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AGE COMPOSITION CHANGES OF RIGA AGGLOMERATION RING

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Abstract. *Over the course of several previous decades the post-socialist countries of Central and Eastern Europe have experienced notable population disposition and composition changes in the vicinity of large cities. Despite this, age composition related studies have rarely paid attention to changes within these city regions. Thus, the aim of this paper is to shed light on age composition changes of Riga agglomeration ring. For this study official statistical data, along with population ageing index is utilized. Changes are studied for the entire ring and its structures of urban and rural areas for the years 2000, 2011 and 2020. Results indicated that, despite a decrease, the 25-44 year old age group remained the most populous. 15-24 year old group had the largest decrease. Pre-working age and the two oldest groups were the ones which had tended to increase the most in comparison to situation in 2000. However, ring and urban areas first saw a decrease of pre-working age population leading up to 2011, followed by a more notable growth. Population ageing index values showed that for all territory types population ageing had slowed after 2011. Also, urban areas of Riga agglomeration have been ageing more rapidly than rural ones.*
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Keywords: *Age composition, Population ageing index, Population change, Riga agglomeration, Urban and rural areas.*

Introduction

Particularly rapid development of suburban forms of population in recent decades has been observed in the post-socialist countries of Central and Eastern Europe (Gentile, Tammaru, & van Kempen, 2012; Stanilov & Sykora, 2014). As a result, the surroundings of large cities are characterized not only by significant changes in population disposition, but also by changes in population composition. Surrounding areas of Riga have also seen similar changes and processes (Krisjane & Berzins, 2012).

Studies on agglomerations and other similar types of territories have paid limited attention to age composition and it has mostly been done within the comparison between different types of populations, based on such aspects as their previous migration experience or housing characteristics (e.g. Leetmaa & Tammaru, 2007). These studies have been conducted using survey data. Research

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based on statistical data has shed light mainly on countrywide characteristics (Walford & Kurek, 2008; Kerbler, 2015) and changes which have taken place in urban areas (e.g. Haase et al., 2010; Kurek & Wojtowicz, 2018). Consequently, characteristics of age composition in agglomerations remains an under researched topic.

Therefore, the aim of this paper is to shed light on age composition characteristic changes in the ring part of Riga agglomeration. Two research questions are put forward. What are the characteristics of age composition changes which have occurred in the ring of Riga agglomeration? What kind of differences can be observed between the territorial structures (urban and rural areas) of the ring?

To achieve the aim of this study and to answer the research questions, statistical data from the Central Statistical Bureau of Latvia (*Centrālā statistikas pārvalde (CSP*), along with population ageing index is utilized. Those few papers on this topic have all used relatively long timelines, comparing the situation at different years, spanning approximately a decade between each date. Hence, this study also uses similar type of a timeline. Changes and situation are studied for the entire ring and its structures of urban and rural areas for the years 2000, 2011 and 2020. This is the longest possible timeline and is fitting for the paper, since major residential development in the surrounding areas of Riga is considered to begin after the year 2000 (Krisjane & Berzins, 2012; Krisjane, Berzins, Ivlevs, & Bauls, 2012).

Literature Review

Age composition characteristics and its changes have gained importance since there has been a shift in population age structures from being relatively youthful to relatively old (Pool, 2007). Ageing is also considered as a persistent process in many territories of post-socialist states of Central and Eastern Europe (Kulcsar & Brown, 2017). Thus, many studies pay attention to population ageing, since this process has considered the most dominant demographic process taking place in Europe and other parts of the world in recent decades (Walford & Kurek, 2008; Stockdale, 2011).

While ageing has certainly been an important research object, numerous studies have looked at overall age composition changes. As mentioned in the introduction part, most studies conducted in the post-socialist countries of Central and Eastern Europe either focus on countrywide situation (Walford & Kurek, 2008; Kerbler, 2015) or on changes occurring in urban areas. The latter studies pay attention to aspects in gentrified inner-city areas or in urban areas which have experienced re-urbanization (e.g. Haase et al., 2010; Kurek & Wojtowicz, 2018).

Research done in Latvia also focuses on the countrywide situation on, for instance, dynamics of the three main age groups during various periods (e.g. Bērziņš, 2019). Some attention has also been paid to situation in Riga (Apsite-Berina, Paiders, Dahs, & Berzins, 2020).

Age composition related studies conducted in the region, have seldom looked at changes within these city regions, particularly the ring areas. Nonetheless, some research has been done with more of a focus on age composition and ageing. For instance, research on Lodz Functional Urban Region revealed that hinterland areas of the region were already experiencing population ageing during the 1988 to 2002, with the share of under 18 age group decreasing and shares of 45-64 and 65 and over groups increasing (Marcinczak, 2012)

More recently, a book on functional urban areas (FUA's) in Poland was published (Kurek, Wojtowicz, & Galka, 2019). A portion of this book is devoted to demographic trends, among which are age composition and population ageing. Since the fall of socialism (and up until 2016), share of pre-working age and mobile working age (ages 18-44) population has decreased, whilst older age groups (45-64 and 65 and older) have grown. That has been characteristic to most FUA's, with just a few ring areas seeing an increase. During the 1990-2016 period FUA's as a whole aged (core and ring) faster than territories outside of them and also surpassed the national average. Core parts accounted for majority of the increase. Nevertheless, for some types of FUA's (their rings) the index value increased by approximately 100%.

Methodology

This research is based on statistical data from the CSP. In particular, this research utilizes the experimental statistics data set on the number of permanent residents by sex and age on territorial units level, based on the boundaries in force at the beginning of 2020. This provided information on the number of people in eight age groups (from 0-6 to 65 and older) at the beginning of 2000, 2011 and 2020. These years was chosen based on the aforementioned aspects of historical development and that papers on this topic have all used relatively long timelines.

The number of age groups utilized was reduced to five. These included the pre-working age population of 0-14, three age groups of working age population (15-24, 25-44 and 45-64) and post-working age population (65 and older). The change in absolute numbers and in percentages are studied for these age groups. Apart from overall (for the entire ring) characteristics, this paper also investigates spatial differences. In this case, urban areas (their totals) are compared to rural areas. Characteristics of the ring are compared to the general situation of Polish FUA's, since that study (Kurek et al., 2019) utilized a different timeline.

Percentage values of age groups for the entire ring are compared to situation in Riga and all of Latvia.

Population ageing index is also utilized. This index is a ratio, which shows the number of post-working age population per 100 people of pre-working age population. Increase of the index value indicates that population is ageing (Preedy & Watson, 2010, p. 4140). This too is calculated for the ring as a whole and separately for urban and rural areas and the values compared to those for all of Latvia and Riga – core of the agglomeration. Again, characteristics of the ring are compared to the general situation of Polish FUA's.

Lastly, general population changes are also briefly looked at, once again for both the entire ring and its urban and rural areas.

Spatial extent used for this study consists of 32 territorial units making up the Riga agglomeration ring shown in Figure 1 (Skadins, Krumins, & Berzins, 2019). The town of Vangazi is included in order to have a more complete territorial coverage. Among these territorial units are 11 urban and 21 rural areas. 14 of the rural areas are parishes and the remaining seven are counties not further divided into parishes and urban areas.

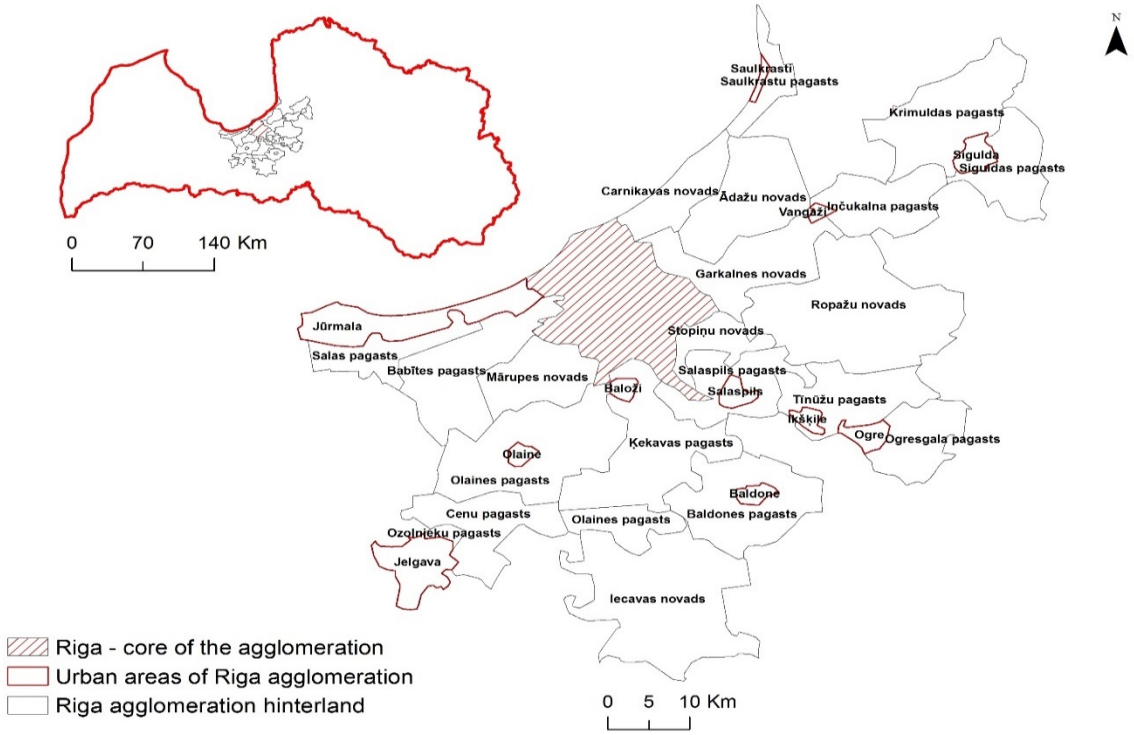

Figure 1 ***Territorial Units of Riga Agglomeration and the Location of Agglomeration in Latvia*** (*author's elaboration based on Skadins et al. 2019*)

Whilst this extent of Riga agglomeration accounts for only approximately 5% (3226.5 km^2) of the territory of Latvia, its population of 342 434 (beginning

of 2020) made up nearly one fifth of the total population (Centrālā statistikas pārvalde (CSP), 2020).

Research Results

The total population of Riga agglomeration ring saw an increase during both time periods (Table 1). Over the course of 20 years it had grown by 9.8%, with the bulk of growth occurring from 2000 to 2011 (increase of 6.5%). While the total population had grown during both time periods, the situation with age groups was much less uniform.

Only two of the oldest groups had grown during both periods, whilst for other groups the change was either not uniform or constantly negative. 15-24 year old group had the sharpest decrease, with its absolute numbers shrinking by nearly half. As a result, in 2020 this group was the smallest one.

Table 1 ***Absolute Numbers and Share of Riga Agglomeration Ring Age Groups***

Year	2000		2011		2020	
Age group	Absolute	%	Absolute	%	Absolute	%
0-14	56 253	18	53 697	16.2	66 043	19.3
15-24	46 771	15	41 451	12.5	29 424	8.6
25-44	90 374	29	99 563	30	97 363	28.4
45-64	77 949	25	84 070	25.3	89 454	26
>65	40 483	13	53 346	16	60 150	17.6
Total	311 830	100	332 127	100	342 434	100

Source: author's elaboration based on CSP, 2020 data.

25-44 year old group first saw an increase by approximately 10% (of absolute numbers), followed by a 2.2% decrease. Despite these changes, it maintained its status quo as the largest group. The two oldest groups had the highest increases, with the absolute numbers of 65 and over group increasing by nearly 50%. 0-14 year old group first experienced a slight decrease (by 4.5%) and then had a more notable increase by 23%. This group, along 15-24 year old group, were the only ones which saw a more voluminous change from 2011 to 2020.

This indicates a rather interesting situation of increases in share for both the youngest and the oldest age group. During the 2011-2018 period similar situation was characteristic to all of Latvia (Bērziņš, 2019). The changes were partly similar to the situation of FUA's in Poland. The difference here was the changes for the pre-working age group, which in most cases was on the decline (during the 1990 to 2016 period) for the FUA's in Poland (Kurek et al., 2019).

As for share of each group, their changes were rather subtle, apart from the 15-24 year old group, the share of which shrunk by nearly half, and, to a certain extent, the post-working age group whose share went up by nearly 5%. This led to youngest working age group having the smallest share, being surpassed by the post-working age group. Remaining three groups maintained the same order throughout the entire timeline.

Table 2 shows the shares of age groups in Riga and all of Latvia. There have been distinct differences between the ring of agglomeration and these two territories. This was particularly evident for the youngest and oldest age groups. While the nature of change was similar (first a decrease, then an increase), ring maintained a higher share of pre-working population and a lower share of post-working population. Situation with 25-44 and 45-64 year old groups was just slightly less uniform. Characteristics of change were somewhat similar for 45-64 year old group, as the share tended increase (except for Riga, which in 2020 had a lower share than in 2011). Share of 25-44 year old group experienced an increase followed by a decrease for both the core and the ring, whereas for all of Latvia it had only decreased. In the case of youngest working group (15 to 24), differences in share were the least uniform (in half of the instances the ring had a higher share, in the other half it had a lower share) and the nature of change differed as for Riga and rest of Latvia the share slightly increased from 2011 to 2020.

Table 2 ***Age Group Percentages in Riga and All of Latvia and Their Comparison to the Ring***

Year	2000		2011		2020	
Age group	Riga	Latvia	Riga	Latvia	Riga	Latvia
0-14	15.2↓	18.1↑	13↓	14.2↓	15.6↓	16↓
15-24	14.1↑	14.2↓	6↓	7.1↓	8.4↓	9.1↑
25-44	28.3↓	28.4↓	29.3↓	27.4↓	29↑	26.6↓
45-64	26↑	25=	27.1↑	26.8↑	26.3↑	27.8↑
65 and older	14.8↑	15.6↑	18.6↑	18.4↑	20.7↑	20.5↑
↓ / ↑ / = - share compared to value of the ring; lower, higher, equal						

Source: author's elaboration based on CSP, 2020 data.

Population ageing index values fluctuated, though for the last two years they were noticeably higher (99.3 in 2011 and 91.1 in 2020) than in 2000, when there were 72 post-working age people per 100 people aged 14 and under. In comparison, index values for all of Latvia experienced similar changes, i.e., an increase leading up to 2011, followed by a more pronounced growth of the youngest age group, in turn decreasing the index values. Apart from that there were no similarities. In 2000 there 81.8 post-working age per 100 people aged 14

and under, which had increased to 129.3 in 2011 and just slightly decreased to 128.3 in 2020.

Whilst index values for all of Latvia were considerably higher than for the ring of agglomeration, they were lower than those for the core city of Riga. Already in the year 2000 there were over a 100 (102.8 to be precise) post-working age people per 100 people of pre-working age. By 2011 the index value had risen to 143.2, before a decline to 132.9 in 2020. These kind of increasing notable differences between core and ring have also been prevalent in all types of FUA's in Poland (Kurek et al., 2019).

Urban areas accounted for the majority of population in all three years (Table 3). Nevertheless, the number of people living in them had decreased by 8.1%, whereas the population of non-urban areas had grown rapidly, increasing by 47% during the first two decades of the 21st century. Most of this increase (by 30.7%), however, took place up until 2011. Most age groups had undergone similar changes. Population of age groups in rural areas tended to grow over time, with a more notable growth until 2011, whereas this kind of change was much less characteristic for urban areas. However, their changes too were, for the most part, more notable during the 2000 to 2011 period.

Table 3 ***Riga Agglomeration Ring Age Groups in Its Urban and Rural Territories***

Year	2000		2011		2020	
Age group	Urban	Rural	Urban	Rural	Urban	Rural
0-14	36 481	19 772	30 286	23 411	34 182	31 861
15-24	31 661	15 110	24 728	16 723	16 452	12 972
25-44	61 009	29 365	58 475	41 088	53 343	44 020
45-64	53 448	24 501	51 799	32 271	51 275	38 179
65 and older	27 846	12 637	34 259	19 087	38 141	22 009
Total	210 445	101 385	199 547	132 580	193 393	149 041

Source: author's elaboration based on CSP, 2020 data.

Similar to the situation of the entire ring, the 25-44 year old group maintained the highest absolute number and share. This remained unchanged for both territory types. Though for urban areas its numbers decreased by 12.6%, whilst rural areas grew considerably (by 61.1%; with most of the growth taking place before 2011). Contrary to the overall situation, the numbers of pre-working age group in rural areas increased both in comparison to 2000 and 2011.

These disparities between urban and rural areas could be attributed to the fact that suburbanization has been more pronounced in rural areas, in particular for rural areas surrounding the core city of Riga. Previous research has shown that suburbanization usually results in an influx of people from this age group (see e.g.

Ourednicek 2007) and often suburbanites are families with pre-school age children (see e.g. Krisjane & Berzins 2012).

The oldest working age group (45 to 64) had varying trajectories of change, with a 3.5% decrease in urban areas and a 56% increase in rural areas. Once again, biggest change took place leading up to 2011. Post-working age group grew in both areas, with urban areas experiencing a slightly more pronounced increase. In rural areas the number of people aged 15 to 24 actually increased by 10.7%, up until 2011. That was an exception for this group, since in every other case this group had decreased, with urban areas shrinking by nearly half. Interestingly, a more notable shrinkage took place during the 2011 to 2020, the lone such instance for urban areas.

Changes in population ageing index values were also rather notable. In 2000, urban areas did have a higher index value than rural areas; however, the gap was not as wide (76.3 to 63.9) as for the other two years chosen for this study. By 2011, the values for both types of territorial structures had increased considerably. In rural areas for every 100 pre-working age people there were 81.5 post-working age people, an increase by 27.5%. Still, it was not as voluminous as for urban areas which, by that point, had 113.1 people aged 65 and older per 100 pre-working age people. In the case of urban areas, the index value had gone up by 48.2%. Lastly, during the period leading up to 2020, the ageing had slowed down, due to bigger increase of the youngest age group. Once again rural areas had displayed a more positive trend. Urban areas had seen a slight decrease by 2.3%, down to 111.6, whereas for the rural ones the decrease was by 15.2%. Hence, the index value approached that of the year 2000 (down to 69.1).

It is also important to look at the share of each group and how those have changed over time. They are shown in Figure 2.

While the number of people belonging to each group changed considerably, the characteristics of shares changed much less notably. Nevertheless, some changes in absolute numbers also impacted shares. 15-24 year old group share decreased similarly for both areas, thus becoming the group with the smallest share. Similarly, to the changes for the entire ring, post-working age group constantly grew, surpassing the youngest working age group. Meanwhile, remaining three groups maintained the same order throughout the entire timeline. However, as in the case of absolute numbers their change was not uniform, with 25-44 year old group tending to decrease and the other two groups tending to increase.

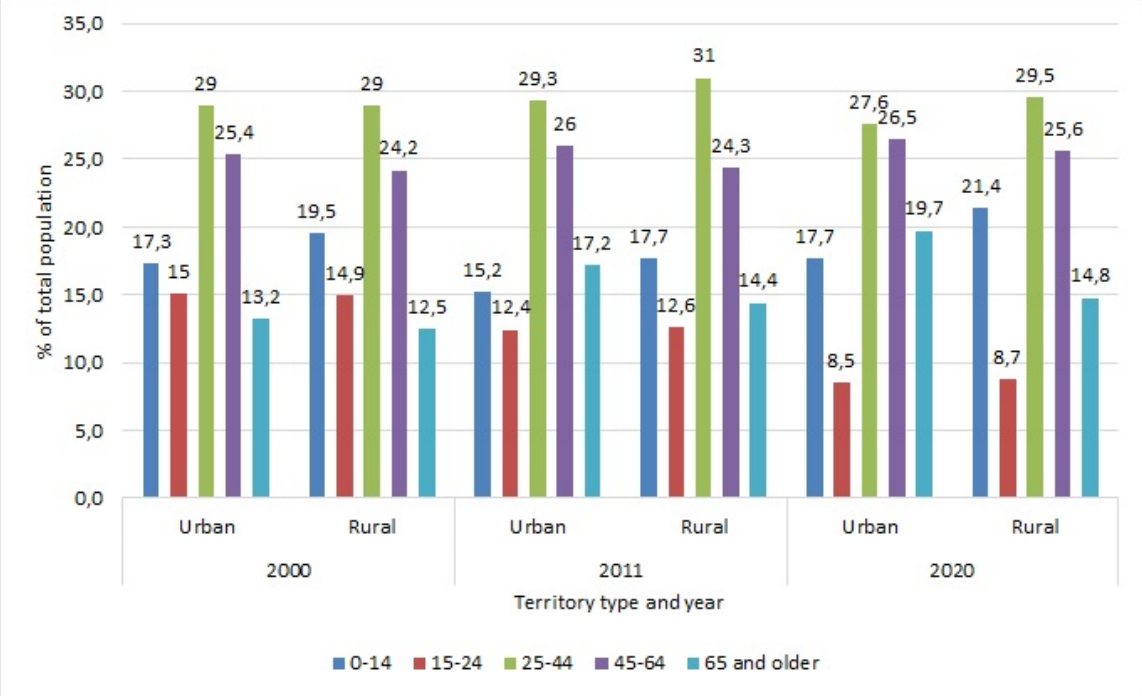

Figure 2 ***Share of Age Group Population among the Total Population for Urban and Rural Areas*** *(author's elaboration, based on CSP, 2020)*

Conclusions

This paper focused on the age composition changes of Riga agglomeration ring. Changes were studied for the entire ring and its structures of urban and rural areas for the years 2000, 2011 and 2020. This was done by utilizing data on the number of permanent residents by sex and age on territorial units level. Lack of papers on this topic and their specific timelines limited interpretation and comparison of characteristics. Thus, characteristics of the ring were compared only to the general situation of Polish FUA's, as well as to situation in Riga and all of Latvia.

25-44 year old group maintained the highest absolute number and share for both the entire core and its structures. 15-24 year old group in turn had the largest decrease, leading to it becoming the smallest group. Pre-working age and the two oldest groups were the ones which had tended to increase the most in comparison to situation in 2000. However, ring and urban areas first saw a decrease of pre-working age population leading up to 2011, followed by a more notable growth. Characteristics of change for several groups were rather similar to characteristics for all of Latvia and for Riga, as well as for all types of FUA's in Poland.

For all territory types population ageing had slowed after 2011 as shown by population ageing index values. Population of the ring had aged less rapidly than for all of Latvia and for Riga. Similar differences between core and ring have also

been prevalent in all types of FUA's in Poland. In Riga agglomeration urban areas had experienced more significant ageing than rural areas, as highlighted by the considerable widening of gap in ageing index values.

Overall, these results are important since they not only filled a research gap and could be valuable for planning and policy making related decisions. In particular, they could be used for research-based decision making regarding the development of Riga Metropolitan Area.

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