

POPULATION PROJECTION FOR THE MAZOWIECKIE VOIVODSHIP 2014–2050



Mazovian Centre of Regional Surveys

2015

Information has been prepared on the basis of Projection for powiats, cities with powiat status and subregions for the years 2014-2050 published by the Central Statistical Office on December 23, 2014. Projection for powiats is consistent with projection for voivodships for the years 2014-2050 valid from October 1, 2014. Results for the voivodship are in line with the sum of population sizes in respective powiats of the voivodship, and slight differences result from mathematical roundings. The basis for calculations was population by age, sex and powiats as of December 31, 2013, in administrative division valid on January 1, 2014. Projection for subregions (according to NUTS3 classification valid from January 1, 2015) has been prepared by summing up results of respective powiats. Presented data concerning 2013 are actual ones.

There were 5316.8 thousand people inhabiting the Mazowieckie voivodship as of the end of 2013. According to results of long-term population projection, population in the Mazowieckie voivodship will be increasing until 2028, and after the period of growth there will be a decrease in the number of population. Finally, it is anticipated that in Mazovia in 2050 there will be 5318.7 thousand people, i.e. by 1.9 thousand (by 0.4%) more than in 2013. In the whole discussed period population sizes will be higher than in a base year.

Table 1. Population, increase/decrease and changes in size in 2013-2050 in the Mazowieckie voivodship

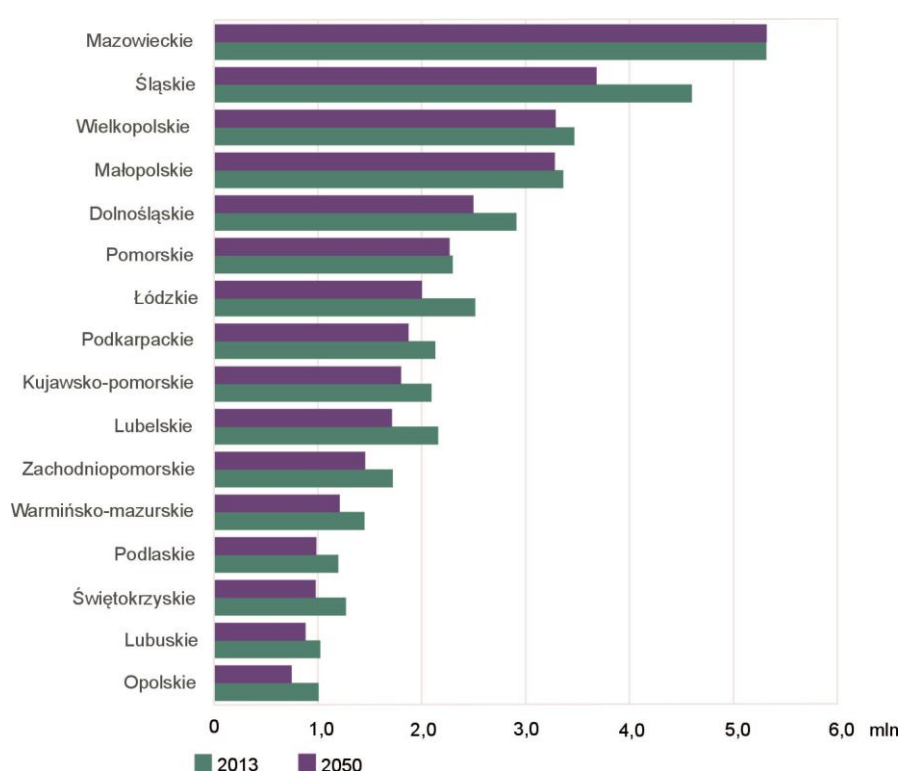
Specification	2013	2014	2015	2020	2025	2030	2035	2040	2045	2050
	Population as of 31st December (in thous.)									
Total	5316,8	5329,7	5341,1	5388,3	5416,0	5418,3	5400,9	5374,7	5347,6	5318,7
Urban areas	3415,2	3422,9	3430,0	3456,2	3463,3	3451,4	3429,0	3405,6	3386,3	3369,0
Rural areas	1901,6	1906,8	1911,2	1932,2	1952,7	1966,9	1971,9	1969,0	1961,3	1949,7
	Change compared with the previous period in %									
Total	x	0,2	0,2	0,9	0,5	0,0	-0,3	-0,5	-0,5	-0,5
Urban areas	x	0,2	0,2	0,8	0,2	-0,3	-0,7	-0,7	-0,6	-0,5
Rural areas	x	0,3	0,2	1,1	1,1	0,7	0,3	-0,1	-0,4	-0,6
	Increase/decrease of population compared with the previous period (in thous.)									
Total	x	12,8	11,5	47,2	27,7	2,3	-17,4	-26,2	-27,1	-28,9
Urban areas	x	7,7	7,1	26,2	7,1	-11,9	-22,4	-23,4	-19,3	-17,2
Rural areas	x	5,2	4,4	21,0	20,6	14,2	4,9	-2,8	-7,8	-11,6
	Changes compared with 2013 (2013=100)									
Total	100,0	100,2	100,5	101,3	101,9	101,9	101,6	101,1	100,6	100,0
Urban areas	100,0	100,2	100,4	101,2	101,4	101,1	100,4	99,7	99,2	98,7
Rural areas	100,0	100,3	100,5	101,6	102,7	103,4	103,7	103,6	103,1	102,5

Similar changes will also be observed in three more voivodships. In the Małopolskie, Pomorskie and Wielkopolskie voivodships there will be a periodic increase in the number of population. Population of the Wielkopolskie voivodship will increase up to 2023, of the Małopolskie until 2026, and of the Pomorskie until 2027. After the growth, there will be a fall in the number of

population. In remaining voivodships a constant, systematic decrease in the number of population in the whole period under discussion is predicted. Finally, in 2050 only in the Mazowieckie voivodship population will be larger than in 2013. In remaining voivodships there will be a decrease in the number of population compared with the base year 2013. The population inhabiting the voivodships: Lubelskie, Łódzkie, Opolskie and Świętokrzyskie will decrease by more than 20% compared with 2013.

As a consequence, Poland's population will fall compared with 2013 by 4545 thous. and at the end of 2050 it will reach 33951 thous., which will represent 88.2% of the state of the base year.

Figure 1. Voivodships by projected population in 2050

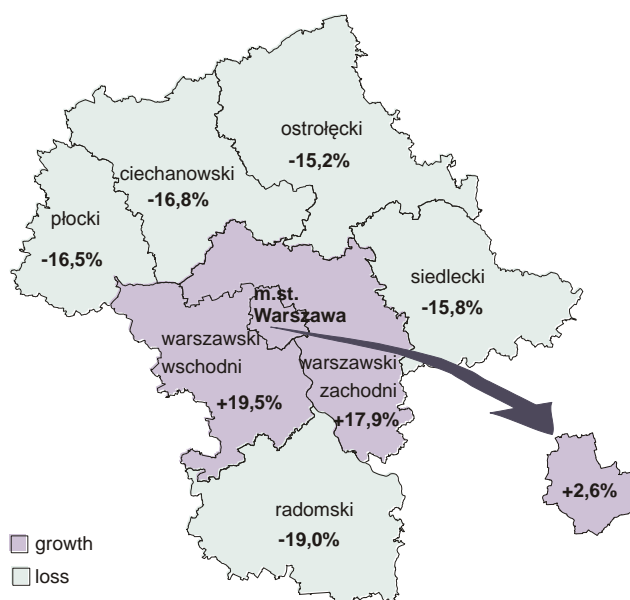


Taking into account the division into urban and rural areas there are some differences in the course of demographic processes in Mazovia. Between 2013 and 2024 the number of urban areas' dwellers will increase. In 2024 in urban areas of the Mazowieckie voivodship will be residing 3463.7 thous. people. Since 2025 until the end of the period under projection a decrease in the number of urban population is anticipated. Finally, in 2050 urban population will amount to 3369.0 thous., i.e. 98.7% of population of 2013. A population increase will be observed in rural areas up to 2035. Over this period size of population will grow by 70.3 thous. compared with 2013, and it will reach 1971.9 thous. From 2036 onwards a fall in the number of population will be continuing, however in the last

year of projection the number of rural population will be higher than in the base year. Finally, in 2050 rural areas will be inhabited by 1949.7 thous. people, which will represent 102.5% of population of 2013.

The Mazowieckie voivodship is very diverse in terms of demographic development. In the cross-section of subregions the population will increase only in three of them. The highest growth, compared with figures from 2013, is anticipated in warszawski wschodni subregion (by 19.5%), slightly smaller in warszawski zachodni (by 17.9%). In Warszawa subregion the number of population will go up by 2.6%. In the remaining five subregions a decrease in population is projected, the highest decrease in radomski subregion (by 19.0%).

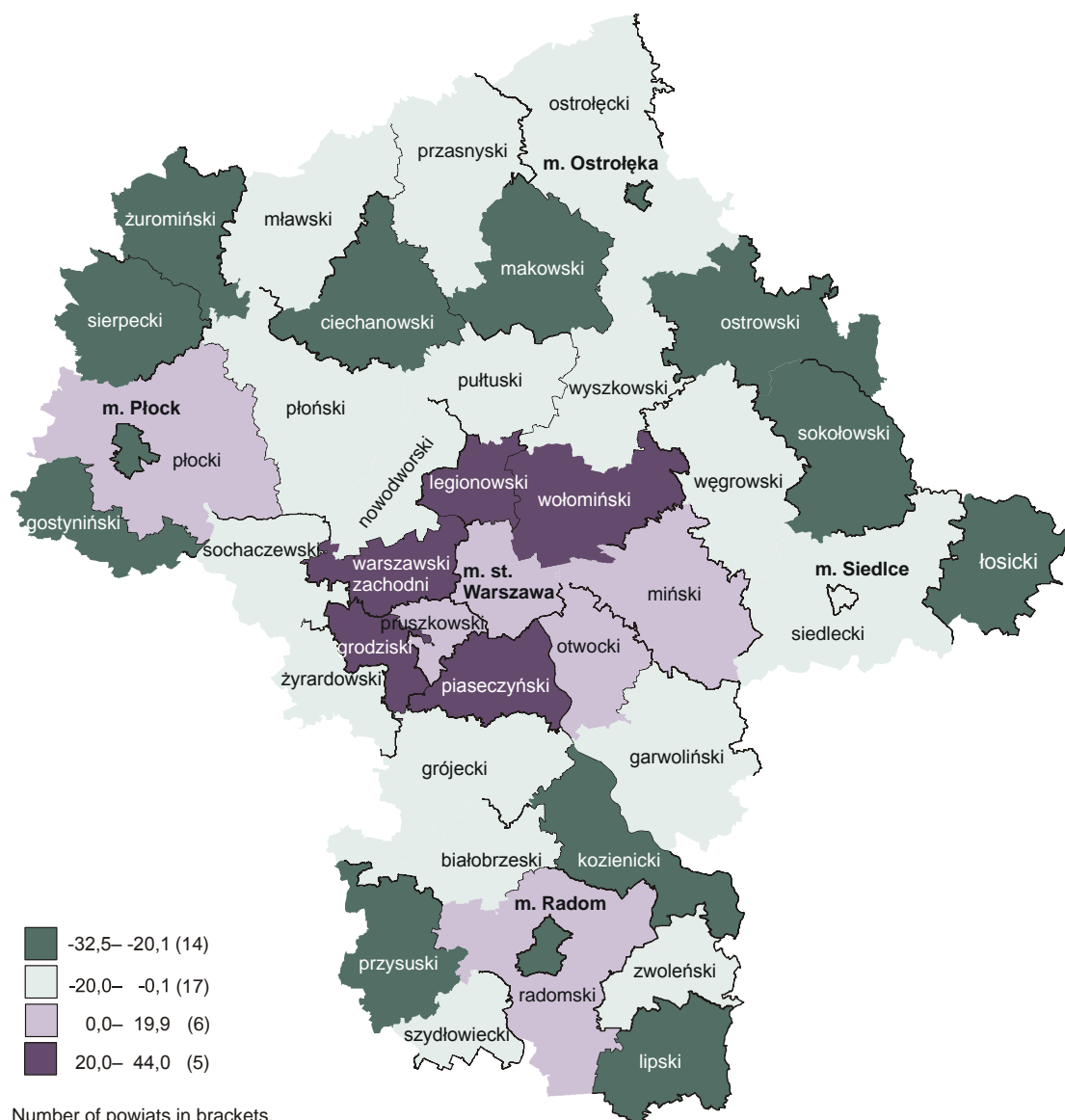
Map 1. Change in the number of population in 2050 compared with 2013 (in %)



With regard to powiats only in eleven of them (amongst forty two), an increase is projected compared with figures from the base year. The number of population will increase in Warszawa subregion and eight adjoining powiats, as well as in plocki and radomski powiats. Significant – over 20% rise of population is projected in powiats: piaseczyński (by 44.0%), wołomiński (by 40.2%), legionowski (by 34.6%), grodziski (by 32.6%) and warszawski zachodni (by 26.4%).

In majority of the Mazowieckie voivodship's powiats the number of population in 2050 will fall compared with 2013. The highest drops will be observed in lipski powiat (32.5%), and in Ostrołęka (30.6%).

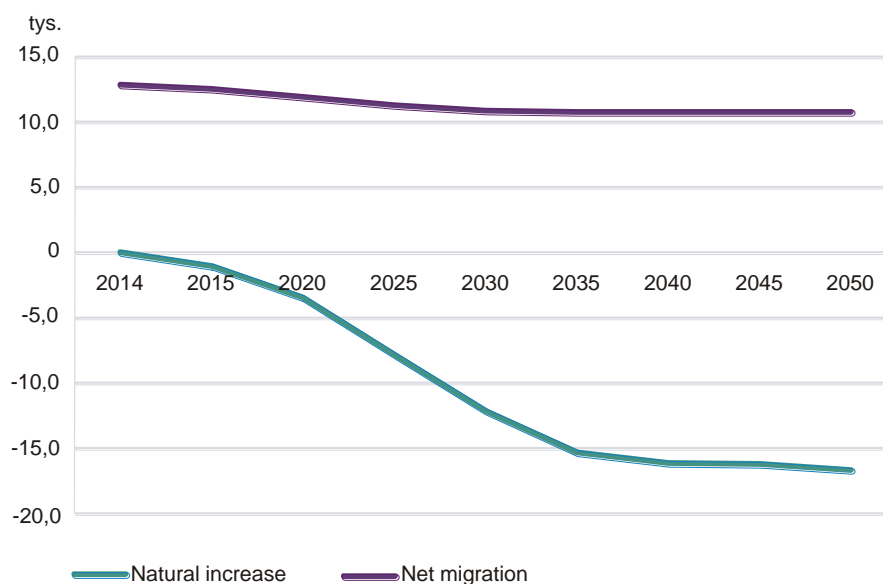
Map 2. Change in the number of population in 2050 compared with 2013 (in %)



Presented changes in the number of population in 2004-2050, result from projected changes in births, deaths and migrations intensity.

Due to adopted assumptions of population projection, changes in the intensity of births and deaths will result in maintenance of positive natural increase (the difference in the number of births and the number of deaths) in Mazovia only until 2014. In the subsequent years – together with continuing unfavorable changes in the age structure of population and decrease in the number of females at reproductive age – a negative natural increase is projected, which will be deepening year after year. The surplus of deaths over births in 2050 will amount to 16.7 thous.

Figure 2. **Natural increase and net migration for permanent residence in selected years of the projection**



Except for natural increase a significant influence on the population size have migrations. The Mazowieckie voivodship for several years is characterized by positive net migration, which is a result of good economic situation of the region. In each year of the projection, it is anticipated that the number of people settling in Mazovia will outnumber people leaving the voivodship, and until 2028 the positive net migration will compensate for the negative natural increase. Not until 2029, despite still positive net migration, the actual increase will be negative and the voivodship population will decrease.

According to the projection results, the significant change will arise in the age structure of population. The process of society ageing will be continuing. According to the definition – ageing of population means that the percentage of elderly population is increasing and at the same time the percentage of children is decreasing. There are numerous measures and classifications of the degree of population ageing, such as structure of population by biological age groups, share of population aged 65 and more in total population or median age of population. Quantitative relations amongst basic age groups of population (aged 0-14 – “children”, 15-64 – “adults”, 65 and more – “the elderly”) allow for defying cross-generational relations among society and assess the level of demographic old age.

The projection results show that until 2050 there will be a significant fall in the number of children (0-14 years) and people aged 15-64, while the number of elderly persons will go up. (Table 2.). Compared with 2013, the loss in children aged 0-14 is estimated at 127.2 thousand which represents 84.6% (88.4% in urban areas, 78.7% in rural areas) of their number in the base year of the projection. Number of persons aged 15-64 will decrease until 2050 by 713.7 thousand, of these by

515.4 thous. in urban areas. In terms of size the resources at the end of projected period will account for 78.1% in urban areas of that from 2013, and in rural areas 84.9%. Until the end of projection horizon it is anticipated that the number of the elderly will go up by 842.8 thous. In 2050 the share of elderly persons in total population will amount to 31.3% by 15.9 p.p. more than in 2013. In the last year of the period under projection the number of persons aged 65 years and more will represent 202.8% of the state from 2013. (in urban areas 195.1% and respectively 219.1% in rural areas).

Table 2. **Projected number of population (in thous.) by biological age groups.**

Specification	2013	2020	2035	2050	2013=100
0-14	825,2	852,2	708,5	698,0	84,6
15-64	3671,9	3514,7	3446,6	2958,1	80,6
65+	819,7	1021,4	1245,8	1662,6	202,8

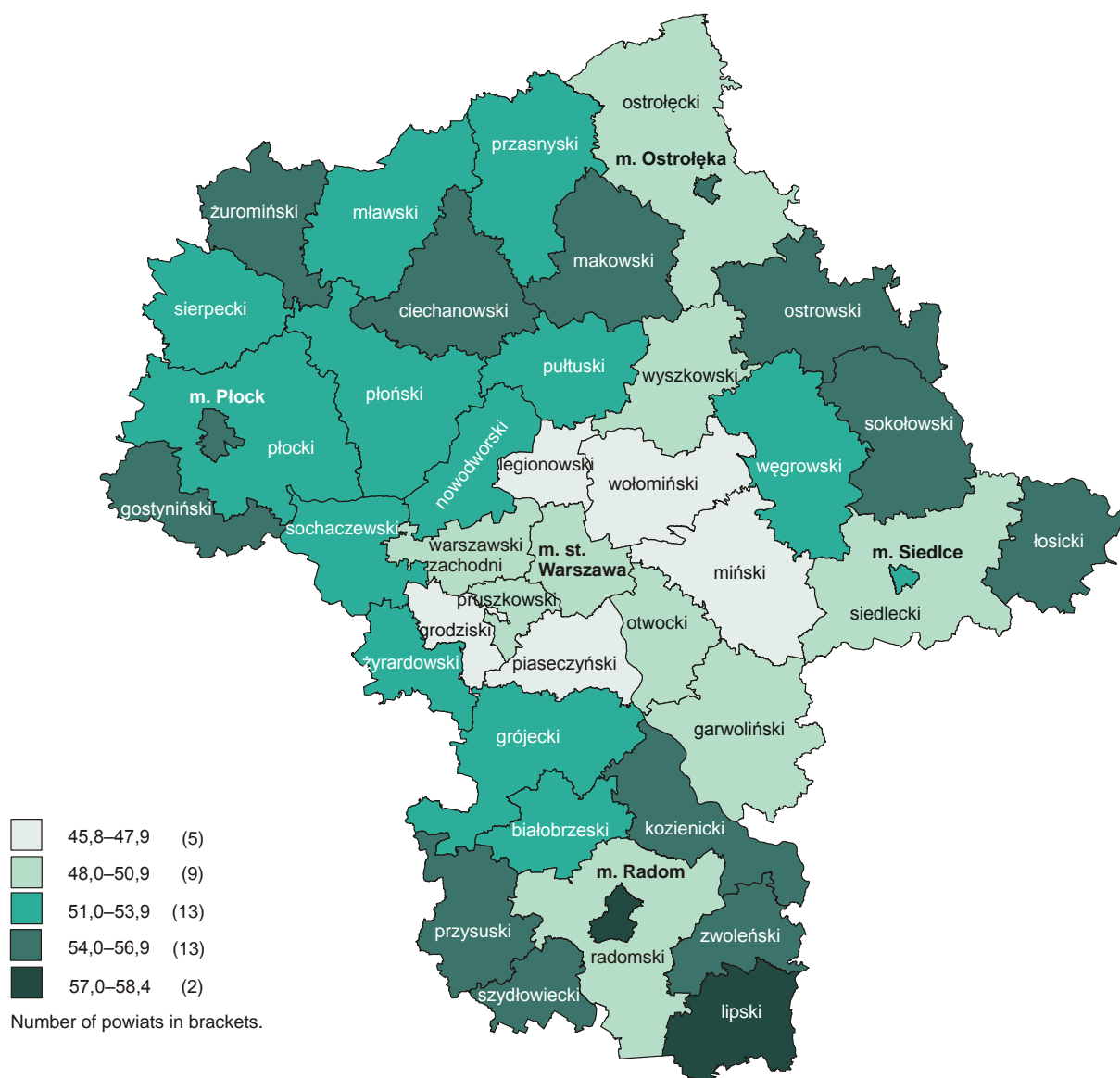
Percentage of persons aged 65 and more is called a rate of ageing of a given population and reflects the intensity of the ageing process. According to the projection results the highest percentage of persons aged 65 and more will occur in radomski (34.5%) and plocki (34.1%) subregions, while the lowest in warszawski wschodni (28.7%) and warszawski zachodni (30.0%) subregions.

In the group of powiats the highest share of population in question will have lipski powiat (38.9%) and cities with powiat status: Radom (38.2%), Ostrołęka (37.7%) and Płock (37.4%). The lowest share will be recorded in powiats adjoining Warsaw: wołomiński (27.2%), legionowski (27.9%) and piaseczyński (28.1%). Powiats with the lowest share of elderly persons are also characterized by high share of children aged 0-14.

One of the measures of population ageing is an ageing index, which defines the cross-generational relations, i.e. number of grandparents per 1000 grandchildren, calculated as a number of persons aged 65 and more per 1000 persons aged 0-14. In 2013 there were 993 grandparents per 1000 grandchildren, in urban areas 1103, and in rural areas 822. The above described changes in the age structure of population by biological groups will result in, until 2050, over a two-fold growth of this rate. In 2050 there will be 2382 grandparents per 1000 grandchildren.

Growth of the rate in question is anticipated in each powiat. The highest growth, over four-fold, will occur in Ostrołęka. Different level of ageing advancement will also lead to large diversity of this rate among powiats. In 2050 the interval between the most extreme values will amount to 2409 persons, and the range will be marked by wołomiński (1778) and lipski (4187) powiats.

Map 3. Median age of population by powiats in 2050



The process of society ageing is also reflected by the value of median age. In 2013 a statistical resident of Mazovia was 39.0 years old (median age means, that half of the population did not reach this age, and the other half exceeded it). Males were 37.3 years old on average, females – 40.7 years old. The median age defined in the projection for the year 2050 will be as high as 50.4 years, for males 47.8 years, and 53.0 for females. Population residing in urban areas will be slightly older, their median age will amount to 50.6 years, while rural area dwellers – 50.1 years.

Significant diversity is observed in the cross-section of powiats. In 2050 the interval between the extreme values of median age will amount to 12.6 years. The range of values is marked by wołomiński (45.8) and lipski (58.4) powiats. Among “the oldest” powiats, apart from lipski powiat, there are also: Radom (57.1), przysuski (56.3), Ostrołęka (56.1), gostyniński (56.1), Płock (56.0).

Demographically “the youngest powiats” include the above mentioned wołomiński powiat (45.8) as well as legionowski (46.8) and piaseczyński powiats (47.0).

A significant importance, from the labour market point of view, have changes anticipated in population of working age, as well as development of internal structure of this group, i.e. a ratio of persons at mobility age to those at non-mobility age. Up to 2013 a formal limit of working age was 59 for females and 64 for males, and all previous analyses of ratio of potential labour resources to population at pre- and post-working age were based on this classification (0-17, 18-59/64, 60+/65+) according to legal frames of going into retirement. Since January 1, 2013 according to the Act on change of law on retirement and other pensions from Social Insurance Fund and change of other laws (Journal of Laws 2012, item 637) which introduces a gradual increasing of retirement age up to 67 (Table 3.), in case of females the target age will be reached in 2040, and in case of males it will apply from 2020. Assuming an even distribution of births during a year, projection results by economic age groups has been calculated according to the new, presently binding rules.

Table 3. Retirement age binding since January 1, 2013

Year	Males	Females
2013	65,25	60,25
2014	65,5	60,5
2015	65,75	60,75
2020	67	62
2025	67	63,25
2030	67	64,5
2035	67	65,75
2040	67	67
2045	67	67
2050	67	67

When analysing the distribution of population by economic age groups it is anticipated that the percentage of persons at post-working age will be growing, and simultaneously the percentage of remaining groups will be falling. Number of persons at working age during the whole period of projection will decrease from 3337.2 thous. in 2013 to 2997.7 thous. in 2050, i.e. by 339.6 thous. Significant changes will also occur within the structure of working age, i.e. between mobility age (18-44 years) and non-mobility age (45 years up to retirement age limit). Persons from the first of the given groups are characterized by willingness to change their workplace, by territorial movements (migrations) and growing with age professional activity. Non-mobility group is more stable in terms of professional and territorial mobility, and their professional activity is decreasing as they approach the retirement age. According to projection results size of mobility group will decrease and size of non-mobility group will increase, which will result in ageing of work resources, and in consequence in deteriorating of workforce supply on the labour market.

Changes in population structure of working age will also influence changes in relation to other population age groups. Percentage of persons at working age in the structure of total voivodship's population will decrease by 6.4 p.p. by 2050, while persons at working mobility age by 11.2 p.p. At the same time the share of persons at working non-mobility age will go up from 22.9% in 2013 to 27.7% in 2050. It is projected that the share of persons at post-working age will reach 27.9% in 2050, i.e. it will rise by 9.2 p.p. compared with 2013 (18.7%). The youngest age groups, persons at pre-working age 0-17 in 2050 will represent 15.7% of total population – a 2.8 p.p. drop compared with 2013.

Table 4. Projected number of population (in thous.) by economic age groups.

Specification	2013	2020	2035	2050	2013=100
Pre-working 0-17	984,1	1005,9	869,5	834,7	84,8
Working mobility 18-44	2117,3	2000,9	1608,2	1522,6	71,9
Working non-mobility „shifting”^a	1219,9	1306,5	1758,4	1475,0	120,9
Post-working „shifting”	995,5	1075,0	1164,8	1486,4	149,3

a A term 'shifting' refers to retirement age changing by 2040, hence the interval limits of age groups in classification of non-mobility and post-working age are not constant

Amongst subregions the most favourable structure by economic age groups will note warszawski wschodni subregion. In 2050 it will record the highest share of persons at pre-working age (17.3%) and working age (57.1%), at the lowest share of persons at post-working age (25.7%). The lowest percentage of persons at pre-working age will occur in radomski subregion (13.6%). At the same time this subregion will record the highest percentage of persons at post-working age (31.0%).

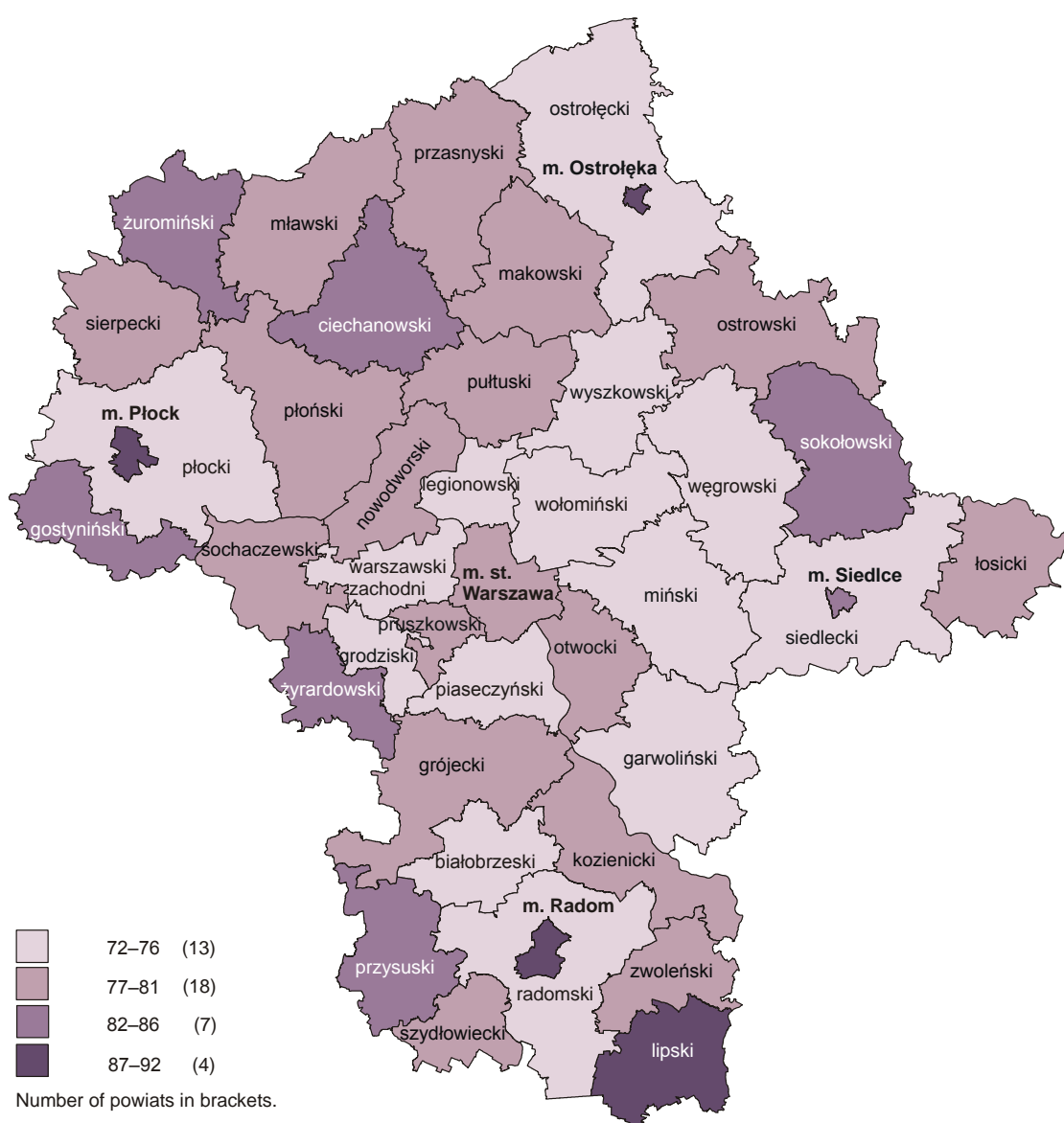
When analysing distribution of population by economic age groups in terms of powiats in 2050, it may be observed that the most favourable structure will have powiats adjoining Warsaw. Wołomiński powiat will note the highest, among Mazovia's powiats, percentage of persons at pre-working age (18.3%) and the lowest percentage of persons at post-working age (24.2%). The largest potential workforce resources in 2050 will be at the disposal of ostrołęcki and siedlecki powiats. Persons at working age will make up respectively: 58.3% and 58.0% of total powiat's inhabitants. The least favourable structure by economic age groups will note lipski powiat, where share of persons aged 0-17 (11.4%) will be the lowest, and share of persons at post-working age (35.1%) – the highest. Equally high – over 34% shares of persons at post-working age will be recorded in cities with powiat status: Radom, Ostrołęka and Płock.

Proportions between population at non-working to working age reflects age dependency ratio, which gives information on how many people at non-working age (pre-working and post-working jointly) there are per every 100 people at working age. Projection results show that the

proportions between respective groups will be deteriorating: the ratio in question will increase from 59 in 2013 to 77 in 2050. High value of this ratio leads to reduction in labour resources and generates costs of maintaining of non-working groups (among others increase in costs of healthcare services and social assistance for older people).

Among powiats the highest values of discussed ratio will note Ostrołęka, where there will be 92 persons of non-working age per every 100 persons of working age. Slightly fewer in cities with powiat status Płock and Radom (89 persons each). Relatively the most favourable values will record powiats: ostrołęcki and siedlecki (72 persons each) and legionowski (73 persons).

Map 4. Age dependency ratio by powiats in 2050



Population structure by sex, which is measured by femininity ratio (number of females per 100 males), will not change much during the period under projection. In 2050 there will be 107 females per 100 males (in 2013 – 109). In rural areas this rate will stabilize at the value of 100, which may indicate balance between sexes amongst rural dwellers. In urban areas the femininity ratio will amount to 112, there will be 2 females fewer per 100 males than in 2013.

Summary

According to the projection of the Central Statistical Office for the years 2014-2050, despite unfavourable changes in the population structure, the Mazowieckie voivodship against the background of other voivodships will remain a region with the greatest populating potential. Number of the voivodship's population in 2050 (compared with 2013 figures) will go up by nearly 2 thousand. Number of population will mostly increase in centrally located powiats adjoining Warsaw and in the capital itself. According to the projection results, adverse changes will occur in the age structure of population – ageing of population will be progressing. Population of post-working age is the only group which will rise in all investigated territorial units. The most advantageous age structure: low share of persons of post-working age and high share of persons of pre-working and working age will characterize powiats adjoining Warsaw. Adverse demographic processes: population loss and undesirable processes in its age structure will occur in powiats laying on the periphery of the voivodship.

Table 5. Population projection

Specification	2014	2020	2030	2040	2050
Ciechanowski subregion	344476	339168	327533	309590	287283
ciechanowski	90717	88922	84815	78666	71195
mławski	73857	72599	70066	66395	61806
płoński	88732	88036	86247	82960	78779
pułtuski	51392	51262	50524	48701	46181
żuromiński	39778	38349	35881	32868	29322
Ostrołęcki subregion	388896	383445	372049	354014	330366
makowski	46340	44922	42437	39237	35359
ostrołęcki	88239	88941	89871	89511	87747
ostrowski	74293	71992	68059	62980	56783
przasnyski	53350	52176	49960	46953	43091
wyszkowski	74009	74455	74475	73033	70654
Ostrołęka	52665	50959	47247	42300	36732
Radomski subregion	619512	607692	582569	546351	503199
białobrzegi	33606	33191	32279	30795	28779
kozienicki	61877	60483	57654	53454	48484
lipski	35268	33538	30739	27530	24021
przysuski	42710	41060	38252	34929	31172
radomski	151505	153723	155902	154877	151890
szydłowiecki	40300	39429	37736	35363	32423
zwoleński	36832	36028	34583	32511	29999
m. Radom	217414	210240	195424	176892	156431
Warszawa subregion	1728664	1748046	1755502	1752184	1768418
Warszawa	1728664	1748046	1755502	1752184	1768418
Warszawski wschodni subregion	806018	842701	890692	925155	955297
garwoliński	108630	108967	108897	106944	103643
legionowski	112592	120787	131877	140870	149434
miński	150873	156065	162792	167384	171466
nowodworski	78701	79558	79788	78338	75858
otwocki	123014	126436	130219	132289	133994
wołomiński	232208	250888	277119	299330	320902
Warszawski zachodni subregion	796181	830901	875296	905714	931311
grodziski	89745	95843	104319	111146	117541
grójecki	98821	99161	98512	96101	92912
piaseczyński	174343	189530	211233	229795	247043
pruszkowski	159426	165944	173999	179671	185267
sochaczewski	85184	85109	84044	81440	77913
warszawski zachodni	112199	118776	127591	134245	140253
żyrardowski	76463	76538	75598	73316	70382
Płocki subregion	333101	328476	316994	299401	278792
gostyniński	46333	45123	42645	39335	35632
płocki	111339	112805	114144	113315	111105
sierpecki	53133	51916	49570	46336	42466
Płock	122296	118632	110635	100415	89589
Siedlecki subregion	312855	307930	297692	282282	264077
łosicki	31914	30835	29000	26729	24212
siedlecki	81790	81857	81857	80694	78683
sokołowski	55412	53111	49310	44793	39757
węgrowski	67393	66131	63677	60085	55826
Siedlce	76346	75996	73848	69981	65599