POPULATION AGEING AND HEALTH EXPENDITURES IN VISEGRAD GROUP

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Abstract

Quality health care plays an important role in economic growth. Developed countries spend a high proportion of their GDP on health care because they believe that health is an important driver of economic development. Population ageing further increases health expenses, which is a worldwide trend. The purpose of this research is to observe the aftermath from a Visegrad Group (V4) perspective. One of the major consequencies is the growing pool of elderly and retired citizens in the V4 countries. The researchers investigated the causes of ageing in the Visegrad countries, examining mortality and fertility. This situation tends to worsen further in the future finantial threatening of public social and health insurance funds. Elder people use more healthcare than younger people and the proportion of elder people in the population is increasing. We examined trend between the aging population and health expenditure. Health care expenditure (HCE) is not distributed evenly over a person's life course. How much is spent on the elderly is important as they are a population group that is increasing in size.

Key words: population aging, health expenditures, Visegrád Group, forecast

JEL Code: I15, I18, H51

Introduction

The change in human population poses two types of problems to our shared future. The first is the dramatic increase in human population which is primarily caused by the high birth rates in South-East Asia and sub-Saharan Africa. The other problem is observable in so called welfare states where the decrease in the number of births and the increase in life expectancy has resulted in an ageing population. This study examines the latter problem of the two in each region among the Visegrad countries (V4). The ageing population poses several problems, some of them economical (Nagarajan, Teixeira, & Silva, 2016), and at the same time there are also some positive outcomes. Workers who are still active after retirement age are taking part through their experience in the maintenance of competitiveness and the increase in GDP. It is a well

known fact today that the ageing process impacts the body usually resulting in deteriorating health (Wurm et al., 2017). The issue was investigated by the WHO (Xu, Saksena & Holly). Several other studies examine the relationship between life expectancy and health care expenses (Moller, 2003, Coory, 2004, Geuge, Briggs, Lewsey & Lorgelly, 2013, Meijer et al., 2015, Jakooljevic, 2017, Lorenz, Ihle, & Breyer, 2020). Based on this it can be said that medial expenses are affected by the social and individual factors in complex interaction with each other. The demographic indicators we also examined are among the factors predicting costs.

Based on the ageing population and health care expenses, we examined how the GDP, the birth and mortality rates and the ratio of those above 65 years of age affect the extent of health care expenses and their subcomponents. A further important question is the direction of future trends and the preparations the examined countries must complete in the following decades. After examining the literature we have found that although there were several studies on the topic regarding socialist countries (Hoff, 2016, Jakovljevic, 2017), the data from these studies were not up to date and there were no future predictions made. This study aims to fill out the blanks regarding these questions.

1   Population aging

The human population on the planet is constantly increasing at a rapid rate. There were never as many people on the planet as there are today. According to the UN the world population was 7.8 billion on the 17th of September 2020. During the lifetime of the current oldest generation, the population of the earth increased from 2 billion to 7 billion. The basis for growth is technological development and better health care. The industrial use of coal doubled the population, while the use of oil increased the population six fold. The world's population today increases by 80 million people per year and by 2040 there are expected to be 9 billion people on the planet. The two basic indicators of population are the fertility rate and the mortality rate. The difference between these indicators determines whether the population increases or decreases. With regard to past trends it is no accident that scientists have been talking about a population boom for decades. Aside from the increase in population, the other observable trend is the increase in urban population. While in 1960, 30 out of 100 people lived in towns and cities, according to the UN this number will be closer to 70% by 2050.

While the population of developing countries is rapidly increasing, the ageing population in developed countries is causing problems. The reason for an ageing population is low fertility. In developing countries the average children women have is 5-6, while this number

is 1.49[1] in Hungary. At the same time with the increase in the quality of healthcare, life expectancy has also increased. The average life expectancy for Hungarians born in 1941 was 58, the average life expectancy for today's children is 76[2], and by 2050 this will increase to 80. the unavoidable outcome of higher life expectancy is an increase in chronic diseases (non communicative diseases -NCD). This results in an increase in health care expenses. One of the outcomes of this increase is an increase in life prospects. In the Visegrád countries examined by this article, the average life expectancy between 2019-2040 will increase by 5.4%.

Fig. 1: Estimated life expectancies in V4 group
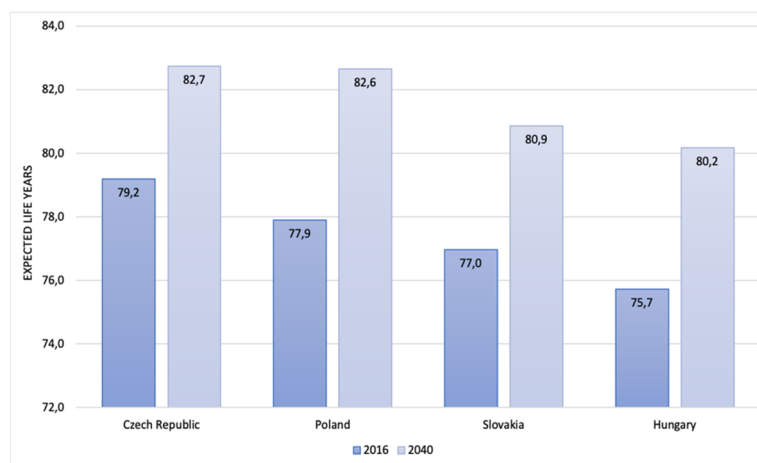
Source: IHME

It is a common occurrence that the percentage of above 65 year olds in the population increases every year. The Visegrád countries show a similar tendency regarding this. In the past fifty ears the greatest increase occurred in Poland where during the examined period the rate of those who were above 65 years of age increased 3,18 times. Based on the predictions made by IMHE, both average life expectancy and the ratio of above 65 year olds will continue to increase. If the trend continues then the average life expectancy will increase by 3-5 years and the ratio of those above 65 with 5-7% by 2040. Health status is also correlated with age. Among those in V4 Countries who are above 65 years of age, 60% in the Czech Republic , 60% in Poland, 66% in Hungary and 43% in Slovakia have a chronic illness. Because of the illness the percentage of those who require care in V4 countries is 14-17%, excluding Poland where this number is 23%.

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[1] HCSO, Hungarian Central Statistical Office (https://www.ksh.hu/thm/2/indi2_1_3.html)
[2] HCSO, Hungarian Central Statistical Office
(http://www.ksh.hu/docs/hun/xstadat/xstadat_eves/i_wnt001a.html?down=80)

2   Healthcare expenditures

As mentioned in the introduction, there are several studies available by different authors regarding health care expenses. In relation to this the consequence of increasing life expectancy is the increase in health care costs. The prediction of IMHE up to 2050 forecasts the continuous increase of these costs worldwide including V4 countries (Fig. 2). Back in 2000 the OECD predicted a similar increase, when health care and social expenses that constituted 16% of the GDP to increase to 25%[3] by 2050. The use of GDP as a form of measurement is explained by the fact that one of the most important factors influencing health care expenses in economic development of which the traditional measurement is GDP.

Fig. 2: Estimated healthcare spending in V4 countries
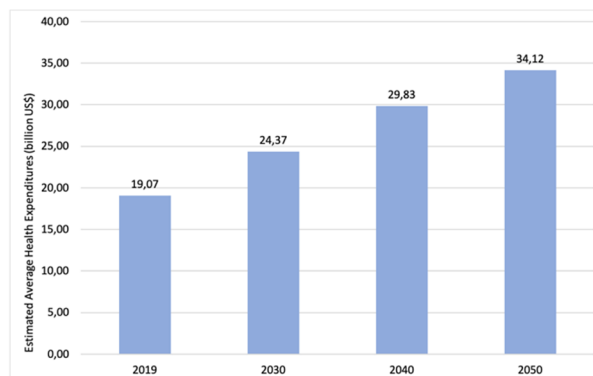
Source: IHME

In terms of services, the resources spent on health care can be best described with health care expenses per capita, which is why we primarily employed this value in our study. It must also be stated that predicting health care expenses in much more difficult than predicting the change in pension for instance as the latter is regulated by specific laws. The increase in expenses is explained by several factors. One of these factors is the continuously improving health care technology where the production and use of tools is continuously getting more expensive. The other factor is the increase in average age which results in a higher ratio of NCD-s.

The financial bases for health care are health insurance systems in all four countries. There are two providers in the Czech Republic and three in Slovakia. In Hungary a single government controlled health insurance fund is responsible for health care services in the whole country. The health care system in Poland is a little more complex: it is financed on the ministry,

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[3] Dang, Antolin, & Oxley, 2001

municipal and county level. The health care expense per capita calculated based on purchasing power was the highest in the Czech Republic in 2017, with Slovakia coming in second followed by Hungary and Poland. The predicted increase of health care expenses for the 2020-2040 period in V4 countries is 25-65%, with the smallest increase happening in Hungary and the greatest in Poland. The difference is even greater when we examine health care expenses per capita: the increase is 36% in Hungary and 80% in Poland.

Fig. 3: Health care expenses per capita calculated on purchasing power
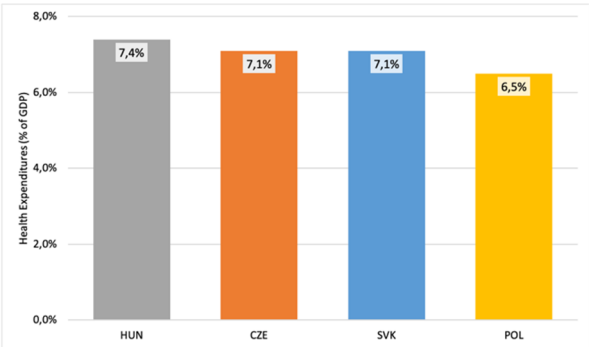
Source: OECD

Among the Visegrád countrues in 2005 the Czech Republic was in first place (1401 USD), and Hungary in second place (1366 USD). By 2017 the Czech Republic retained its leading position (2654 USD), Slovakia took second place (2249 USD) and Hungary slipped back to third place (2045 USD) slightly overtaking Poland (1955 USD).

Fig. 4: Health care expenses in relation to GDP % ratio (2016)
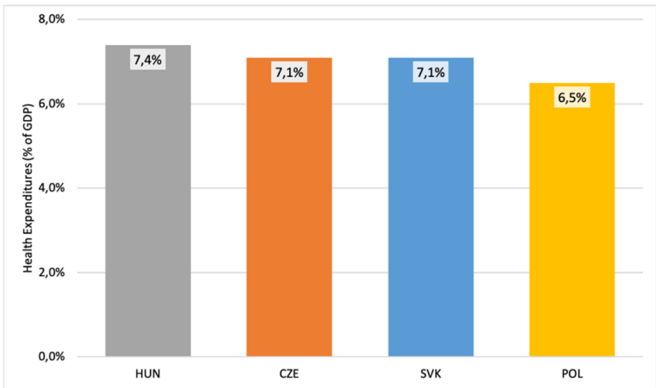
Source: Eurostat

The comparison of the Visegrád countries (Fig.5.) shows us that the Hungarian health care expense ratio compared to the GDP (7,4%) was slightly higher in 2016 than in Slovakia or the Czech Republic (7,1%-7,1%) and significantly higher than in Poland (6,5%).

Fig. 5: The percentage of private expenses in relation to all health care expenses
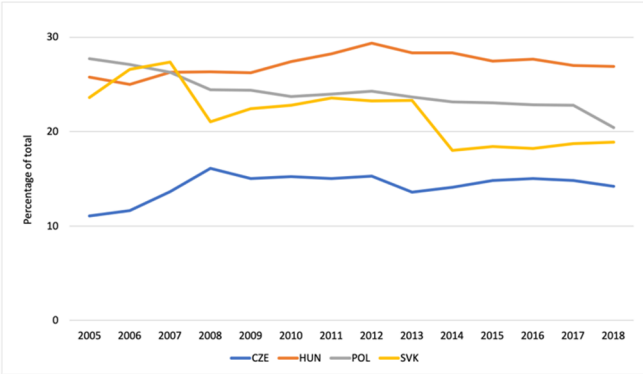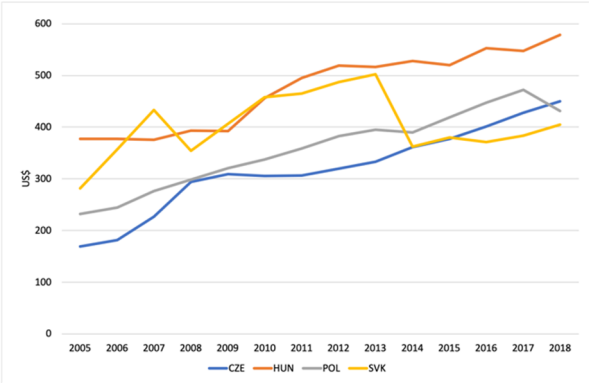

Source: OECD

Regarding health care expenses in V4 countries, private sphere and public contribution is emerging at an increasing rate. The two forms of this are out-of-pocket and prepaid private spending. In Hungary in 2018 health care expenses constituted nearly 30% of all private expenses. In the mid 2000s this number was 25% and it started increasing after the economic crisis. The next country following Hungary among V4 countries was Poland where an opposite process was observed as during the examined period the rate of private expenses decreased from 26% to 23%. in Slovakia the period between 2002 and 2007 began with a strong increasing phase (11% to 27%) which slowly decreased back to 18%. Between 2002 and 2008 the Czech Republic saw a strong increase (10% to 16%) which was later solidified at 14-15%. This means that among the examined countries Hungarians contribute the most towards health care.

A big portion of private expenses is spent on private services (Fig. 6).

Fig. 6: Private health care expenses per capita (USD)

Source: OECD

It is evident by the ratios observable in Fig. 5 that among the V4 countries the highest expenses for private health care were found in Hungary followed by Poland, Slovakia and the Czech Republic. The complexity of health care expenses is demonstrated by the fact that a single person can finance their care from several different sources. Four of such sources were present in our study: government spending, prepaid private health spending, out-of-pocket-health and development assistance for health (DAH).

3   The examination of factors determining health care

As determined previously, health care spending is influenced by several factors. Based on the literature we examined regressive models where the GDP, the population change and the rate of above 65 year olds were established as the determining variables, while the result variables were determined to be the previously examined health care spending types. The time-line contains data from 1995-2040 with the predictions of IHME being used for future data. We will only outline models in this paper that proved to be significant on a global scale (Sig<0.001) and had a multicollinearity value smaller than 5. The results are summed up in Tab. 1

Tab. 1: Summary of results

Health Spending	R^2	Const.	GDPcurr.US$		GDP_PPP		Pop_CHG		Pop65_ratio		Trend (1995=1)	
			B	Beta	B	Beta	B	Beta	B	Beta	B	Beta
Total Health Spending per Person	0.818	-451.368	79.074	0.845			15.86	0.109	66.53	0.225	-17.735	-0.078
Total Health Spending per Person (2019 PPP)	0.816	160.152	73.955	0.790			-3.18	-0.022	54.28	0.183	-8.032	-0.035
Government Spending per Person (2019 PPP)	0.803	-171.542	52.065	0.768			4.29	0.041	56.31	0.262	-6.87	-0.042
Government Spending per Person (2019 USD)	0.775	-481.483	53.913	0.806			14.89	0.143	58.72	0.277	-11.978	-0.074
Out-of-Pocket Spending per Person (2019 PPP)	0.641	-63.571			8.806	0.576		0.051	20.66	0.37	1.971	0.046
Out-of-Pocket Spending per Person (2019 USD)	0.611	29.196	13.127	0.703					9.18	0.155	-3.365	-0.074

The explanatory power of these models is very high at above 60%. The value of the Constant is more of an indicative value and we attribute no special interpretation to it. Five out of the six models employed use GDP per capita calculated at the current rate of US$, while the

sixth model uses the GDP per capita measured according to purchasing power. In almost all cases, the explanatory variable of GDP was the strongest (see beta) and the ratio of above 65 year olds the second strongest. This was followed by the rate of natural increase and decrease and the trend, both of which play a small but significant role. It is apparent in every case that the higher the GDP per capita is in a country, the higher health care spending per capita will be. Government Spending and Out-of-Pocket Spending are also higher in relation to total spending. The increase in the ratio of above 65 year olds in the population also has a positive effect on health care spending in the examined models. The rate of natural increase and decrease is also positively correlated with all types of health care spending, excluding health care spending measured according to purchasing power where the correlation was negative. The trend however almost always has a negative effect which signals that the health care spending per capita is decreasing every year. This shows a decrease in government spending which cannot be compensated for by the slight increase in Out-of-Pocket spending. Among the explanatory variables, with the current US$ 1,000 dollar increase of the GDP, the Total Health Spending per Person increases by 79 US$ (74 calclated based on purchasing power [PPP]). Aside from the 52US$ increase (54 measured in PPP) in Government Spending, Out-of-Pocket Spending also increased by 13 US$. The effects of the growing rate of above 65 year olds is summarized in Fig. 7.

Fig. 7: The effects of 1 percentage point increase in the rate of above 65 year olds on health care spending
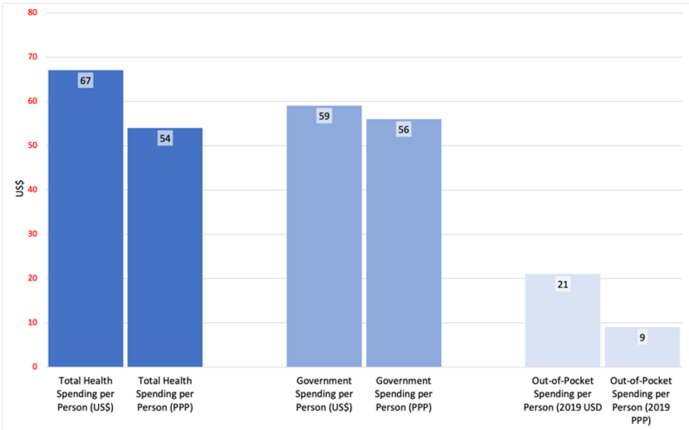
Source: authors own

If population growth per thousand increases by 1, total health care costs increase by US$ 16, but this means a decrease of US$ 3 in purchasing power parity. Meanwhile, the increase in per capita government spending at purchasing power parity is US$ 4, while Out-of-Pocket

Spending is up by US$ 1. At the same time, examining trends, we can say that while health care costs are rising, the total cost per capita, in PPP terms, is falling by $ 8 - including a decrease in government spending of $ 7. The population is unable to compensate for declining government spending, even as the trend in Out-of-Pocket Spending per Person calculated in PPP increases by an average of $ 2.

Conclusion

Population trends and proportions are considerably influenced by family centered policies. Population reduction and ageing are a shared, inherited trend of the V4 countries, to which all four countries have responded with active family centered policies, while on the EU level there is no coherent family policy. The GDP proportional spending of the Czech Republic for this purpose is equal with the OECD average and the home support program receives highlighted treatment. The family policy of Slovakia is characterized by benefits and subsidies due after children. The Polish government commenced its family subsidy program named Family 500+ in 2016, which has resulted in an increase of childbirths by today. Hungary is building a family friendly country relying on domestic resources, the foundation of which is motivating people to have children, the sustainable financing of family budgets with benefits and several other incentives (home subsidy, 5% VAT, tax credits).

Based on future predictions the increase of healthcare cost will be the highest in Hungary, while expected lifespan will grow the most in Poland. It is true for all four countries that by looking at the trends the role of the state in healthcare expenses will not significantly increase by 2040. Because health care expenses for these countries are likely going to increase because of chronic non communicative diseases resulting from an ageing population, the continuous development of health care systems and infrastructure is necessary. It would be possible to increase funding by rethinking investments and implementing innovative funding mechanisms that would include private funding and outside support. The situation could also be improved with the rational use and allocation of resources.

Estimating future expenses is uncertain by nature mainly because it is based on past data and trends. Health care expenses can result in changes in areas such as political decision making, institutional factors, supply and and demand for health care, economic development and other environmental issues such as climate change. Unforeseeable events, such as the unexpected COVID-19 pandemic result in significant and unforeseeable expenses in health care.

To summarize our findings, it is obvious that the increase in the number of elderly people in relation to the entire population is correlated with the increase in health care expenses. Future predictions state that this increase will continue in the following decades. All this makes it necessary for decision makers to find alternative solutions to health care funding, which supplemented by state funded health care would ensure adequate health care services in the future.

For nearly 20 years now, one of the central issues of health economics has been if the ageing of the population in most OECD countries will result in further burdens on taxpayers who finance state run healthcare systems. Specifically, these systems are generally financed from taxes or taxpayer contributions. In the upcoming decades population ageing will reduce the proportion of working age people in the population and will increase the number of pensioners. Since earned wages by far exceed pensions, this will reduce the tax base, thus tax and contribution rates will suddenly increase.

Furthermore, if healthcare costs are higher for elderly people, the increase of contribution rates will accelerate. Considering that funding is also insufficient for other branches of social security (primarily pension), the entirety of social security systems may become unsustainable in the near future. This matter has great political significance, since in consideration of these processes, political leaders will soon have to make tough and extraordinarily unpopular decisions regarding the reduction of healthcare costs, for example with the explicit reduction of healthcare services.

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