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EVOLVING HEALTH EXPENDITURE LANDSCAPE OF THE BRICS NATIONS AND PROJECTIONS TO 2025

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ABSTRACT

Global health spending share of low/middle income countries continues its long-term growth. BRICS nations remain to be major drivers of such change since 1990s.

Governmental, private and out-of-pocket health expenditures were analyzed based on WHO sources. Medium-term projections of national health spending to 2025 were provided based on macroeconomic budgetary excess growth model.

In terms of per capita spending Russia was highest in 2013. India's health expenditure did not match overall economic growth and fell to slightly less than 4% of GDP. Up to 2025 China will achieve highest excess growth rate of 2% and increase its GDP% spent on health care from 5.4% in 2012 to 6.6% in 2025. Russia's spending will remain highest among BRICS in absolute per capita terms reaching net gain from \$1523 PPP in 2012 to \$2214 PPP in 2025.

In spite of BRICS' diversity, all countries were able to significantly increase their investments in health care. The major setback was bold rise in out-of-pocket spending. Most of BRICS' growing share of global medical spending was heavily attributable to the overachievement of People's Republic of China. Such trend is highly likely to continue beyond 2025.

KEY WORDS: BRICS; global health; health expenditure; trend; medical spending; emerging markets; future forecasts; projections

1. EVOLUTION OF NATIONAL MEDICAL SPENDING AND SYSTEMS

The development of a modern national medical system requires four factors: Wealth, Longevity, Medical Technology, Medical Financing and Organization. Wealth provides a buffer against risk, freedom from malnutrition and the ability to invest in knowledge and social capital. Without longevity, the risk of sudden death dwarfs the marginal impact of medicine, making incremental progress less valuable. By the late 19th Century, demographic transition (Lee, 2003) and continuous productivity improvements made wealth and longevity available to most citizens among the advancing group of industrialized nations. Discoveries regarding antiseptics, anesthesia, bacteria, diagnostics and the synthesis of organic chemicals laid the scientific groundwork for what would later become modern medical therapeutics. Precursors of modern organization and financing were provided by the rise of specialty clinics in French Hospitals, Bismarck's health insurance

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scheme in Germany (Bärnighausen and Sauerborn, 2002), as well as medical licensure and the formation of friendly societies in England. The beginnings of modern medicine were clearly in place on the eve of the Great War in 1913, yet there was not yet any body of effective medical practice, nor any organized national systems of health care. Only after the passage of two world wars, the great depression and decades of scientific research did modern medical systems begin to take shape. Still nascent in the 1950s, most leading industrial nations had established national systems by 1975 that are still recognizable today (House, 2002).

The creation of modern medicine was costly. Vast sums were required to fund new medical technology, continuous research and trained professionals. This forced the creation of extensive medical financing networks, pooling social and private insurance with personal payments from patients, philanthropy and taxes. Even though per capita income was rising rapidly, medical expenditures grew even faster surging past 6% of GDP by 1975 (Getzen, 1991).

It can be useful to group countries into four cohorts. The first to develop national health systems were the European nations already industrialized in the 19th century inclusive of Russia, along with Australia, Canada, Japan, New Zealand and the USA that made up the original OECD. The second are those that subsequently aligned with the OECD and built their own national systems in the following decades such as the Czech Republic, Estonia, Hungary, Mexico, Poland, Slovak Republic, Slovenia, South Korea, Singapore and Turkey, often relying heavily on the initial cohort as models (Jakovljevic, 2013). A third cohort consisting of China, India, Brazil, South Africa and many other countries has now begun to follow. The legacy of the former Soviet Union was the historical Semashko system was the first to deliver universal health coverage free of charge for all its citizens since the early 1930s (Semashko, 1934). It could be claimed that by 2020 a majority of the people in the world will be living in countries with comprehensive national systems to provide and finance health care (Getzen, 2014). Many emerging market countries are still in their formative stages, but are rapidly making progress. However, there is also a fourth cohort of less-developed countries that continues to struggle and has not yet been able to make organized health care widely and readily available to most of their citizens.

2. DATA AND ESTIMATES OF NATIONAL HEALTH SPENDING

Data on national health expenditures across emerging economies are of variable quality and restricted to recent years. The annual *OECD Health Data* files extend from 1960 to 2014 and the World Health Organization reported international comparisons of a small number of countries in 1963 and 1967 (Abel-Smith, 1967), yet for many years most of these estimates were limited to higher-income nations. The 1993 World Bank Development Report *Investing in Health* (Musgrove, 1993) provided data on a much wider range of countries, as did the 1995 WHO World Health Report *Bridging the Gaps* (The World Health Report, 1995). WHO Health Statistics have been published annually since 2006 and now cover 194 countries. Procedures for producing such estimates have been formalized as *A System of National Health Accounts* (A System of Health Accounts, 2011).

3. THE CASE OF BRICS

Since early recognition of top performing emerging markets by Goldman Sachs back in 2001 (Building Better Global Economic BRICs, n.d), there has been a lot of debate on health care developments in BRICS nations (Brazil, Russia, India, China and South Africa). The sheer size of their populations and the pace of their economic development (Schrooten, 2011) make the internal developments in these nations echo around the world. It soon became recognized that these governments lifted hundreds of millions of people outside poverty over the past few decades (Watt *et al.*, 2013). Each of these five countries faced its own challenges to provide comprehensive health care to its citizens. Brazil's historical development of a national health system was visibly marked by its great ethnogeographic diversity and difficulties in providing access to medical care in rural areas. Ground breaking developments came in early 1990s with the establishment of the national health system

(Sistema Único de Saúde—SUS). Centuries long legacy of Russian Empire brought extensive universal health coverage gains only after the Revolution of 1917 with the formation of Semashko system in the early 1930s. Today, this country remains the only high-income one among the BRICS with significantly higher institutional capacities compared to the others. India as one of the World's most multifaceted societies is the hub of rapid growth in network of medical facilities in urban areas and four richest federal states. Elsewhere income gaps and affordability of medical care for the poor remain a long-term challenge. This is the only country in the group that has not succeeded to substantially increase its health care spending in terms of GDP share. China owns the most rapidly developing health system and presents the most significant member of the BRICS group in terms of global outreach. Its mammoth sized network of hospitals is largely funded by the revenues made on prescription medicines. Regardless of undisputed progress, medical technology innovation rate remains the core weakness. Gains in equity of access to medical care for the ordinary citizens living in rural areas are substantially higher compared to Brazil and India. South Africa is the flagship national health system of the Sub-Saharan Africa. After the difficult legacy of segregation and apartheid, it strives toward extending universal health coverage for its poor. Although smallest in terms of population size challenges faced by its health authorities shall be significant in the long run. Overall, bold gains in living standard and purchasing power of citizens gives momentum for all of the BRICS to increase investment in health care far more than majority of nations worldwide.

Coping strategies were deeply rooted in their diverse historical legacies and health system management and funding traditions. Among the major challenges were accelerated population aging (Ogura and Jakovljevic, 2014), blossoming of prosperity diseases (Jakovljevic and Milovanovic, 2015) and massive rural–urban migration ultimately creating some of the world's first megacities (Velooso, n.d). National policy makers did their best to improve health outcomes. The successes are most visible in improved neonatal survival and extended longevity (Jakovljevic *et al.*, 2015). Ever increasing coverage of poor citizens living outside major industrial areas as well as provision of medical benefits to the unemployed and vulnerable were some of the landmark successes now present in all five economies (Marten *et al.*, 2014).

Historical traditions of real socialism in Russia (Popovich *et al.*, 2011) and China tended to see health care as consumption rather than as a productive branch of the economy (George and Manning, 1980). Large-scale investments in national health reforms in these two countries proved that lessons were learned. The impact of population health on societal economic productivity are now broadly recognized (Bhargava *et al.*, 2001). The three remaining countries each followed its own distinct pathway by embracing extensive health reforms which proved to be fruitful as well (Rao *et al.*, 2014).

4. BRICS' HEALTH SPENDING OVER THE PAST TWO DECADES

Attempts at international comparisons of health expenditure data in previous decades were heavily compromised by differing national accounting strategies and policies. Diversity of a scale was notable among traditional OECD free market economies. Ongoing professional debates in the 1980s led to establishment of the WHO National Health Accounts released in 1995. These data became publicly available and a source for scholarly inquiry with the launch of Global Health Expenditure database comprising 194 UN member countries (Global Health Expenditure Database, n.d). This coordinated international effort has achieved broad coverage of primary data and indicators for the vast majority of nations presented with annual values reported by the national authorities to WHO.

The latest WHO NHA official release provides insight into the BRICS nations' health expenditures over 19 years extending from 1995 to 2013. Analysis of these data either in nominal or purchasing power parity terms shows three distinct patterns (see Table I). One is a significant rise in percentage point share of Brazil, Russia, India, China and South Africa in global health spending (Jakovljevic, 2015a). Another is heavy domination of Chinese national spending which tends to gain momentum even more in recent years. The third

Table I. BRICS' historical total health expenditures (THE) stratification (WHO NHA data); 1995–2013

	THE per capita (current \$ PPP)		General government expenditure on health per capita (current \$PPP)		Private expenditure on health per capita (current \$PPP)		Out of pocket expenditure per capita (current \$PPP)	
	1995	2013	1995	2013	1995	2013	1995	2013
Per capita health spending								
Brazil	\$522	\$1454	\$225	\$701	\$298	\$753	\$202	\$435
Russia	\$301	\$1587	\$222	\$762	\$79	\$824	\$51	\$762
India	\$63	\$215	\$17	\$69	\$46	\$146	\$42	\$125
China	\$61	\$646	\$31	\$360	\$30	\$285	\$28	\$219
South Africa	\$478	\$1121	\$189	\$543	\$288	\$578	\$67	\$80
BRICS (M +/- SD)	\$285 +/- \$220	\$1004 +/- \$572	\$137 +/- \$104	\$487 +/- \$281	\$148 +/- \$133	\$517 +/- \$294	\$78 +/- \$71	\$324 +/- \$280
National health spending	THE (% GDP)		THE (million constant 2005 US\$)		THE (million current US\$)		THE (million current \$PPP)	
	1995	2013	1995	2013	1995	2013	1995	2013
Brazil	6.65	9.67	\$46 302	\$112 814	\$51 153	\$217 308	\$84 580	\$291 306
Russia	5.36	6.55	\$28 050	\$64 967	\$16 803	\$136 670	\$44 697	\$226 615
India	4.06	3.97	\$18 312	\$58 110	\$15 377	\$76 892	\$59 923	\$268 809
China	3.54	5.57	\$32 455	\$270 803	\$25 805	\$511 164	\$76 268	\$899 581
South Africa	7.42	8.93	\$13 244	\$28 000	\$11 217	\$31 320	\$19 800	\$59 175
BRICS (M +/- SD)	5.41 +/- 1.65	6.94 +/- 2.36	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*
BRICS Total	N/A**	N/A**	\$138 362	\$534 695	\$120 356	\$973 354	\$285 268	\$1 745 486
BRICS' joint Share of Global THE (%)	N/A**	N/A**	4.0%	9.6%	4.7%	13.2%	10.7%	20.2%

*N/A—not applicable; measure or indicator inappropriate because of representing average value for national level health spending among nations with extreme diversity in population size.

**N/A—not applicable; calculation of summary amount of percentage point share of national gross domestic product (GDP) conveys no meaningful measure.

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pattern is probably the most surprising one in terms of past few centuries of world economic history. It is increasing long-term trend in BRICS nations global health spending share relative to the trend exhibited by the leading industrial G7 nations (Jakovljevic, 2015b).

BRICS' internal policy shifts and ability to strengthen health care investment refer to per capita spending independent of population size (see Figure 1). In the early 1990s, Brazil was heading the group in terms of total per capita health expenditure. It lost momentum relative to Russia over the next 14 years. The same pattern is visible in general governmental, private and out-of-pocket spending. The long-term trend among all five nations is a significant rise of overall per capita health spending. National authorities clearly accepted progressive responsibility to financially support growing civil expectations for more expensive and innovative medical care. Nevertheless, the most concerning fact remains an exceptional rise in out of pocket spending in all of the observed health systems.

There are major differences among these five countries in their ability to increase investment in health not only in absolute terms but also as a share of gross domestic product. Four out of five nations gained momentum extending significantly their health devoted share of GDP: Brazil (+3%), China (+2%), South Africa (+1.5%) and Russia (+1.2%), in decreasing order of appearance (see Table I). India's health spending actually slightly contracted from 4.06 %GDP in 1995 to 3.97% in 2013. Recently, the Federal Government of India has further reduced its health budget by 20% for the financial year 2014–2015 (Cutting Health Expenditure in India, 2014). Negative effects of such policy are partially compensated for by strong gains in overall welfare

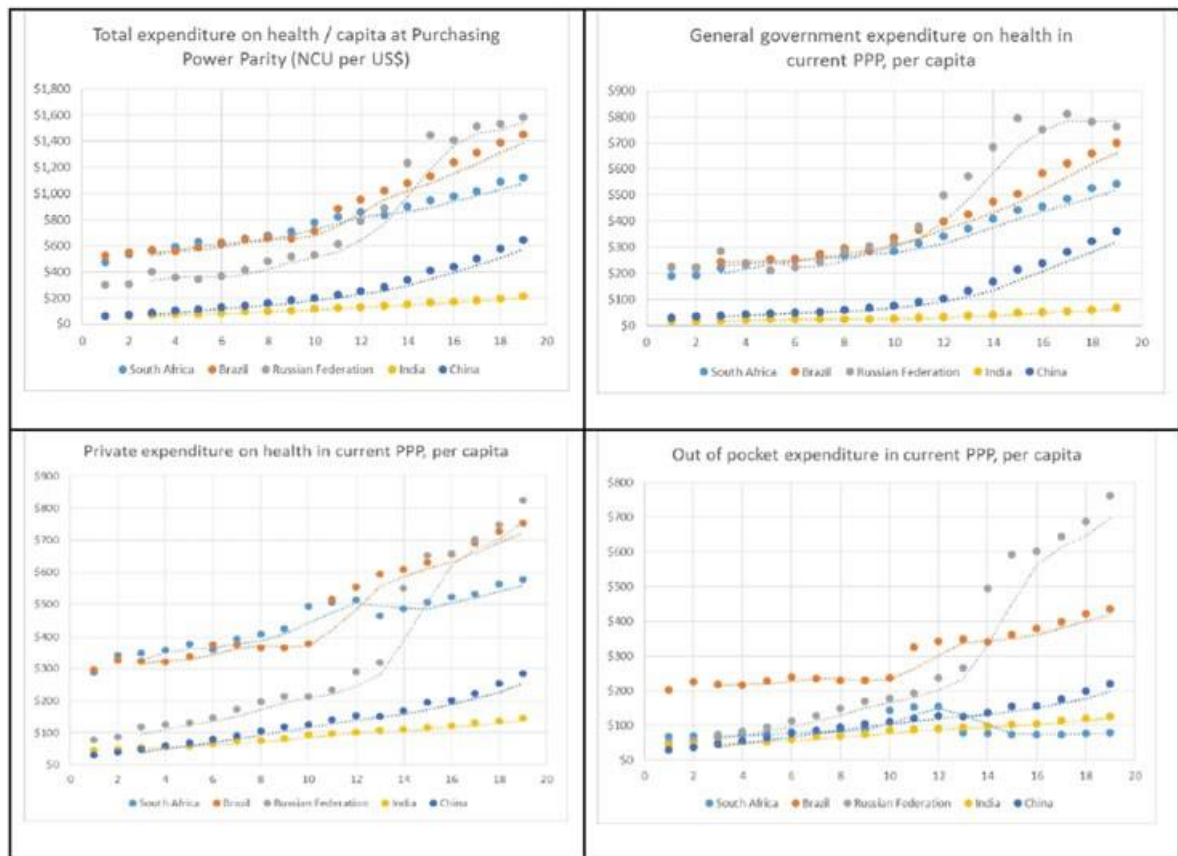


Figure 1. Total, generalgovernmental, out-of-pocketandprivatehealthexpenditurepercapita in BRICS nations 1995–2013 (current \$PPP international) three years moving average extrapolated (World Health Organization National Health Accounts Global Expenditure database, nd)

and income; hence, spending in absolute terms has recorded several fold gains. It is worth to mention that BRICS' mean health expenditure grew from 5.41 GDP% in 1995 to 6.94 GDP% in 2013.

5. PROJECTIONS OF NATIONAL HEALTH EXPENDITURES TO 2025

Forecasting methods developed for the USA and other OECD countries were applied to data from the BRICS economies to make the projections in Table II using a macroeconomic budgetary model in the form $GDP + X$ where 'X' is the excess growth rate of medical costs (Getzen, 2016). Macro budgetary models do not account for general equilibrium effects because they make use of external GDP forecasts, nor do they account for interactions and diversity among components such as payment sources, age, sex or illness categories, disease prevalence, hospital or physician supply, etc. (Lorenzoni *et al.*, 2015). However, in practice, such rudimentary budgetary models have proven to be more accurate than either general equilibrium or component models when making prospective forecasts of future total national health expenditures spanning more than five years (Getzen, 2015).

Current and projected expenditures for the USA and other high-income countries that account for about 40% of current global expenditures on health are also shown for comparison with the BRICS projections. Excess growth raising the share of GDP devoted to the health sector also plays an important role. Because there is considerable uncertainty regarding both of these factors, it is prudent to expect that national health expenditures may well be more than $\pm 15\%$ above or below the point estimates for 2025 shown in Table II. The complexity of health systems and the indistinct path of future economic development make it difficult or impossible to formulate projections that are more precise.

6. CHALLENGES TO EFFECTIVE INVESTMENT IN HEALTH CARE

Emerging markets such as the BRICS, Next Eleven and few other fastest developing economies present the peak of an iceberg of higher participation of low and middle income in world health spending (Jakovljevic and Getzen, 2016b). Signs of this phenomenon became visible over at least past thirty years. Most of top tier emerging countries belong to the so-called newly industrialized economies with notable exception of Russia with its strong industrial legacy of USSR. Nevertheless, internal societal tensions outsourcing from dynamic pace of development remain most typical among the BRICS. Part of this high tide of increased wealth is being

Table II. Projections of BRICS and the USA National Health Expenditures to 2025

	Historical		Projected		
	\$H 2012 PPP per capita	GDP share (%)	Excess growth rate	GDP share (%)	\$H 2025 per capita
India	\$196	3.8	1.0%	4.3	\$307
China	\$578	5.4	1.7%	7.0	\$1084
S. Africa	\$1091	8.9	0.9%	10.0	\$1413
Brazil	\$1388	9.5	0.8%	10.5	\$1844
Russia	\$1523	6.5	1.5%	8.0	\$2186
(<i>ex-USA</i>)					
<i>Hi income</i>	\$3062	9.8	1.5%	11.9	\$4627
USA	\$8845	17	1.2%	19.9	\$13 025
World	\$1173	8.6	1.5%	10.4	\$1795

Sources: WHO Statistics 2015 and author projections for 2025 (see note #).

Note#. The estimated real growth rates of per capita national income for each country are based on the averages for 1975–2010 as reported in the Maddison Project database, with an assumption of partial reversion toward the global mean. Estimated annual excess growth rates (percentage increase in health share of GDP) are based on the OECD Health Data 1975–2013 for high income countries, and on the WHO Health Statistics 2015 data for 2000–2012 for India, China, South Africa Brazil and Russia since earlier or more recent statistics are not readily available.

clearly transferred toward investment in health care (Jakovljevic, 2014). Some large nations like India struggle to increase their health spending in terms of GDP percentage (Barik and Desai, 2014). India and South Africa have a distinct advantage of younger populations being in earlier stage of demographic transition. Although population health indicators warn that extended longevity coupled with falling fertility rates are raising the portion of elderly in India as well. Nevertheless, this huge nation is about to experience demographic dividend of up to 150 million labor market expansion in the next few decades (King, 2012). Population aging in Russia continues to accelerate while China will clearly be the fastest aging large nation by 2050 (Dreaming with BRICs: The Path to 2050, 2003). This poses a serious risk to the financial sustainability of their large health sectors (Getzen, 1992). Possibly the single most significant challenge to the equitable and affordable provision of medical services in these countries are increasing income disparities among their citizens (Bloom and McIntyre, 1998) with partial exception of Brazil (de Marsillac MelsertII and BockII, 2015). Although the civil middle class and its purchasing power are rapidly growing, there is a deepening gap between rich elites and poor households mostly residing outside major urban cores in the rural countryside. An indicator of the seriousness of this issue is the constantly growing out of pocket expenses for health care that become a frequent cause of financial catastrophe for households (McIntyre *et al.*, 2006; Jakovljevic, 2016). Development of strategies designed to bridge this equity gap might be critical for the success of these health systems in the long run (Harris *et al.*, 2011).

Existing health care sectors in the BRICS economies may not be sufficient to meet rising population demand for medical services (Rodwin, 2015). The Russian Constitution guarantees (article 41) that all medical care provided in public facilities is free of charge covered by public financing. Outpatient medicines dispensing is omitted from this rule. Privileged vulnerable social groups make an exception from this rule. It means that most population needs for medical care could be met by public sector or complimented by public financed private providers (European Observatory on Health Systems, Policies, and Popovich, 2011). In most of BRICS countries local pharmaceutical markets tend to be dominated by generic instead of brand-name medicines (Jakovljevic *et al.*, 2016c). Nevertheless, because of local reimbursement policies, certain medicines, particularly cutting-edge innovative technologies remain largely unaffordable to the ordinary citizens (Popovich, 2013). Some weaknesses inherited from the past include the inefficiencies of large massive hospital sectors in curative based health systems. Eastern Europe was famous for its relative oversupply of physicians and higher availability of hospital bed capacities compared to the West (Jakovljevic, 2013). Such bed capacities tended to be under-occupied and generate excessive length of hospital stay after admission in some clinical areas. A partial exemption of this trend was the Russian tradition of authorities' regular check-ups of hospital utilization indicators such as bed occupancy rate and if it was too low the department could face closure (Atun *et al.*, 2005). More preventive public health- oriented system reforms have been attempted in all BRICS nations with diverse rates of success over the past three decades (Coovadia *et al.*, 2009).

Deep positive changes to replace outdated and malfunctioning health policies are taking place in all of these nations (Jakovljevic *et al.*, 2016). Whether the BRICS nations will continue to strive to improve universal and comprehensive health coverage in the long run shall be observed in the upcoming decades.

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