care do not apply to all rural areas to the same extent. Worse access to public services is particularly visible in the so-called peripheral rural areas.

### 6. Development of digital competences of the rural population

At the same time, the country (including rural areas) has witnessed development of a modern and cheap internet connection infrastructure. One of the most important determinants of adaptation to our functioning in modern society is access and the ability to use new technologies. Especially in recent years, there have been positive changes in relation to civilization competences understood as the ability to use digital technologies by the rural population

The Internet is primarily used as a tool to make life easier: to send and receive e-mails, search for information about goods and services, purchase goods and services, or search for health information and use several other servic-

**Table 9.** Individuals aged 16–74 using the Internet by frequency of use, 2005–2020

**Таблица 9.** Лица на възраст 16–74 години, ползвали интернет, по честота на употреба, 2005–2020 г. (%)

2005		2010		2015		2020	
Rural areas Селата	Urban areas Градовете	Rural areas Селата	Urban areas Градовете	Rural areas Селата	Urban areas Градовете	Rural areas Селата	Urban areas Градовете
Every day or almost every day Всеки ден или почти всеки ден							
*	*	30,3	49,0	41,6	58,9	63,6	78,2
At least once a week, but not every day Най малко един път през седмица, но не всеки ден							
*	*	13,2	12,1	14,4	11,4	11,1	7,6
Less than once a week По-малко от веднъж седмично							
*	*	*	*	2,6	4,1	1,7	2,0

\* no data / няма данни

Source: Based on data from the Central Statistical Office of Poland, Statistical Yearbooks of the Republic of Poland, GUS, 2009, 2010, 2011, 2021.

Източник: Данни на ГСВ, Roczniki Statystyczne RP, GUS, 2009, 2010, 2011, 2021.

es. At the same time, differences between the distinguished urban and rural population persist throughout the analyzed period (2005–2018), even though the scale of the spread is gradually decreasing (Table 9).

The analysis of the purposes of using the Internet by rural residents clearly indicates an increasing percentage of people using e-mails, Internet banks, instant messaging or searching for necessary information, e.g., on health (Table 10).

**Table 10.** Individuals aged 16–74 using the Internet by purpose of private use, 2005–2020

**Таблица 10.** Лица на възраст 16–74 години, ползвали компютър и интернет (видове ползване), 2005–2020 г. (%)

2005		2010		2015		2020	
Rural areas Селата	Urban areas Градовете	Rural areas Селата	Urban areas Градовете	Rural areas Селата	Urban areas Градовете	Rural areas Селата	Urban areas Градовете
Sending/receiving e-mails Получаване и изпращане на електронна поща							
13	31	35,5	55,0	42,8	60,8	56,9	71,9
Telephoning or video calls over the Internet Обаждане през интернет, видеоконференции							
3,8	9,0	15,0	23,0	21,1	31,6	49,3	58,8
Using social networking sites / participation in chats, discussion forums Участие в социални мрежи, дискуссионни групи и т.н.							
13,2	22,8	24,0	30,4	37,8	43,6	53,19	55,9
Reading information, newspapers or magazines online Четене на вестници и други списания							
*	*	12,5	20,3	37,2	52,4	58,1	70,3
Uploading self-created content to any website to be shared Публикуване на текстове, снимки, видеоклипове							
*	*	9,3	12,4	10,0	14,0	16,3	19,3
Finding information about goods or services Търсене на информация за стоки и услуги							
10,0	2,03	31,0	44,1	36,6	45,7	57,9	66,0
Purchase of goods and services Покупка на стоки и услуги							
2,0	8,0	13,6	24,0	17,0	28,4	39,1	51,5
Seeking health-related information Търсене на здравна информация							
2	10	19,1	29,0	20,5	33,1	35,9	47,4
Using services of Internet banking Банкови услуги							
2	8	13,9	32,0	19,7	38,2	39,3	56,3
Using services of public administration Публична администрация, услуги							
6	16	18,0	33,9	17,1	32,3	33,7	47,4

\* no data / няма данни

Source: Based on data from the Central Statistical Office of Poland, Statistical Yearbooks of the Republic of Poland, GUS, 2009, 2010, 2011, 2021.

Източник: Данни на ГСУ, Roczniki Statystyczne RP, GUS, 2009, 2010, 2011, 2021.

However, it is still a disadvantageous phenomenon in rural areas, among their inhabitants, that a relatively large percentage of the population do not use a computer and the Internet. According to data from Statistics Poland, in 2018 among the total population of rural areas aged 16–74, the share of people who did not use a computer in the last three months was 32%, and the share of those who did not use the Internet was 29% (the scale of non-use of computers and the Internet in the group of city dwellers was clearly lower and amounted to 21 and 18%, respectively).<sup>1</sup> No use of the Internet in everyday life was mainly motivated by no need and no relevant skills. This mainly concerned people in relatively older age groups (i.e., people aged 55–64 and 65–74), most often with a lower level of education. Older people relatively most often lack basic skills to be activated online.

The significance of the ability to use a computer and the importance of access to the Internet was shown by the outbreak of the pandemic and changes in many aspects of everyday life and functioning in society. No Internet nowadays means exclusion from the education and health care system and a kind of professional and social exclusion.

## Summary

In the analyzed period (2000–2021), rural areas were characterized by relatively better indicators of the age structure of inhabitants than cities. However, in both communities there was an annual decline in the population in the age group of children and adolescents and in the mobile working age population, with an increase in the number of people in older age groups.

Thus, there was a strong tendency pointing to the aging of the society. It is expressed both by a dynamic increase in the absolute number of people from the oldest age groups as well as the share of this group in the entire population. At the beginning of the third decade of the 21st century,

and it is possible that in the following decades, this group of people will play an increasingly important role in shaping the demographic structure of society.

The long-term forecast of changes in the structure of the rural population by economic age groups indicates a tendency for a dynamic increase in the share of the post-working age population in the rural population. It is assumed that people in post-working age in 2050 will constitute almost 27% of the rural community. At the same time, in the face of an increasingly longer period of life and the shifting biological limit of aging, the number of seniors who decide to extend the period of economic activity is increasing. This process manifests itself particularly strongly in rural areas. The situation applies not only to Poland, but also to most countries with a relatively high level of civilization development. Hence, constant development of forms of support and activation of seniors, aimed at improving their quality of life will be an indispensable challenge. First, it is important to take steps to integrate them with the environment in the place of residence.

In Poland, several activities are carried out aimed at improving the quality of life of seniors and their social inclusion, and aid programs are being prepared. Development of telemedicine plays an important role, as it can improve access to specialist care in rural areas. The COVID–19 pandemic has shown how important the e-advice system, or the functioning of e-prescriptions is.

Analyzes have shown that the rural population at the threshold of the third decade of the 21st century fulfills their educational aspirations by increasing their level of education. Currently, every sixth inhabitant of rural areas, aged 15–64, has completed higher education, and every fourth has a semi-higher or secondary vocational education. Educational differences in relation to the population in cities have also significantly decreased.

An efficient education system is one of the conditions for increasing productivity of employees and competitiveness of the Polish economy. Regardless of increasing the average educational results, its important task is to equalize the development opportunities of people further effectively in various environments and areas. Education

<sup>1</sup> *Information society in Poland. Results of statistical surveys from 2014–2018*, Statistics Poland, Warsaw, Szczecin 2018, and *Information Society in Poland. Results of statistical surveys from 2006–2010*, Statistics Poland, Szczecin 2010.

is also of key importance for leveling development disproportions on a regional scale. The most important challenges and problems in this respect include ensuring access to early childhood education in kindergartens for all children; individualization of the education process so that it is adapted to the needs of different students and activities for the dissemination of adult education consisting both in improving accessibility and raising awareness of the benefits of lifelong learning.

It should be emphasized that in the analyzed period there was a professionalization of the farmer profession and a modern farmer managing a farm is aware that running a farm requires constant expansion of knowledge, not only agronomic, but also knowledge of social and political relations, knowledge of legal regulations and the methods of operation of many units and entities dealing with supply and purchase. Knowledge of the issues means development opportunities of a farm and maintaining its position on the market. The above conditions somehow require the need for constant expansion or acquisition of new knowledge and competences. At the same time, in rural areas there is a clearly visible group of people, mainly in relatively older age groups and not directly related to agriculture, who do not know what modern agriculture looks like, what challenges farmers face or what farming and animal breeding currently means.

Rural residents increasingly eagerly and more often use the benefits of the Internet, and in this respect the distance has decreased, as compared to the skills of city dwellers. The outbreak of the pandemic highlighted the significant role played by digital technologies, Internet access and the skills of people of all age groups in this field in everyday life. As a result of several educational activities and social development of the country's inhabitants that took place in the analyzed period, an improvement in the society's skills related to the use of computers and the Internet can be expected in the coming years. However, it should be considered that the further development of digitization, including e-services in every field, not only in the education or healthcare system, is inevitable. In the decades to come, new technologies will emerge, creating new digital divisions

and the persistence of e-skills gaps among older generations brought up before the rapid spread of digital technologies. Therefore, the education system constantly at every level must teach the useful application of new digital technologies. Along with the development of digital competences of the society, it is also necessary to develop a system and solutions that will let all rural residents become familiar with the changes that have occurred in the last dozen or so years, not only in rural areas, but primarily in agriculture.

At the beginning of the third decade of the 21st century, every second statistical inhabitant of rural areas is older than twenty years ago. A newborn boy will live 2.7 years longer and a girl 2.2 years longer than newborns born at the beginning of the first decade of this age. Currently, a man aged 60 has 17.4 years to live, and a woman 23.0 years, they will live more than a year longer than their peers in 2000. Over the past two decades, the rural population has pursued its educational aspirations, and currently every sixth inhabitant of rural areas, aged 15–64, has completed higher education, and every fourth has a semi-higher or secondary vocational education. Two out of three rural children aged 3–5 are provided with early education care in kindergartens. Two out of three villagers use the Internet every day or almost every day. More than half of the population aged 16–74 sends or receives e-mail messages, makes phone calls via the Internet, participates in discussion forums, and reads messages.

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