

Long Term Health Spending Alongside Population Aging in N-11 Emerging Nations

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Abstract

The rise of “emerging markets” is one of the key changes that is causing the global economic situation to unravel. The Next Eleven (Next-11) countries are known as the second-tier group of “emerging economies” behind the BRICS. Regardless of their diverse socio-geographical characteristics, the Next-11 countries have similarities pointing out to their high economic potential. The paper presents long-term differentials of accelerated population aging and corresponding health expenditure in the Next-11 nations from 1995 to 2013. An increase in the proportion of the elderly population, coupled with falling fertility rates, led the Next-11 countries to increase health care expenditures. Total health spending, expressed as a percentage of gross domestic products, gives clear evidence of growth. Private expenditure on health has been undergoing constant increases in recent years, driven primarily by out-of-pocket spending. Regardless of different health care financing mechanisms, all Next-11 health systems appear to withstand a heavy burden of an aging population, threatening their fiscal sustainability in the upcoming decades.

Keywords: Next-Eleven countries, Health care expenditure, Medical Spending, Population Aging, N-11, Emerging Markets, Trend analysis

JEL classification: I15, P52, J11

Introduction

Today, the key relevance of “emerging markets” is obvious within the global economic scenario. Therefore, investors realize the importance of keeping up to date on emerging markets so as to find the right opportunities (Mokari, 2015). Besides many changes, the high speed of globalization has led to the growth of emerging markets. These classical national economies represent a few among a large number of developing

world countries that are distinguished by their exceptionally strong guarantee of rapid and long-term stable growth of GDP.

As a large pool of countries qualifies to be labeled as emerging markets, it is necessary to determine the priority list of key economies among them. The most widely known group of emerging markets is the BRICS (Brazil, Russia, India, China and South Africa). Their huge participation in global health spending has been recognized in the published literature (Jakovljevic, 2015a). The second-tier economies became known as the Next-Eleven (Next-11 or N-11) countries. The Next-11 countries are Bangladesh, Egypt, Indonesia, Iran, Mexico, Nigeria, Pakistan, the Philippines, South Korea, Turkey and Vietnam. The Next-11 countries are a term coined by investment firm Goldman Sachs in 2005. It presents the potentials of these countries, in the context of infrastructure, urbanization, energy, technology and human capital, so the Next-11 countries become major players on the world stage, such as currently BRICS and Group of Seven (G7) nations (Canada, France, Germany, Italy, Japan, the United Kingdom and the United States) (American International Group, Inc., 2012; Jakovljevic, 2015b).

The Next-11 countries have similar features which distinguish their high economic potential, notwithstanding the different geographical characteristics among them. All the Next-11 countries have large and growing populations. In 2013, the total population of all eleven countries was 1.35 billion (World Health Organization, 2013). All eleven countries show population growth rates in comparison with the population of the Western bloc (Germany, France, Austria, Switzerland, etc.), resulting in greater consumer market potential. These large populations represent a wide potential pool of consumers for large and small enterprises. High growth rates shown that this market will expand rapidly, providing proportionally more potential customers. Therefore, sustained economic growth in the Next-11 countries creates new consumer markets.

The Next-11 countries can be categorized in two different ways (Mokari, 2015): developing economies (Bangladesh, Iran, Nigeria, Pakistan and Vietnam) and newly industrialized economies (all the Next-11 countries with the exception of South Korea). These are both emerging economies, but the latter have greater industrial capacity and typically begin to export heavy manufactured or refined products, while the former ones still largely rely on primary exports, with some industrial capacity. Typically, developing economies have lower standards of living than newly industrialized economies. South Korea is the only

Next-11 economy that could be categorized as a developed economy, owing to its high level of industrialization and relatively stable macroeconomic fundamentals.

According to the all previously demonstrated facts, it could be assumed that the overall economic power of the Next-11 countries significantly affects on the global health domain (health care financing and expenditure), too.

The aim of this study was to describe socio-demographic and health care expenditure indicators of the Next-11 countries. The Next-11 countries were recognized for their high potential to impact global economic landscape in the future. Therefore, we were scanning significant characteristics of the Next-11 countries and presented the most important ones related to health care spending.

Methods

Large international datasets reported by the national authorities to the WHO Global Expenditure Database have been used for a selected set of 11 countries and time horizon 1995-2013 (World Health Organization, 2013a; World Health Organization, 2013b; National Institutes of Health, 2011). The latest official release for almost all the Next-11 countries present in this registry belong to 2013. The historical time horizon 1995-2013 was, thus, selected to reach as deep into the past as officially released data could allow. In order to avoid difficulties imposed by diverse exchange rates of national currencies, out of the variety of currency units offered by World Health Organization Global Expenditure Database one was considered the most appropriate to allow greater international comparability. The currency unit used to present health expenditure data were US\$, current US\$ and current \$PPP (purchasing power parity). The last one, international US\$ calculated on a purchasing power parity basis, is particularly helpful when comparing high-income and developing economies due to their distinctively different civil purchasing power. Therefore, PPP instead of nominal US\$ values were used along with calculations of the share of individual nations in global health expenditures.

The socio-demographic indicators used in the analysis were the number of citizens in the total population, the percentage of population aged under 15 years, the percentage of population aged over 60 years, age, the total fertility rate, the number of live births, the number of

deaths, the ratio between number of live births and deaths, and life expectancy at birth (male vs. female).

Health care expenditure indicators used in the analysis were total health expenditure expressed as a percentage of GDP, total expenditure on health per capita at PPP, general government expenditure on health per capita at PPP, private expenditure on health per capita in current PPP, and out of pocket expenditure per capita in current PPP. Also, the analysis used the percentage of general government and private expenditure on health per capita out of total expenditure on health, expenditure on health for the total population, and the percentage of out of pocket expenditure per capita of private expenditure on health.

Long term health expenditure evolution among emerging Next-eleven nations is shown in tables and figures as total health expenditure as a percentage of GDP, total expenditure on health in millions of current PPP, total expenditure on health in million current US\$, total health expenditure in PPP per capita, general government expenditure on health per capita in current PPP, private expenditure on health per capita in current PPP and out-of-pocket expenditure per capita in current PPP. Long term socio-demographic evolution is shown as the percentage of total population aged 65+ by broad age group according to gender, median age, total fertility, old-age dependency ratio, and the average annual rate of population change of the total population.

Simple descriptive statistics measures such as percentages, means, medians and standard deviations were used in data presentation and interpretation.

Socio-demographic indicators of the Next-11 countries

According to the statistical data of the World Health Organization, the total population for all the Next-eleven countries in 2013 was 1,358,324,000 (World Health Organization, 2013a). Indonesia had the most citizens according to all the Next-11 countries- 249,866 thousands (Table 1). In the second place there was Pakistan (182,143 thousands), followed by Nigeria, Bangladesh, and Mexico. Other countries in this group had less than 100 million citizens (in the range from 49,263 thousands to 98,394 thousands). These 1.35 billion people, more than a fifth of the world's population, represents an enormous human potential for the economic development of these countries, but also large consumption of healthcare expenditure.

The distribution of the population according to age is shows that Nigeria had the highest proportion of the population of ages less than 15 years (44%), followed by the Philippines (34%), Pakistan (34%) and Bangladesh (30%) (Table 1). Apart from this fact, population over 60 years was the most common in South Korea (17% of the total population), Turkey (11%), Mexico (10%) and Vietnam (10%). Generally, the youngest population of all the Next-11 countries had Nigeria (median age was 18) while the oldest had South Korea (median age was 39) (Table 1). The demographic structure of the population is very significant, because it affects nation's key socio-economic issues, primarily on a health spending.

Next-11 countries	Total population	Population aged under 15 (%)	Population aged over 60 (%)	Median age (years)
Philippines	98,394,000	34	6	23
Mexico	122,332,000	29	10	27
Nigeria	173,615,000	44	5	18
Pakistan	182,143,000	34	7	23
Vietnam	91,680,000	23	10	30
Egypt	82,056,000	31	9	25
Indonesia	249,866,000	29	8	28
Iran	77,447,000	24	8	29
Bangladesh	156,595,000	30	7	25
Turkey	74,933,000	26	11	29
South Korea	49,263,000	15	17	39

Table 1. Basic statistics of the Next-eleven countries- indicators of aging (the data are from 2013; World Health Organization- Countries: <http://www.who.int/countries/en/>)

Population aging is a phenomenon that occurs when the median age of a country rises due to rising life expectancy and/or declining birth rates (Ogura and Jakovljevic, 2014; Kinsella and Velkoff, 2001). According to the World Health Organization, the number of people over 65 years was proposed to grow from 524 million (8% of the total world's population) in 2010 to nearly 1.5 billion in 2050, with most of the increase in developing countries (National Institutes of Health, 2011). Although there has been an increase in life expectancy which causes the aging of population, initially in the more economically developed countries as well as in less economically developed countries, statistical data of the Next-11 countries demonstrate that these countries do not

have this problem. These countries have a high potential for a socio-economic development, because the problem with a population aging doesn't characterize these countries. Driving factors for a population aging were the technological revolution in medicine, which succeeded in saving lives from many acute and chronic illnesses, and the changing social role of women, which is more and more included into society (Ogura and Jakovljevic, 2014).

The total fertility rates were in the range between 1.3 and 6.0 per woman in the Next-11 countries (Table 2). Nigeria had the highest total fertility rate in relation to the others of the Next-11 countries. The number of live births and number of deaths of all the Next-11 countries show that all countries have higher birth rate according to mortality. If we observe the ratio of the number of live births and number of deaths (Table 2), Philippines had 4.13 times more live births than to the number of deaths. This ratio is the smallest in South Korea (1.75 times). Generally, all countries had higher birth rate according to the mortality that is shown as a high potential for a socio-economic development of these countries, too.

Next-11 countries	Total fertility rate (per woman)	Number of live births (thousands)	Number of deaths (thousands)	Ratio between number of live births and deaths	Life expectancy at birth male/female (years)
Philippines	3.0	2403.9	582.7	4.13	65/72
Mexico	2.2	2251.7	647.0	3.48	73/79
Nigeria	6.0	7173.0	2071.4	3.46	53/55
Pakistan	3.2	4599.4	1329.3	3.46	64/66
Vietnam	1.7	1424.0	527.9	2.70	71/80
Egypt	2.8	1901.5	527.4	3.61	69/74
Indonesia	2.3	4690.6	1561.2	3.00	69/73
Iran	1.9	1455.5	398.3	3.65	72/76
Bangladesh	2.2	3137.7	886.2	3.54	69/71
Turkey	2.0	1260.5	426.1	2.96	72/78
South Korea	1.3	472.4	270.6	1.75	78/85

Table 2. Basic statistics of the Next-eleven countries- indicators of mortality and live births (World Health Organization- Countries: <http://www.who.int/countries/en/>)

The longest life expectancy at birth for male was 78 years and female 85 years in South Korea, while the shortest was in Nigeria (for male was 53 years and female, 55), according to the World Health Organization (Table 2). In 1990, life expectancy at birth for male was 68 years and for female was 76 years in South Korea, while in Nigeria it was 45 for males and 47 for females (World Health Organization, 2013b). Since it will have an effect on rising health care costs, policy makers and public health experts are considerably attracted to these life prolongations related to both genders.

Generally, the huge demographic transition in the most of the world's countries took place in majority of modern-day nations and it is characterized by decreasing fertility, better neonatal survival, falling death rates, and gains in longevity (Ogura and Jakovljevic, 2014). All of these profound changes that are caused by improvements in the welfare of the nations, education and the entry of women into the labor market and achievements of modern-day medicine are beneficial for population aging (Jakovljevic, 2015c).

Health care expenditure indicators of the Next-11 countries

Total health expenditure expressed as a percentage of GDP was the greatest in South Korea (7.17%) and Mexico (6.24%) (Table 3), while the lowest was in Pakistan (2.75%). In the most developed countries, this indicator of total health expenditure expressed as a percentage of GDP was in the range from 20% to 10%. This indicator was the highest in the United States (17.10%) and Tuvalu (19.72%), while in the Netherlands it was 12.89%, France 11.66%, Switzerland 11.47%, Germany 11.30%, etc.

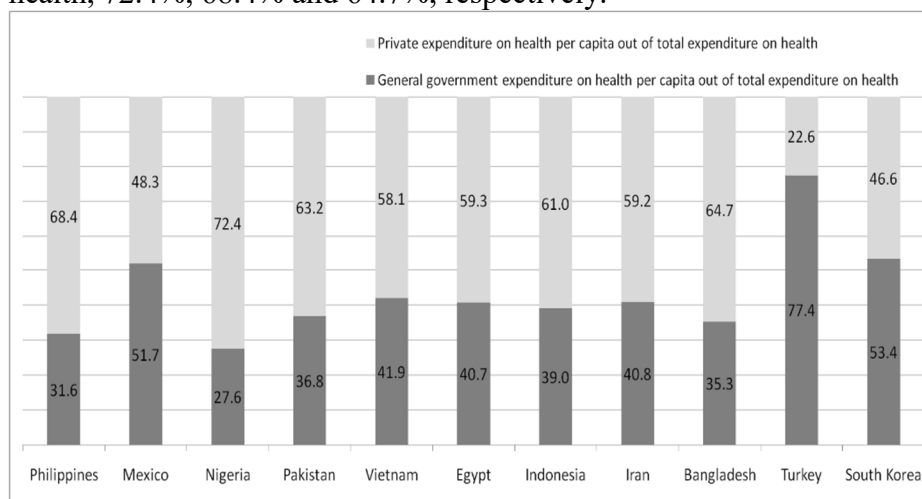
The higher total health expenditure expressed as a percentage of GDP in developed countries in comparison with the countries labeled as "emerging markets" may be explained by the growth and aging of the population (Ogura and Jakovljevic, 2014; Mendelson and Schwartz, 1993). Developed countries have the lower growth of the population and the higher aging of the population in comparison with developing countries. These facts result in higher total health expenditure expressed as a percentage of GDP in developed countries than developing countries, as the Next-11 countries (Jakovljevic *et al.*, 2016a). For any developed country, an increase in the proportion of the elderly population presents an increase in health care expenditure per capita

(Sghari and Hammami, 2014). Taking into account that individual health care expenditure is an increasing function of age, this fact is true.

Total expenditure on health per capita at purchasing power parity (PPP) was the greatest in South Korea (\$2398.42) and Iran (\$1414.50), while it was the lowest in Pakistan (\$126.33) and Bangladesh (\$95.33) (Table 3). Total health expenditures in the Next-11 countries were lower in comparison with health expenditures of developed countries. For example, total expenditure on health per capita in 2013 was \$9145.83 in the United States, \$4333.58 in France, \$4811.82 in Germany, and \$3741.34 in Japan. However, if these health expenditures are multiplied by total population, huge health expenditure is included in the Next-11 countries (Total health care expenditure of the Next-11 countries was about \$686,143.9 millions). Expenditure on health for the total population of the Next-11 countries is shown in the figure 2. The highest total health expenditures were in Mexico, South Korea and Iran, \$129,810.2 million, \$118,153.4 million and \$109,548.8 million, respectively.

A percentage of general government expenditure on health and private expenditure on health per capita of total expenditure on health are very significant indicators of health expenditure. The share of government expenditure is highest in Turkey, South Korea and Mexico, 77.4%, 53.4% and 51.7%, respectively (Figure 1). On the other hand, Nigeria, the Philippines and Bangladesh had the greatest percentage of private expenditure on health per capita out of total expenditure on health, 72.4%, 68.4% and 64.7%, respectively.

Fig. 1. Percentage of general government and private expenditure on health per capita out of total expenditure on health



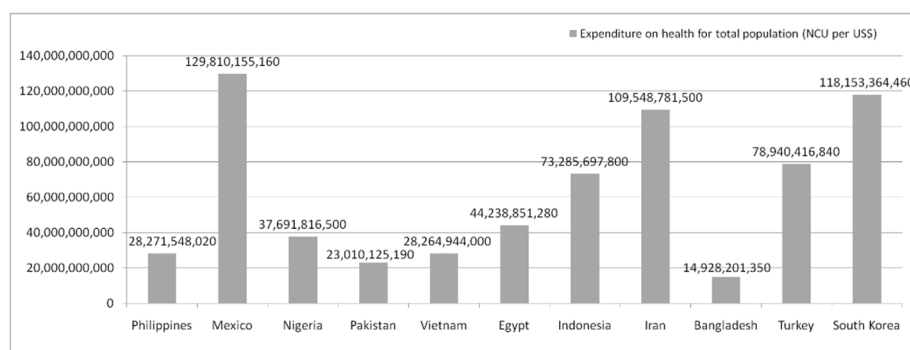
Next-11 countries	Total health expenditure % GDP	Total expenditure on health per capita at purchasing power parity (PPP)[national currency units per US\$]	General government expenditure on health per capita PPP (NCU per US\$)	Private expenditure on health in current PPP, per capita (NCU per US\$)	Out of pocket expenditure in current PPP, per capita (NCU per US\$)
Philippines	4.40	287.33	90.92	196.41	162.84
Mexico	6.24	1061.13	548.98	512.15	468.46
Nigeria	3.88	217.10	59.88	157.21	150.56
Pakistan	2.75	126.33	46.46	79.87	69.32
Vietnam	5.95	308.30	129.13	179.17	152.33
Egypt	5.06	539.13	219.31	319.82	312.53
Indonesia	3.07	293.30	114.35	178.95	134.37
Iran	6.69	1414.50	576.98	837.52	737.10
Bangladesh	3.73	95.33	33.61	61.72	57.41
Turkey	5.59	1053.48	815.48	238.00	157.83
South Korea	7.17	2398.42	1280.34	1118.08	878.72

Table 3. Health care expenditure indicators of the Next-eleven countries in 2013 (World Health Organization- Global Health Expenditure Database: <http://apps.who.int/nha/database/Select/Indicators/en>)

Private health insurance presents either opportunities or risks for the attainment of health system performance goals (Colombo and Tapay, 2004). In countries where private health insurance plays a very important role, it can be credited with having inserted resources into health systems and helped to make the systems more responsive. However, it has also given rise to considerable equity challenges in many cases and has increased health care expenditure in most of those same countries. If public funding is low, private insurance can serve as a transitional mechanism, building capacity and providing financial protection for certain segments of the population (vulnerable groups: children, the unemployed, and people with disabilities and special needs, etc.) (Colombo and Tapay, 2004). Notwithstanding that a country considers private health insurance to be a transitional measure on the road towards

a comprehensive public funding system or an unwelcome but irrepressible guest, private health insurance is a very important factor in health financing.

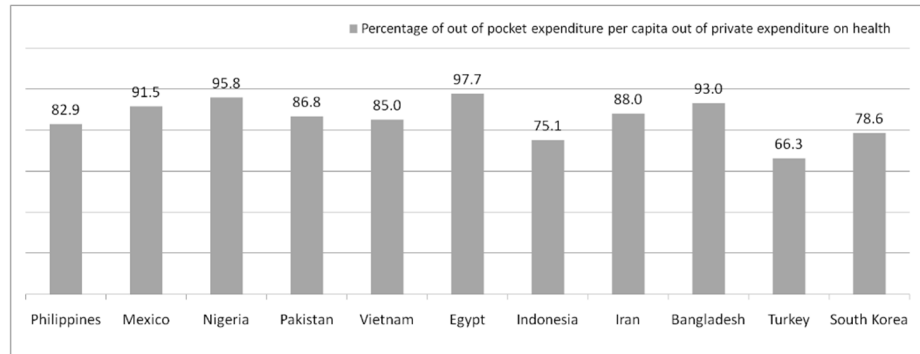
Fig. 2.
Expenditure on health for the total population of the Next-11 countries (NCU per US\$)



Out of pocket expenditure is any direct outlay by households, including gratuities and in-kind payments, to health practitioners and the suppliers of pharmaceuticals, therapeutic appliances, and other goods and services whose primary intent is to contribute to the restoration or enhancement of the health status of individuals or population groups (The World Bank, 2013). A percentage of out of pocket expenditure per capita out of private expenditure on health per capita was in the range from 75.1% to 97.7% (Figure 3). This aspect of private expenditure on health was significantly higher in proportion to private insurances and non-profit institutions serving households. In comparison with developed countries, this part of private expenditure health is higher, the United States 20.7%, the United Kingdom 56.8%, France 32.1%, and Germany 50.8%. This fact may be explained by the highly developed private health insurance systems in these developed countries (Mendelson and Schwartz, 1993; Sekhri and Savedoff, 2004). Private health insurance has three distinct functions (Greß, 2007). The first is as an alternative to social health insurance arrangements. The second function is to supplement basic health insurance, providing coverage for services that are not covered by social insurance or to cover the financial risks of co-payments and co-insurance. A third function of private insurance is to provide what can be termed as complementary or double-coverage coverage, in which individuals purchase additional private insurance even while they have to take part in existing public schemes. For example, almost 90% of the population in Germany is covered by social health insurance, while about

10% have taken out alternative private health insurance as a substitute for social health insurance (Wasem *et al.*, 2004).

Fig. 3. Percentage of Out of pocket expenditure per capita of Private expenditure on health



Long term health expenditure evolution among emerging Next-eleven nations

A global health expenditure database relying on national health accounts system to follow financial flows within national health systems of all World Health Organization members across the globe, was established since 1995 with latest official release of 2013 data (Global Health Expenditure Database (GHED), 2011). This is probably the most comprehensive single source allowing for international comparability of statistical data. Observing these 19 years, we might come to terms with many fine or hidden patterns of health spending transformation that have occurred worldwide and among the Next-11 countries themselves.

Long-term health expenditure evolution among emerging the Next-11 nations is presented through the most important indicators of consumption in the period between 1995 and 2013, according to data of the World Health Organization.

All the health care expenditure indicators of the Next-eleven countries showed a long-term increase (Tables 4 and 5 and Figures 4-8). The average of global share of the Next-11 countries in total health expenditure grew from 3.66% to 4.96% [from \$5,788 to \$31,327 in nominal terms (\$USD) or from \$13,418 to \$62,215 in purchasing power parity (PPP) terms] (Figure 4-6). Joint health expenditure by the Next-11 countries succeeded to raise by a few times in less than two decades. On the other hand, total health expenditure PPP per capita was increased about 4-fold, from \$178 to \$709, during these 19 years (Figure 7).

Long-term evolution of general government, private and out of pocket expenditure on health in current PPP, per capita in the Next-eleven countries is shown in the Figure 8. These indicators of health expenditures presented significant increases during a 19-year period. The average of general government, private and out of pocket expenditure on health in current PPP, per capita increased few hundred percent in 2013 in comparison with the expenditures in 1995, from \$75 to \$356, from \$103 to \$353 and from \$94 to \$298, respectively.

During the last decades of the 20th and the first decades of the 21st century, public health expenditure has been growing faster than national income (Maisonneuve and Martins, 2006). Generally, population size, age structure, health status, income, relative prices, technological advances in medical treatments, and institutional settings have been advanced as explanatory factors. Demographic factors, such as population aging, are shown in the studies, to have a positive effect on expenditure growth. In comparison with other drivers, such as income, technological advances in medical treatments, relative prices and institutional settings, it is second-order effect (European Commission (DG ECFIN)-EPC (AWG), 2012). This rapid long-term increase in health care expenditure reflected the broadening of insurance coverage in the most countries.

Next-11 countries / Year	Total health expenditure (THE) % GDP		Total expenditure on health in million current PPP		Total expenditure on health in million current US\$		Total health expenditure PPP per capita	
	1995	2013	1995	2013	1995	2013	1995	2013
Nigeria	2.82	3.88	9,786	37,691	4,167	19,960	90	217
Mexico	5.15	6.24	35,359	125,632	16,156	78,655	388	1,061
Egypt	3.86	5.06	11,323	46,030	2,324	12,915	185	539
Iran	3.83	6.69	16,196	108,078	4,072	33,029	268	1,414
Pakistan	3.27	2.75	9,848	23,142	1,927	6,756	78	126
Turkey	3.37	5.59	10,664	79,672	5,706	45,959	174	1,053
Bangladesh	3.52	3.73	3,655	14,928	1,333	4,954	30	95
Indonesia	1.95	3.07	15,995	73,285	3,949	26,644	82	293
Philippines	3.45	4.40	6,969	28,271	2,557	11,964	100	287
South Korea	3.84	7.17	22,227	119,374	20,402	93,573	493	2,398
Vietnam	5.19	5.95	5,572	28,265	1,076	10,192	73	308

Table 4. Long term evolution of health care expenditure indicators in the Next-eleven countries

Next-11 countries / Year	General government expenditure on health in current PPP, per capita		Private expenditure on health in current PPP, per capita		Out of pocket expenditure in current PPP, per capita	
	1995	2013	1995	2013	1995	2013
Nigeria	23	60	67	157	64	151
Mexico	163	549	224	512	218	468
Egypt	86	219	99	320	89	313
Iran	120	577	148	838	144	737
Pakistan	20	46	57	80	56	69
Turkey	123	815	52	238	52	158
Bangladesh	11	34	19	62	19	57
Indonesia	29	114	53	179	38	134
Philippines	40	91	61	196	50	163
South Korea	185	1,280	308	1,118	262	879
Vietnam	25	129	48	179	46	152

Table 5. Long-term evolution of health care expenditure indicators in the Next-eleven countries

Fig. 4. Long term evolution of total health expenditure as percentage of GDP in the Next-eleven countries

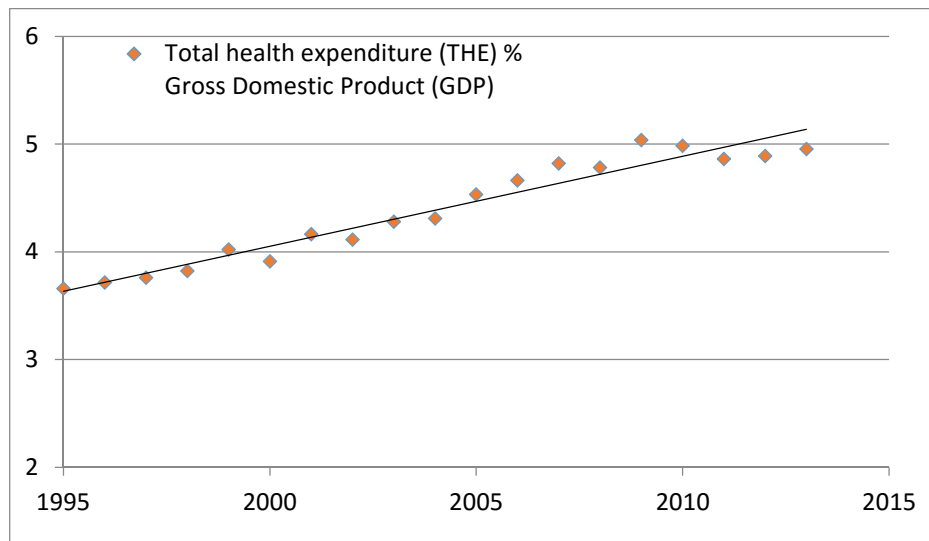


Fig. 5. Long term evolution of total expenditure on health in million current PPP in the Next-eleven countries

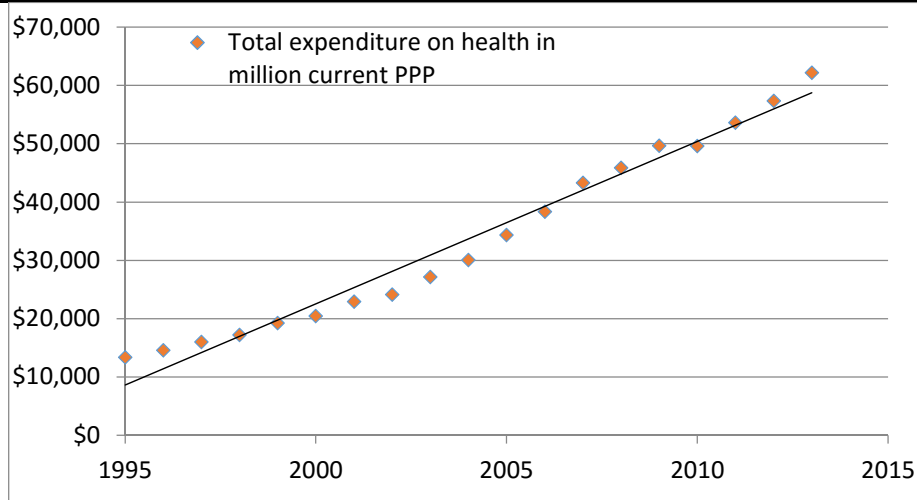


Fig. 6. Long term evolution of total expenditure on health in million current US\$ in the Next-eleven countries

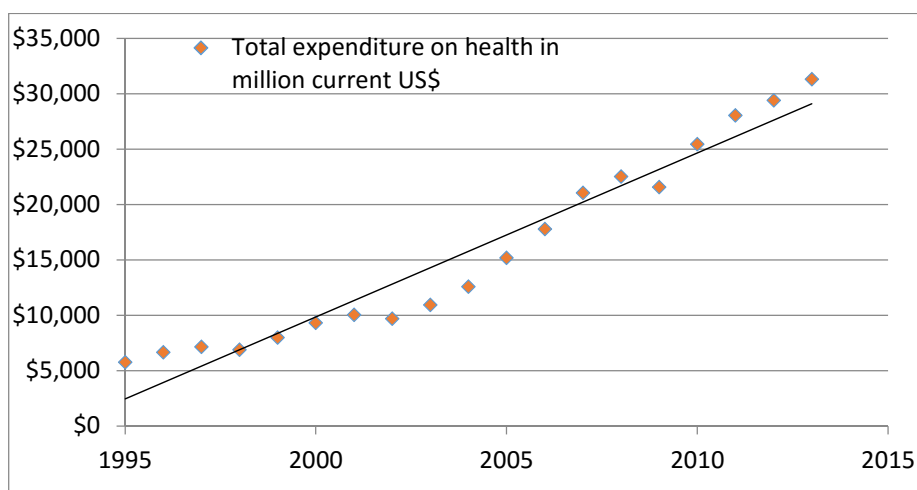


Fig. 7. Long term evolution of total health expenditure PPP per capita in the Next-eleven countries

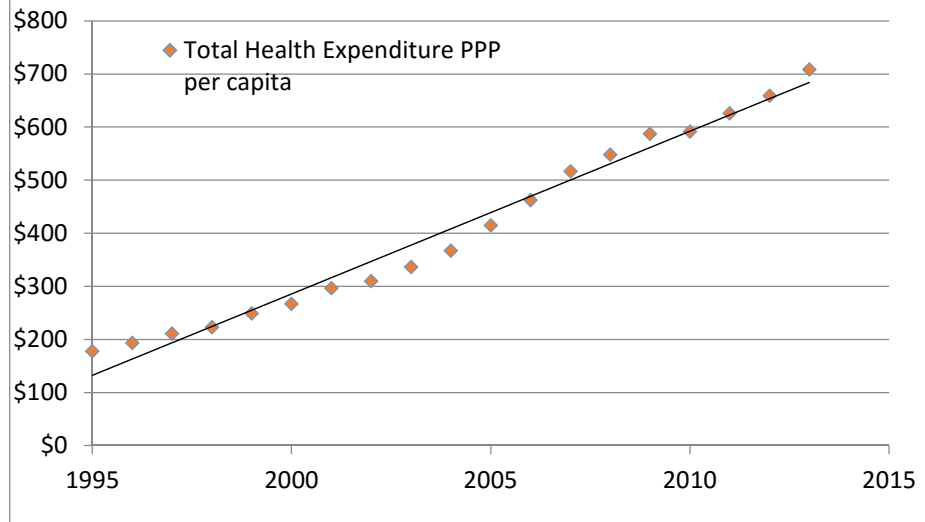
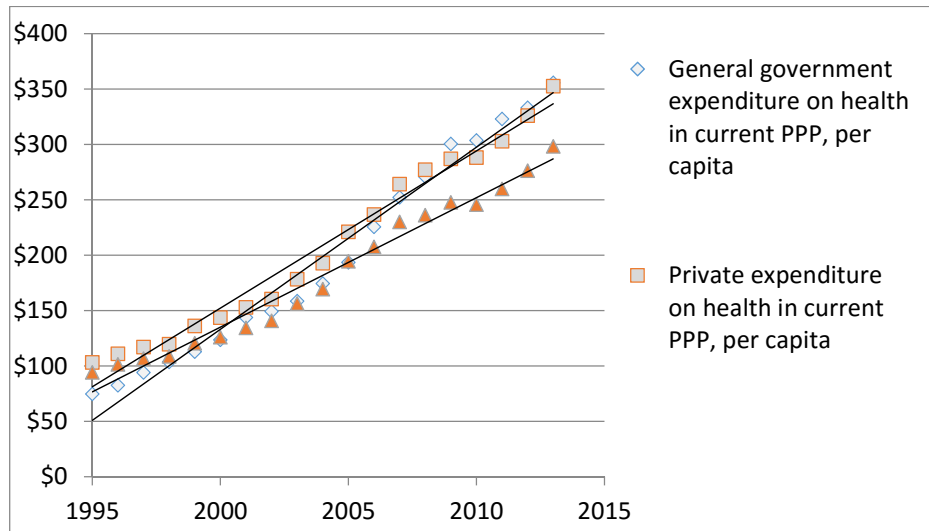


Fig. 8. Long term evolution of general government, private and out of pocket expenditure on health in current PPP, per capita in the Next-eleven countries



Discussion

Health care expenditures are shown as a constant increasing trend in most developed and developing countries as well (Jakovljevic and Getzen, 2016). Their growth rates are generally higher than the growth of the overall economy, and as a result, the ratio of the total health expenditure in proportion to the GDP has been rising continuously.

Every year health care expenditures rise due to various reasons. In the first place there are the growth and aging (Jakovljevic and Laaser, 2015) of the population (Ogura and Jakovljevic, 2014; Mendelson and Schwartz, 1993; Jacobsen *et al.*, 2011). However, new expensive medical methods and high-cost innovative drugs are also significantly affected by the health care expenditures (Alpern *et al.*, 20114; Jakovljevic, 2015d).

The average percentage of elderly population aged 65 and older increased from 3.7% in 1975 to 6.1% in 2015 among the Next-11 countries (Figure 9). Median age increased from 18.35 to 27.52 years in the Next-11 countries during period from 1975 to 2015 (Figure 10). Mean fertility rates decreased from 5.48 in 1975 to 2.63 children per woman in 2015 among the Next-11 countries (Figure 11). The old age dependency ratio increased from 6.94 to 9.15 on average among the Next-11 countries (Figure 12). The population growth rate decreased from 2.55 to 1.40 on average in the Next-11 countries (Figure 13).

The increase in median age is accelerating in most of the world regions (Lutz *et al.*, 2008). So far there are only few exceptions - 18 countries, so called demographic outliers encompassing Afghanistan and the countries of Sub-Saharan Africa (Velkoff and Kowal, 2007). As we approach the end of 21st century, these regions are most likely to experience similar changes but with long delay of the several decades. In addition to the aging, the blessing of longevity brings as well the curse of the increased medical needs of the elderly. Developed countries had several historical advantages compared to their Third World counterparts. At first this demographic transition in these countries began earlier and has progressed much further. Traditionally, well-established national health systems with sustainable funding and effective management and resource allocation practices were common to these countries (Ogura, 1994). Mature economies, although facing with severe financial constraints due to population aging, had extensive networks of medical facilities covering rural territories and quite equitable access and affordability of health care. Certainly the most typical example of the oldest large nation with high performance health system is Japan, whose longevity remains unprecedented (Ogura and Jakovljevic, 2014).

A number of people require numerous medical services due to the growth and aging of the population. Also, these medical services require treatment with the number of new (or old), expensive medical methods. In addition to aging population, the blessing of longevity brings as well

the curse of the increased medical needs of the elderly one. The single last year of life is frequently more expensive than entire life span of the individual citizen (Kovacevic *et al.*, 2015).

Fig. 9. Percentage of total population aged 65+ by broad age group, both genders in the Next-eleven countries

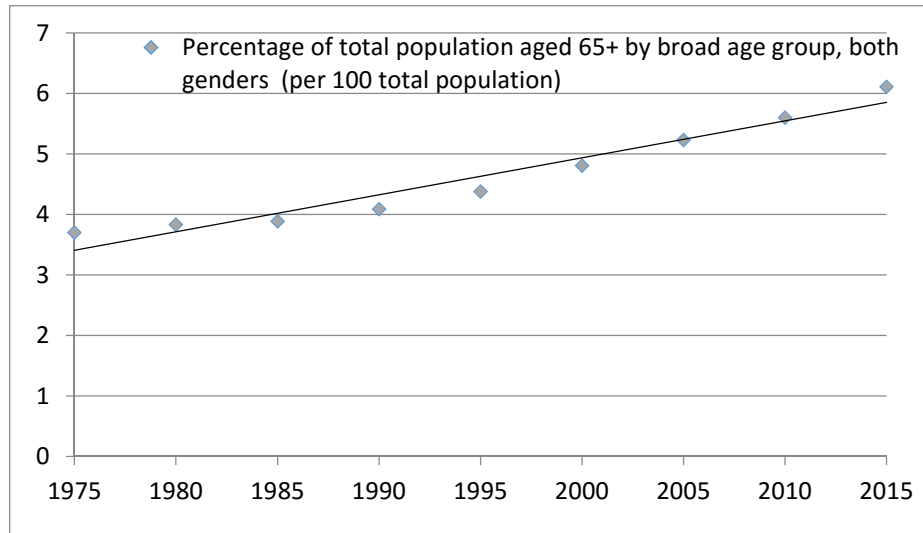


Fig. 10. Median age of the total population in the Next-eleven countries

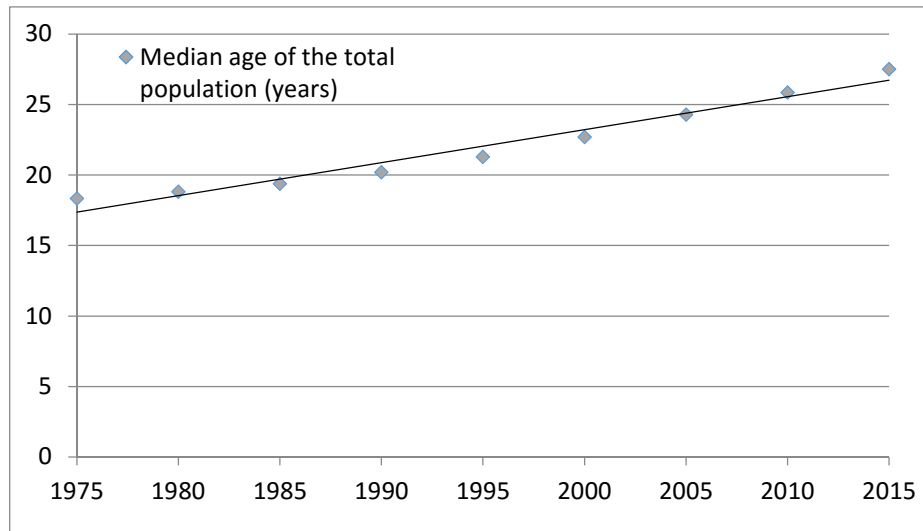


Fig. 11. Total fertility of the total population in the Next-eleven countries

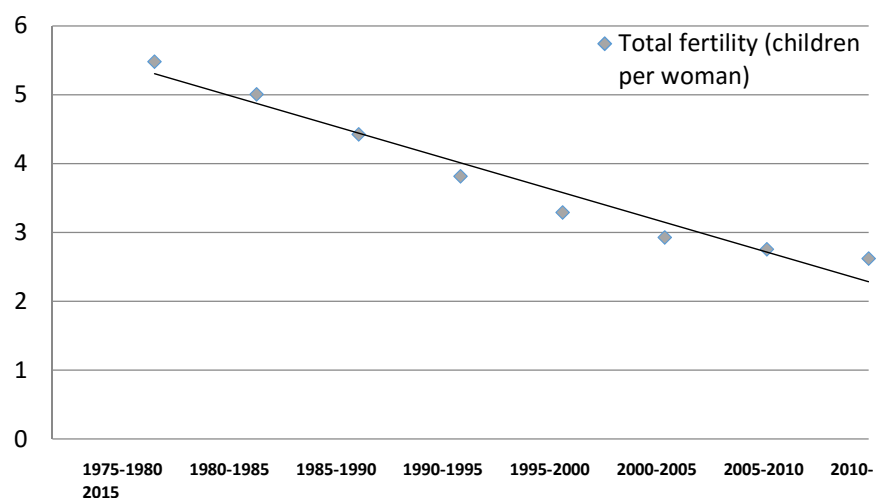


Fig. 12. Old-age dependency ratio of the total population in the Next-eleven countries

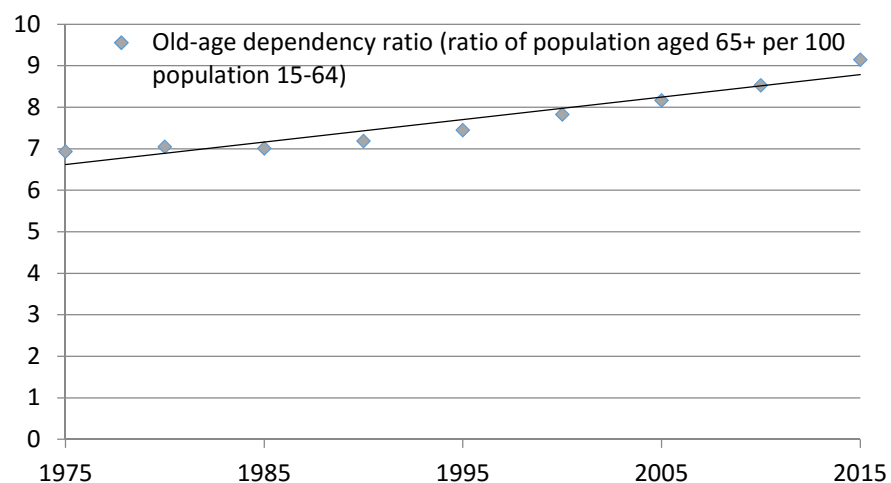
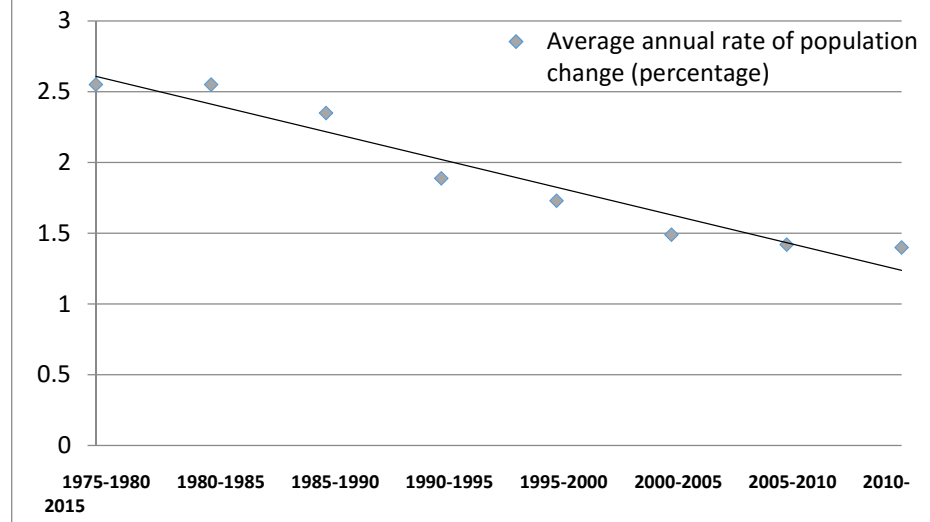


Fig. 13. Average annual rate of population change (percentage) of the total population in the Next-eleven countries



Savings within the European Union health care expenditure; achieved by generic substitution, amount to €30 billion (Shepard, 2010). It is well known that new brand-name drugs are often expensive (Sghari and Hammami, 2014). Numerous factors may cause price increases for generic drugs: drug shortages, supply disruptions, and consolidations within the generic drug industry (Government Accountability Office, 2009). This opens potential for significant net savings to the national health systems (Jakovljevic *et al.*, 2014). The largest consumers were drugs for the therapy groups: oncologics, antihypertensive, antidiabetics, lipid regulators, antipsychotics, platelet aggregation inhibitors, antiulcerants and few others (Jakovljević, 2014a). Particularly expensive therapy is the therapy with biological drug (Shaughnessy, 2012). The average cost for the top 9 drugs from the therapy group of biological drug was more than \$200,000 a year in the USA (Herper, 2010).

Biological drugs introduce new economic considerations. Biological drugs were significantly expensive in comparison with conventional therapy. For example, new oncology drugs in the biological group have rapidly affected the cost of colorectal cancer (Karaca-Mandic *et al.*, 2011). Biological drugs in line with standard conventional protocols for the therapy of the patients with colorectal cancer have been largely substituted for older regimens as first-line therapy for metastatic colorectal cancer. These treatment changes have resulted in large expenditure increases for colorectal cancer care. If biological drugs

include monoclonal antibodies, costs can escalate exponentially. For example, multidrug colorectal cancer treatment regimens containing bevacizumab or cetuximab cost up to \$30,790 for eight weeks of treatment, compared with \$63 for an eight-week regimen of fluorouracil and leucovorin, the standard treatment until the mid-1990s (Schrage, 2004; Micromedex healthcare series, 2015; UpToDate, 2015; Gerber, 2008). Generally, new treatments of biological drugs (primarily with monoclonal antibodies) have increased the cost of existing regimens for numerous diseases (Fragoulakis *et al.*, 2015; Eriksson *et al.*, 2015; Akinbosoye *et al.*, 2012; Sizto *et al.*, 2009; Jakovljevic, 2014b; Cancer Research UK, 2014).

On the other hand, pharmaceutical innovations significantly affect the hospital utilization. It is estimated that an increase in the number of molecules, used to treat a disease, reduces the number of hospital days due to the disease, approximately 1% per year (Lichtenberg *et al.*, 2014). Therefore, pharmaceutical innovations should be used for the treatment of the new/old diseases. Although they are more expensive in comparison with the old conventional therapy, they significantly improve the treatment and treatment outcome. Due to the fact that traditional therapy is no longer able to provide adequate healthcare services in proportion to a large percentage of a growing population, rapid development of medical technologies can be used to enhance therapy outcomes but at the additional cost (Jakovljevic *et al.*, 2015).

Conclusion

Long-term differentials point to accelerated population aging in the Next-11 nations. The increase of the percentage of elderly population aged 65 and older, the median age, and the old-age dependency ratio, but decreases of fertility rates and the population growth rate in the Next-11 countries led to increased health care expenditures (Ogura and Jakovljevic, 2014).

On the other hand, the Total health expenditure expressed as percentage of GDP is also shown to have increased. It is very interesting that the Private expenditure on health is shown as a constant increase, but also out of pocket expenditure on health as part of the private health expenditure.

The aging of the total population, and the substantial changes in age structure that will be caused, are inevitable. The number of people and

share of the population of ages of 65 and older are unprecedented in worldwide history. Demographic change will have substantial adverse effects on the economy and on the long-run productive potential of worldwide health care expenditure (Jakovljevic *et al.*, 2016b).

If these countries were richer, the total amount of healthcare spending would increase. The model of health care financing mechanisms appears not to be a key driver for raising healthcare costs, as all observed countries showed similar growth in spite of relative different financing models among them.

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