AGEING MAP OF THE BALKAN PENINSULA

Ivana Magdalenić*, Marko Galjak*[1]
* Faculty of Geography, University of Belgrade

Abstract: Age structure of a population, representing the final result of all the demographic processes, tells a unique story which incorporates not only the main demographic components, but also its history, cultural and political characteristics of the population. Through its history the Balkan Peninsula has been alluring to all kinds of demographic research. The process of aging, which is intensifying in all developed countries, will increasingly be the main focus of future demographic research. Although there is undeniable general shift in the age structure, there are many regional differences in the Balkan Peninsula. Thus, for the purpose of this paper we created a choropleth map of the Balkans showing the age structure at NUTS 3 regional level. For the purposes of this paper borders of the Balkan Peninsula are defined by Jovan Cvijić in his homonymous work. Toward a more complete understanding of the ageing phenomena in the Balkans we conducted an analysis of regionalization of ageing, to serve as a backbone for the analysis of age structure at the national level. We compare ageing borders with ethnic, religious and political borders in the peninsula.

Key words: ageing, map, regions, the Balkans

Introduction

The last decades of the 20th century in the world were marked by divergent demographic processes, which have had many implications for some of the most important segments of society. These processes are reflected through higher birth rates in Latin America, Asia and Africa as well as lower than required birth rates in Europe, North America and Australia. The main trend of fertility rates in Europe after the 1960's was in a continual decrease, at first reaching the replacement level, and then continuing to fall below 2.1. The sudden fall of fertility rates was first detected in Western and Northern Europe between 1965 and 1975, later in Eastern Europe during the 1990's (Avdeev, et al., 2011). These changes in reproductive behavior on the Old continent with positive changes in mortality patterns, i.e. reduction of specific mortality rates and the increase of life expectancy, have brought about major changes in the age structure of the population.

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[1] Correspondence to: galjak@gmail.com

The population ageing phenomenon undoubtedly represents present reality, and has been a subject of interest to the mainstream media in the last decades (Rašević, 2002), which is to be expected since it is an inevitable and omnipresent concern for both developed and developing countries, with a threat of becoming a permanent characteristic of human society. One of the main challenges that humanity faces is providing solutions for undesirable intensive processes (like low birth rates and resulting population ageing), as well as finding ways to ameliorate their effects. The time needed for these processes to form and develop varies. At first it was manifested in the most developed countries of the Old Continent, however rapid changes in the less developed parts of Europe have caused more intensive changes there.

Heterogeneity of the Balkans, manifested by different cultural, religious and ethnic characteristics of its population, affected by many socioeconomic and political processes, has from long ago made this specific region interesting to researchers. The main goal of this paper is to indicate the level and intensity of population ageing, by studying fundamental characteristics of population structure on the Balkan Peninsula. That way the insight to the current demographic problems will be provided, and the differences, regarding population ageing, between the observed countries will be identified.

Methods and Data

The subject of this research is total population of the countries located in the Balkan Peninsula. The countries included in this research are: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Greece, Macedonia, Montenegro, Romania, Serbia, Slovenia and the European part of Turkey[2]. Italy which, according to accepted borders of the Balkan Peninsula, has two regions on the peninsula (Trieste and partly Gorizia) is not included in the analysis.

Time frame of the analysis is the beginning of the 21st century. The age structure of the Balkans for the previous period has been studied extensively, focus of this research is period after year 2001 i.e. age structure changes in the contemporary period.

Measures used in the analysis are: percentage of younger than 15 in the population, percentage of older than 65 in the population and ageing index. For purposes of this paper ageing index was calculated using the following formula:

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[2] Only European part of Turkey i.e. East Thrace is included in the analysis, for further explanation see the Methodology and Data section.

$$i_s = \frac{P_{65+}}{P_{0-14}} \qquad\qquad (1)$$

The alternative way of calculating ageing index is the proportion of older than 60, and younger than 20 years. The former formula was selected due to two reasons; first it is used more widely in recent years, second some sources of data only provide age structure in broad age groups (0–14, 15–64, 65+), and not in five year groups.

For purpose of making Choropleth map of ageing index for the Balkan Peninsula, borders are defined by Jovan Cvijić in his homonymous work: sea makes the clear border from East, South, and West, the North border of the peninsula is: the Sava and Danube, the border is extended from confluence of the Kupa following the valley of the Sava and Ljubljana Basin to the connection with the mountains with the Alps. The West border is clearly marked by Soča. (Cvijić, 1922)

Territorial units on the choropleth are NUTS 3 regions, i.e. analogous administrative units for countries that still have not had adopted "The Nomenclature of Territorial Units for Statistics" (NTUS, French NUTS) of the European Union. NUTS 3 regions have population between 150 and 800 thousand. The population criterion is not always respected with regard to many regions in the EU itself. Analogous regions often do not fulfill the same criteria. In this paper the word "region" is used to represent all the administrative units represented on the choropleth, even though in different countries the word has a different meaning.

Data sources on regional level for countries on the Balkan Peninsula vary depending on the availability:

Albania — 2011 census data at the level of 12 districts. (INSTAT, 2012)

Bosnia and Herzegovina — Data for the 10 cantons of Federation of Bosnia and Herzegovina were obtained from estimates made by Federal Institute for Statistics (Institute Office of Statistcs Federation of Bosnia nad Herzegovina, 2011). The estimates do not exist for the Republic of Srpska and Brčko district. Data from the census of 2013 have not yet been published at the time of writing this paper.

Macedonia — The age structure estimate is given by the State Statistical Office, for statistical regions which are not in use anymore (State Statistical Office

Republic of Macedonia, 2012). Although this administrative division is not official any more, it is used in the choropleth to show the differentiation at subnational level in Macedonia.

Montenegro — 2011 Census (Statistical Office of Montenegro — MONSTAT, 2011). Montenegro is shown on the choropleth as a single entity which, given its small population makes sense. Official administrative division divides Montenegro in 21 municipalities, there is no level between the national and municipal, i.e. municipalities are the largest subnational administrative units.

Serbia — 2011 Census (Statistical Office of the Republic of Serbia, 2012). Data is given for 25 districts. Reliable data for Autonomous Province of Kosovo and Metohija are not available. Thus AP of Kosovo and Metohija is not included in the analysis.

Turkey — Data are obtained from Turkish address based population registry database (Turkish Statistical Institute (TurkStat), 2015). Only data for the European part of Turkey are taken into account, i.e. only regions that are on the Balkan Peninsula are shown on the choropleth. For two regions that have parts of their territory on both the Balkan and the Anatolian Peninsula (Istanbul and Canakkale), only districts that are on the European side have been taken into account to calculate ageing index for these two regions. The choropleth completely excludes Anatolia.

Bulgaria, Greece[3], Croatia, Slovenia and Romania are members of the EU and data for them are based on the 2011 national censuses, as a source for the data Eurostat database was used (Eurostat, 2015). Data for these countries are naturally provided at NUTS 3 level.

Beside data at regional level, data on national level were also used. These data come from Eurostat (Eurostat, 2015) and US Census Bureau (US Census Bureau, 2015). For the Figure 3, additional data on percentage of Muslim population by country are used. These data are based on surveys done by Pew Research Center (2011).

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[3] In case of Greece the old administrative division is used which was in effect before the reforms of 2011.

Results

As the process of population aging is nothing more, but a change in configuration of the age structure of population, we immediately turn to analysis of the age structure.

Inspecting the percentage of certain age groups in population can give us an insight not only into progression of the process of aging but it also gives us a way to more effectively compare populations of different countries. As already stated, the focus of this research is the beginning of the 21st century (2001–2015), but it needs to be said that current demographic processes are inseparably tied to those demographic processes that shaped the current population structure in the past, especially those in the last decades of the 20th century[4] (Kotzamanis, 2001; Penev, 2010).

At the very beginning of the 21st century the percentage of people aged 0–14 was considerably higher than it is today, for all the observed countries (Table 1). Among the countries difference in this percentage is evident, the lowest was for Greece (14.8%), and the highest in Albania (30.7%). Also it is evident that with Albania, Turkey (30.5%) is also ahead of the other countries with higher percentage of population younger than 15.

The explanation for these tendencies is obvious: higher fertility rates imply a larger percentage of young population. According to many papers on this subject, these countries have had higher fertility rates in the last half of the 20th century (Kotzamanis, 2001; Penev, 2010). Other papers proclaimed the Balkans as the most demographically heterogenic area of Europe (Penev, 2010). On one hand there were these 2 countries which had fertility rates above 3 children per woman. On the other hand there were the rest of the Balkan countries that had fertility rates insufficient for generation replacement.

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[4] The last decade of the 20th century is marked by turbulent economical, political and societal changes (Penev, 2010)

Table 1. Percentage of young (0–14 years old) and old (65+) in total population of the Balkan Countries for 2001, 2011 and 2015

	2001		2011		2015	
	0–14	65+	0–14	65+	0–14	65+
Albania	30.7%	7.3%	21.4%	10.5%	18.8%	11.3%
Turkey	30.5%	5.5%	26.7%	6.5%	25.4%	7.1%
Macedonia	22.3%	10.1%	18.4%	11.6%	17.5%	12.7%
Montenegro	21.2%	12.3%	15.5%	13.5%	15.2%	14.4%
Bosnia and Herzegovina	19.2%	10.4%	14.8%	12.5%	13.5%	13.7%
Romania	17.8%	13.6%	14.8%	14.8%	14.5%	15.7%
Croatia	17.3%	15.5%	15.1%	16.8%	14.4%	18.2%
Serbia	16.5%	16.3%	15.1%	16.5%	14.7%	17.6%
Slovenia	15.4%	14.3%	13.4%	16.7%	13.4%	18.4%
Bulgaria	15.3%	16.6%	14.1%	17.5%	14.5%	18.7%
Greece	14.8%	17.8%	14.2%	19.6%	14%	20.4%

In the course of the following decade (2001–2011) the percentage of young population was falling. Differences in the tempo of this change are notable, and in that context Albania needs to be mentioned as it marked the biggest fall of 9.3 percentage points. A big emigration wave noted in Albania after 1990 (Kotzamanis, 2001), reflected on lower fertility rates[5], which on the other hand reflected on lowered percentage of young people in the population. Another notable example of lowered percentage of young people in the same period is Montenegro (5.7), while other countries marked considerably less change. The last four years certainly represent a small time frame for any big changes in age structure to occur, however changes are notable. Only Bulgaria has not had smaller percentage of younger than 15. Turkey (25.4%) is on top of the list in 2015 as well, with higher percentage of younger than 15, which is uncharacteristic for the rest of the Balkans and Europe for that matter. Maintaining such a large proportion of younger than 15 in a population, can to a certain degree be attributed to higher fertility rates[6] which are still relatively high. Bosnia and Herzegovina, Romania, Croatia, Serbia, Slovenia and most distinctly Greece (13.4%) and Bulgaria (13.5%) have very small percentage of younger than 15 in the total population.

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[5]Albania went from a country with very high birth rates, to a country with insufficient fertility for generation replacement (Vojković, Magdalenić, & Živanović, 2014; Magdalenić, 2013)
[6] Total fertility rate in Turkey has fallen from 2.48 children per woman in 2001 to 2.05 in 2015 (US Census Bureau, 2015)

The effect of mortality on population ageing can be twofold. First, bringing down infant mortality and mortality of young children boosted the numbers of the youngest cohorts and that way slowed the aging process. Second, after the 1960's and 70's those positive tendencies in mortality contributed to population ageing.

Analysis of percentage of old people (more 65 years old) in population at the beginning of the 21st century and now (2015) leaves us with a couple of conclusions. First there are major differences among countries with lowest percentage in Turkey (5.5%) and highest in Greece (17.8). In 2015 Greece (20.4%) is still on the top list, while Turkey (7.1%) has the lowest percentage of old people. Another conclusion is that this process of growing percentage of older people was unfolding more slowly than the shrinkage of the youngest cohorts. If we consider the intensity of change of the old cohorts in this period (2001–2015) the percentage of young people fell most notably in Albania (11.9 percentage points), while increase of the percentage of older was most notable in Slovenia with 4.1 percentage points. The increase of the percentage of old people is mostly affected by mortality conditions. Except for Greece and Slovenia the research has shown that the Balkan countries have short life expectancy on the European ranking list (Penev, 2010), which implies that there is a lot of space for improvement in mortality of old population.

Detailed overview of 2011 data

For a detailed analysis of age structure it is not enough to merely contemplate one measure, even if it is shown in a time series. It is necessary to analyze the cross-section of the entire age structure in one year. Irreplaceable graphical instrument for analysis of age structure is a population pyramid. Therefore we constructed two graphical representations: Figure 1 and Figure 2. Population pyramids of countries that have ageing index higher than 1 are displayed in the Figure 1. Those are the countries which have a larger number of older (65+) than younger people (bellow 15). In this group Greece has the highest ageing index, and Romania the smallest. All the countries in this group have similar age structure. The youngest five age groups represent about 4 percent of the total population (2% for each sex). Accordingly, since there are no major differences in fertility and the size of the youngest population, the main factor that differentiates is the size of the older population. The size of the old population depends on the size of the cohort and the mortality conditions. As it was already observed, Greece and Slovenia are countries with the most favorable mortality conditions in this group (Galjak, 2014)
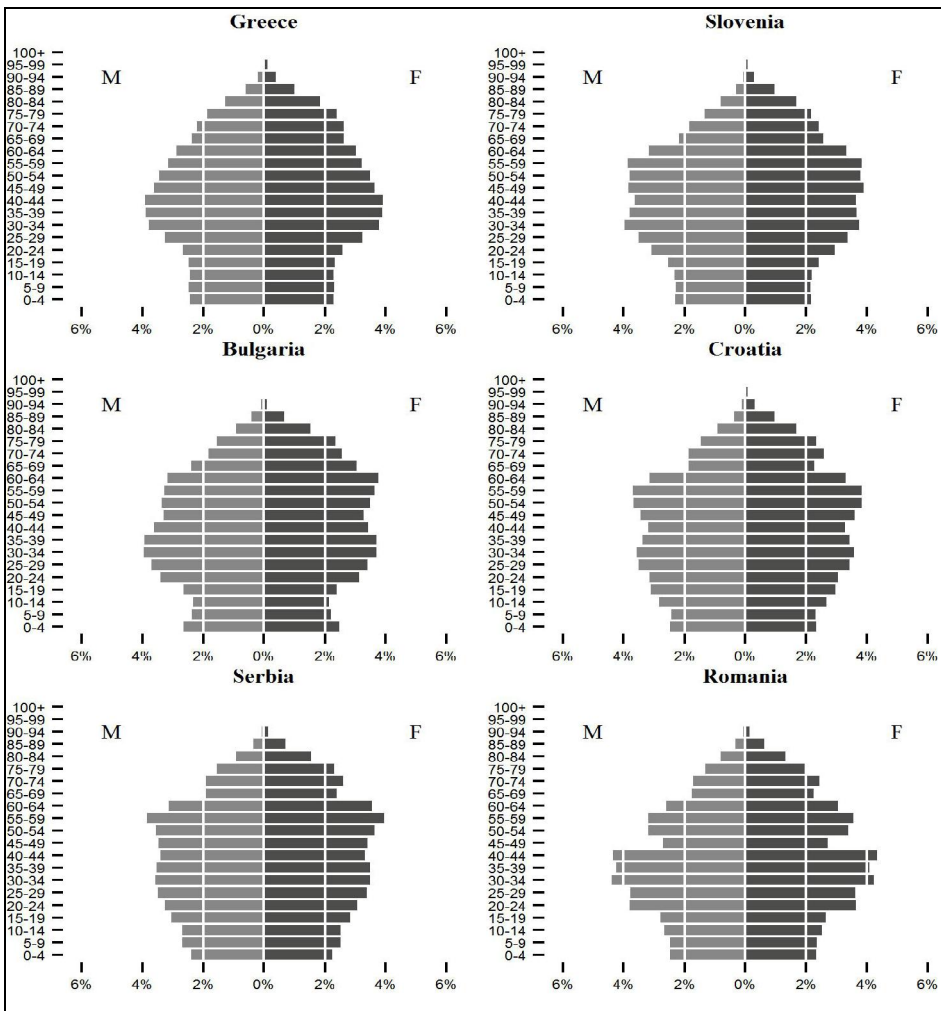
Figure 1. Population pyramids of the Balkan countries that have ageing index higher than 1 for 2011

Another common characteristic of these populations, shown in the Figure 1, is the location of the "baby boom" generations in the pyramids. Namely in these countries the "baby boom" generations are at the threshold of becoming older than 65 years[7], which means that their age structure in the future will be even worse. This trend is easily noticeable in the Table 1, when comparison of the

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[7] The exceptions are Greece and partially Bulgaria, countires which have not had a large "baby boom" (Van Bavel & Reher, 2013), which is evident in their population pyramids.

increase in the 65+ population for 2011 and 2015 is made. For only four years in case of Serbia the percentage increased more than in the previous ten year period between 2001 and 2011.

Except the common characteristics, each pyramid contains unique anomalies which reflect different historical events. Some of the events clearly visible on the pyramids are: World War 2, abortion ban in Romania, The Fall of Berlin Wall and the 90's crisis, etc.
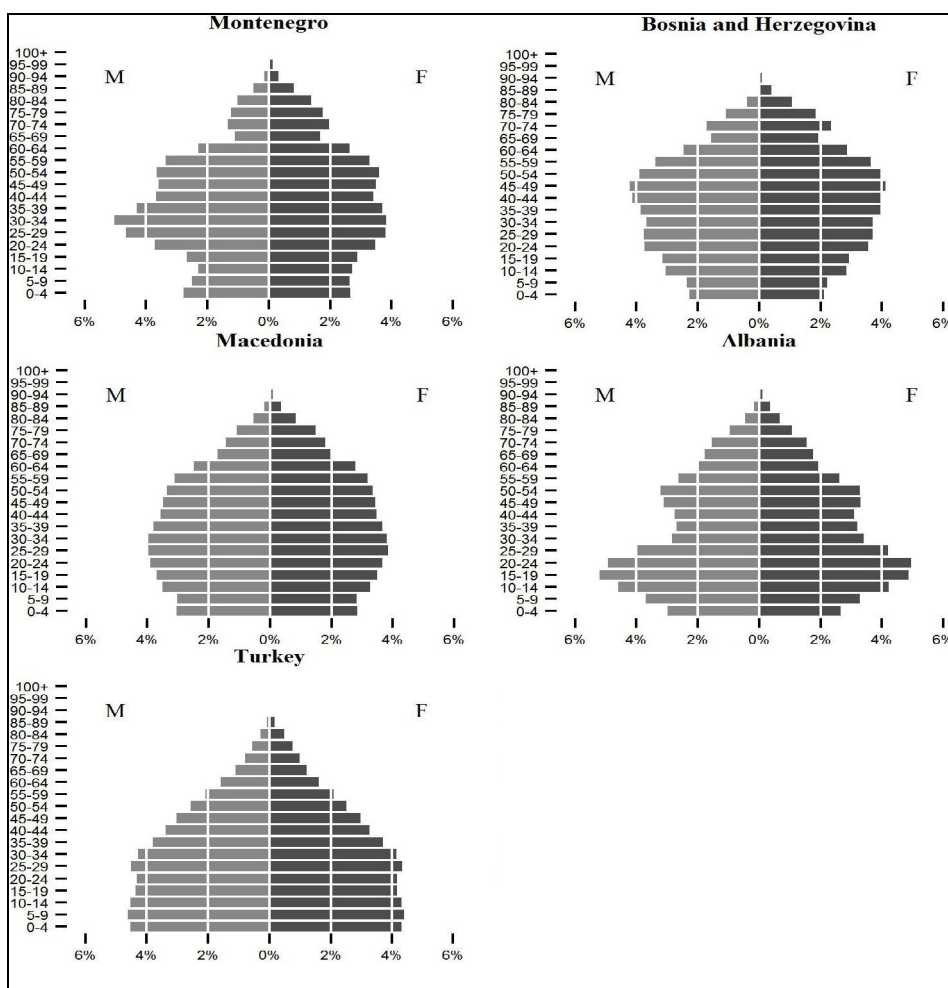

Figure 2. Population pyramids of the Balkan countries that have ageing index lower than 1 for 2011

The Figure 2 depicts population pyramids of the countries that have ratio of old and young higher than 1. Albania and Turkey stand out most in this group, with the age structure being different from the rest. The transition of fertility in Albania that was already mentioned made the pyramid narrow towards the base, for the last 3 five-year groups. In case of Turkey, that narrowing cannot be clearly seen in 2011, however we can state with great certainty that the narrowing will occur in the future, considering already mentioned falling fertility rates.
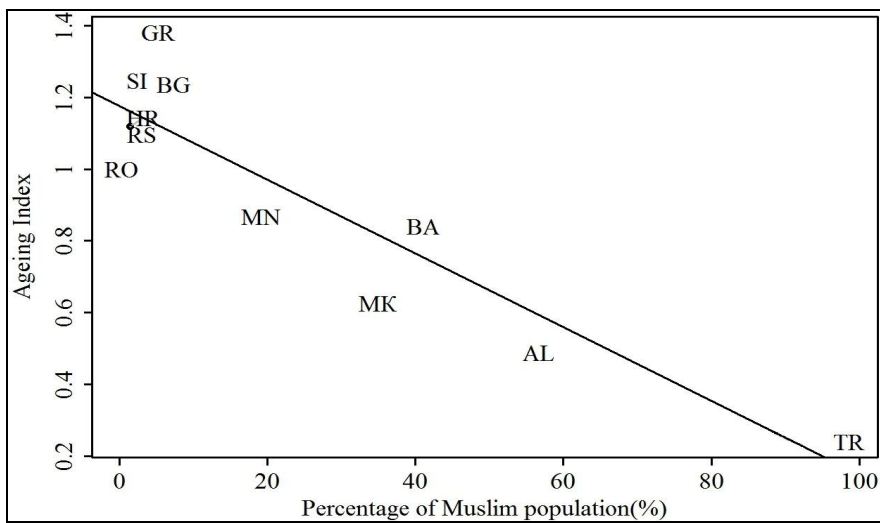

Figure 3. Relationship between ageing index and percentage of Muslims in the populations

All countries in this group have a significant percentage of Muslim population. Higher fertility rates, characteristic for Muslim populations (Mehtab, 1997), led to a desirable age structure. It is impossible to claim causation between religious affiliation and fertility rates, but based on the evident correlation (Figure 3), we can conclude that it may have been one of many cultural and historic factors that shaped the current age structure. Namely the higher percentage of Muslims in a population does not guarantee younger population, which can be seen in the Figure 3 if you compare Montenegro and Bosnia and Herzegovina, Romania and Greece, etc. Therefore even if religion is a factor, it cannot be claimed that it is a determinant factor.

Regional map of aging

After the short review of ageing process at the beginning of the 21st century and the cross-section analysis in 2011, we need to turn to regional view of the ageing

in The Balkan countries. For that purpose we constructed a choropleth that shows ageing index for NUTS 3 regions of the Balkans (Figure 4).

When we change focus of the age structure to regional level, the effects migrations have on the age structure become more visible. In all of the Balkan countries the ageing is more prominent in rural areas, while big city centers have a much more desirable age structure. This phenomenon is the most obvious in Serbia, where the Eastern Serbia two regions have ageing index higher than 1.8 and these are Zaječarska (2.1) and Pirotska regions (1.87). On the other side, there are regions like Novi Sad (0.99) and Belgrade (1.12), which represent the centers of internal migration of Serbia, and therefore have younger populations[8]. In case of Romania, which has very intensive emigration, but lacking intensive internal migration towards big cities[9], ageing across region is more homogenous. In case of Croatia, Greece and partly Bulgaria and the European part of Turkey differentiation of regions by level of development is also seen. Northern Croatia and Zagreb, Athens, Thessaloniki, Bulgarian coast and Istanbul have younger populations than other regions of their respective countries. In Albania the situation is reversed, the least developed regions have the youngest population (Kukes 0.29). The youngest region in the Balkan Peninsula is the biggest city in the peninsula: Istanbul (0.21), which has the advantage of population with higher fertility rates as well as very strong immigration. The oldest region in the Balkans is Greek region Evrytania (2.84)[10].

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[8] A more detailed choropleth of ageing index at the level of municipality can be seen in (Penev, 2014)

[9] The Populations of Bucharest, Cluj and Timisoara (three most populous cities in Romania), have shrunk between the last two censuses (United Nations, 2015).

[10] In case of Greece many regions do not fulfill the population criteria of NUTS. Some NUTS 3 regions in Greece have fewer than 40,000 people. Such small populations are prone to aberrations in age structure, which is important to point out if you are comparing Greek regions with the rest of the Balkans' regions. Two regions with bigger populations and undesirable age structure are Serres (2.15) and Kilkis (1.84). These two regions in Central Macedonia (Greece) as well as two clusters of smaller regions on Peloponnese and Thessaly are parts of Greece with the oldest population.
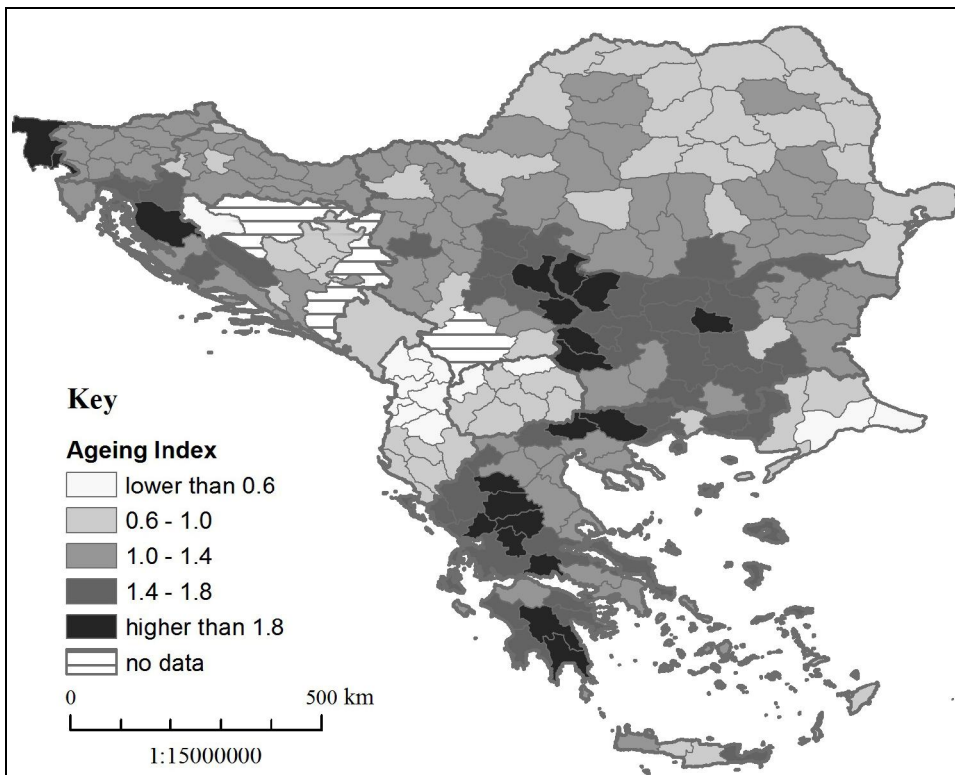
Figure 4. Choropleth of ageing index for NUTS 3 regions on the Balkan Peninsula in 2011, and ageing index at national level for 2001, 2011 and 2021

On the choropleth the regionalization of ageing in the Balkans is evident in two cases. The one already mentioned is clustering of smaller regions on Peloponnese and Thessaly. The other is the case of Eastern Serbia and Western Bulgaria. Already mentioned regions of Serbia: Zaječarska and Pirotska regions, together with Bulgarian regions: Vidin, Montana, Pernik and Kyustendil form one big old region in the heart of the Balkan Peninsula, coincidently these regions are on the slopes of mount Balkan, which parts in Serbia are officially called "Stara planina", meaning Old Mountain. Along the same meridian south of these regions are the Greek old regions Serres and Kilkis.

The difference in age structure between the populations of different religions can also be seen in the Figure 4. These differences are most clearly seen in Serbia's Pčinjska and Raška regions, Macedonian region Polog which have younger populations than their respective countries, and South Albania together with

Shkoder[11], which have older population than the rest of Albania. The lack of data for the Republic of Srpska leaves us unable to make a similar comparison for Bosnia and Herzegovina, however, if we were only to analyze the Federation of Bosnia and Herzegovina, we come to the same conclusion: regions with Bosniak majority are younger, the clearest example is Una-Sana Canton (0.55), with the Bosniak majority and neighboring Canton 10, i.e. Livno Canton (1.6) where the Bosniaks are a minority. The youngest region of Greece is Xanthi (0.85) which together with the Rhodope (1.43) region represent the regions with highest concentration of Turkish minority. It is interesting that Rhodope region has the larger percentage of Turkish population and higher age index which reminds us that we should be very careful when we attribute any demographic phenomena to a specific religion or ethnicity.

Discussion and Conclusion

The analysis showed what was expected: The Balkans is ageing quickly. The last couple of years are very important, since that is the period the baby boom generations born after WW2 began to reach the age of 65. The implications for society of this fact will be more obvious in years to come. These changes are mostly global, but the Balkans has underlying issues which will make it more sensitive to this change that is already happening. The underlying issues are low fertility and emigration, both of which shaped the age structure. Not every country in the Balkan Peninsula is plagued by these issues to the same degree. This very heterogeneous part of Europe is home to populations that are old, young and somewhere in between. The only truly young parts of the Balkans are Turkey followed by Albania, which has already begun showing the first symptoms of ageing in its age structure. Macedonia, Bosnia and Herzegovina and Montenegro are well on a way of becoming old (ageing index above 1, Figure 4). The rest of the Balkans can already be considered old with Greece and Slovenia at the top of the list. It looks as if this division between young and old countries is along religious borders, considering that all the young countries in the Balkans have a significant Muslim population. Attributing this differentiation to religion is problematic, but it is certainly one of many cultural and historical factors which have contributed to it. This differentiation is also seen at the regional level (Figure 4). Another division that is very pronounced at regional level is urban–remote. The regions with big cities that attract a lot of internal migrants tend to have younger populations. Eastern Serbia and Western

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[11] The northwestern Albanian region of Shkoder on Figure 4 is painted white and ageing index in this region is 0.58 (according to the choropleth key, only 0.02 from being painted gray). In Shkoder the majority of people are Roman Catholics, while in the Southern Albania both Christan Orthodox and Roman Catholic populations are prominent.

Bulgaria form one big, old region in the heart of the Balkans, which epitomizes the urban-remote division. The prospects for the peninsula differ at both national and regional levels. This research confirms that when it comes to age structure the Balkans cannot be viewed as a homogenous whole.

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