

## **THE DECENTRALISATION OF HEALTH MANAGEMENT SYSTEMS THROUGH SMALL AND MEDIUM ENTERPRISES IN BRIC-COUNTRIES: A SEMANTIC MODEL**

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### **ABSTRACT**

*This article has been developed to provide an analytical framework about the process of health decentralisation that has emerged in BRIC-countries. For this purpose, this study offers a reflection about the process of decentralisation in emerging BRICs (Brazil, Russia, India and China) with theoretical argumentative issues about public health systems, and the reorganisation of the public health sector. The following review consequently focuses upon the managerial aspects of health systems, and SMEs' contribution to services delivery. In accordance, a semantic model organises current key determinants of involved actors in the public health sector for a contribution to understanding the affirmation of multiple forms of development in which the delivery of healthcare services has been critically implemented.*

**Keywords:** BRICs, health care systems, public health management, SMEs

### **INTRODUCTION**

The affirmation of competitive environments in BRIC countries as Brazil, Russia, India and China, has marked a significant shift toward the formulation of economic decisional systems that address the enhancement of commercial exchanges – within and outside respective regional socio-economic capacities. Under the provision of international trading exchanges, these involved countries have acted for the increase of knowledge, and for the promotion of market relations. Potentially the increase of demand for the production of goods, the delivery of services, as well as, for the diffusion of technology information, has given confidence to societal partners investing in the sectoral development of national contexts.

The manifestation of significant governmental commitments has been to assess changes that have affected liberalised trading areas and reduce the practical obstacles that have emerged from the participation to internationalised economic exchanges which have increased very rapidly in recent years. Depending on each state's capabilities of BRIC, the increases of information flows, and the adaptation to raising demands for preferential growth patterns concerning the environment – with scientific or technical applications – have been articulated both tacitly and openly for a progressive integration within societies.

The mutual involvement into a learning process which has been shaped according to specific national characteristics has also required alternative directions for the transfer to people of mobile and interacting information channels, which have enabled a systematic knowledge development (Havlik, et al., 2009). The leading efforts of states' agencies, enterprises, and research institutions, among others – to drive their innovation activities for the application of cooperation frameworks at various locations – have particularly favoured international tendencies for the affirmation of specialised institutions putting knowledge information at the core of trade relations.

In substantial terms, the political and socio-economic environments of BRIC countries have allowed an intensification of standardised knowledge, as well as, production practices in competitive conditions, in order to integrate strategic economic policies for the generation of development initiatives across the regions. Moreover, the particular position of each country, in respect to the formulation of economic policies that have targeted market relations, has also been reflected in the fragmentation of national systems. Systematic formal relations have modified the status of the economy but at the same time have also created a certain level of disparity between the urban and rural areas, with consequential effects for enterprises operating within distinct administrative regions.

Pulling together a combination of historical, geographical, and socio-economic factors, it can be emphasised that communication systems have had a pivotal impact for approaching communities, and establishing integration linkages to meet with the rapid growth of commercial practices that have been adapted to national policy goals. In this sense, the increased presence of small and medium sized enterprises (SMEs) has been viewed as a significant signal for the possibility of modernising regional infrastructures, according to the desirability of changing environments associated with information and technology provision performances (Turner, 1997). In terms of a comparative review about the guiding principles of inter-connected BRIC which have marked newly reforming steps at institutional level for the improvement of public and private distribution of resources, a more comprehensive understanding about national contexts can also

contribute to determine specific aspects of economic development. For this purpose, we have decided to introduce, in the first part of this article, the process of health decentralisation in emerging BRIC with a research focus based on the health systems, and the reorganisation of the health sector. In the following sections, we review the managerial aspects of health systems, and SMEs' contribution to services delivery. Accordingly, a theoretical semantic model has been developed to organise current key determinants of involved actors in the health sector. Further gaps and limiting factors will also be discussed, with the inclusion of conclusive remarks about actual policy orientations, and research path foreseen for the health knowledge process.

### **THE PROCESS OF DECENTRALISATION IN EMERGING BRIC-COUNTRIES**

Firstly, the delocalisation of health services in decentralised areas of BRIC countries has been promoted by policy strategies in order to increase the accessibility of health delivery systems, and for budgetary purposes. In theory a type of administrative decentralisation in health can facilitate the inclusion of autonomous health bodies and favour, at the same time, a redistribution of functions by involving communitarian participation in terms of healthcare services.

In the same way, the decentralisation process holds accountable, for the efficient distribution of health services, regional decentralised bodies which can administer the financial resources at the local level (World Health Organisation (WHO)–SEARO, 2008). The efficiency and the adequacy of governmental forms of power distribution are already known in countries that have transitioned from collectivised economic distributions to liberalised marketing systems. In which the shape of political management both in democratic and in communitarian terms has had deeper implications for the public administration systems. The decisional scopes toward decentralised allocation of resources and responsibilities have been reflected in BRIC countries at different levels. In fact, the application of reforming logics can in effect bring at a higher-level economic and social activities' performance (Sedar, 2001). The search for stability to facilitate the process of distribution in regional governance through health agencies has necessarily conducted to the preparation of coping mechanisms that can also favour the delivery of public services by embodying responsiveness' behaviours in order to include a greater number of recipients, across Asian and Latin American societies.

These societies have quickly transitioned through massive reorganisation of public schemes with the inclusion of several factors related to developmental

conditions and legal practices, which have in effect been influencing the decentralisation of functions. Accordingly, the direction of public policies has been oriented towards institutional changes that can address the challenges of upgrading the distribution models for public services, also by including larger portions of people that had often been passive recipients.

In comparison to developed countries, the evolvement of structural conditions in BRICs has offered a composition of systematic variable contexts, where states have constructed their policies through public reforms for an efficient delivery of public services (Lavalle, 2008). The differential impact of transfer of public functions in states like India, or Brazil, has been perceived as an organic and inevitable process for the better management of local agencies, and for the correspondence of responsibility able to adapt to reforming guidelines established by national Ministerial Health authorities.

For this reason, on the one hand, the local administrations of public federations have had the opportunity to structure the delivery of healthcare services through an empowerment of functions that has allowed operational decision-making of health activities decentralised in nature. On the other hand, the participation of different social categories involved with medical services has been difficult to estimate from the point of view of users and supervising bodies. In this field, a key question about who's doing what in local health for public service distribution, and at what level, can be quite central to actually explain the past and current crisis that have occurred within bureaucratic systems of BRICs, despite public organisational choices for reform. In addition, the promotion of decentralised health plans, for instance, through national and regional economic agreements in individual countries has been pursued to increase comparative advantages in respective national contexts. This is also related to the liberalisation of trade exchanges, and the formation of preferential market areas across these regions (ASEAN, AFTA, *Mercosur*), which have formed competing attitudes expressed in development strategies when undertaken both socially and economically.

This situation has created the affirmation of multiple forms of development in which the delivery of healthcare services can be understood both in positive and negative trends. In fact, the implementation of decentralised local governance since the 1990s, reflects the mutation of political paths to build up supportive popular channels toward a common national framework like in China, ruled by the Chinese Communist Party (CCP), where the coexistence of provincial, municipal and local centres has enabled the country to distribute power responsibilities in a liberalised state market economy. In the same way, it has positioned itself as a prominent financial entity, where major cities have

effectively gained from strategic development choices, while rural provinces instead have seen an increase of inequality patterns in service distribution.

Similarly, the Russian Federation has proceeded through a transition period with a delocalisation of resources by undertaking a political development that has been marked by direct consequences for its population. This was in part due to an increase of inequality levels in socio-economic terms through which there had also been a decline in the delivery of healthcare services (Galbraith, Krytynskaia, & Wang, 2004). In essence, the association of a deregularisation of duties has brought important economic changes that have created the existence of parallel dimensions in the management of public resources, with some contrasting effects related to social and health delivery sectors as well.

The alternance of structural conditions in India and Brazil, since the 1980s, has been driven by institutional confrontations for market liberalisation, and by the admittance of multiple economic actors for service provision, through which healthcare systems have been rationalised for the decentralisation of public agencies, and health service distribution. When we look at improvements of health delivery systems in BRIC, there are studies (Eggleston, Ling, Qingyue, Lindelow, & Wagstaff, 2008) that emphasise major differences for the organisation of social and health care services at the national, subnational and local level, because of different regulations that have been passed during previous decades about for the managerial aspects of health service expansions. These aspects have also created inequality treatments for particular segments of the population that has been excluded from health care services, depending on the location (urban or rural), and on affordability of health costs.

In addition, the integration of health policies aiming at the distribution of primary health care in order to reduce the risks of epidemics, and restructure the configuration of management about health responsibilities has varied from country to country. These countries under transitioning cycles of political, economic, and social life have been interested by progressive approaches able to form appropriate organisational and technological improvements, with the innovation of health care delivery and the decentralisation of public functions in new market environments (Rozenfeld, 1996). However, due to the presence of economic crisis, national budgetary plans have been reduced, and further investments on most medical facilities have been retraced by lowering the quality of health care systems. Where larger numbers of social partners have become particularly involved with voluntary health insurance schemes, obligatory health insurance for all, and out of pocket payments for health services. More discussions about these involved aspects will follow in the next part.

## **REORGANISING THE HEALTH SECTOR**

When we devote our attention over the institutional dynamics in the health sector, more deliberate understanding can allow seeing active roles that have been played within stratified segments of societies across BRIC. In particular, the development of national guiding principles has been put into practice for the effective organisational delivery of services, and for the predisposition of control mechanisms with a better coordination of this action-driven process.

A broader view on this subject may reveal how industrialised central hubs have obtained different enforcements of strategic health and planning policies. Whereas rural provincial hubs have launched autonomous initiatives to improve health care services while being exposed to an inter-regional inequality about compensatory financial schemes for health. In the case of China, the promotion of laissez-faire policies has favoured changes of formal state frameworks for the enhancement of structural capacities where local governmental bodies had to facilitate an industrial production at the local level. In this regard, it has been pointed out that "case studies seem to suggest that rising local state power [...] created incentives for local cadres to be responsive to peasants' welfare demands." (Huang, 2004, 374).

However, state funding programs for health services through public implementation policies have not yet fulfilled an empowerment process of local governance units. Local units in Chinese rural provinces have been central actors in a national reform process destined to support public health awareness, while setting additional health standards. In effect, the local populations have assisted to forms of payments quite decentralized in nature through which cost and reimbursement methods could meet the maintenance costs of health care services (see Figure 1 for urban/rural insurance coverage percentage) (Ma, Lu, & Quan, 2008).

In the same way, public policies oriented for profitable revenues in the health sector, have also established a series of service fees for the use of specific typologies of health needs (Tables 1, 2 for public/private health expenditure), and for the privatisation of hospitals owned by the private sector, as reported: "In 2004 there were 2,545 private for profit hospitals, accounting for 13.8% of all hospitals in China, and 145,375 private for profit clinics accounting for 72.0% of all clinics." (Ma et al., 2008, 940). As a reverse effect, the virtual gap between urban and rural areas for health care programs has increased in terms of local health services, at the detriment of societal categories that cannot enter basic health facilities for the out-of-pocket fees' payments, and for other affordability difficulties that have deteriorated in recent years (Liu, Rao, Wu, & Gakidou, 2008).

Table 1  
Health expenditure

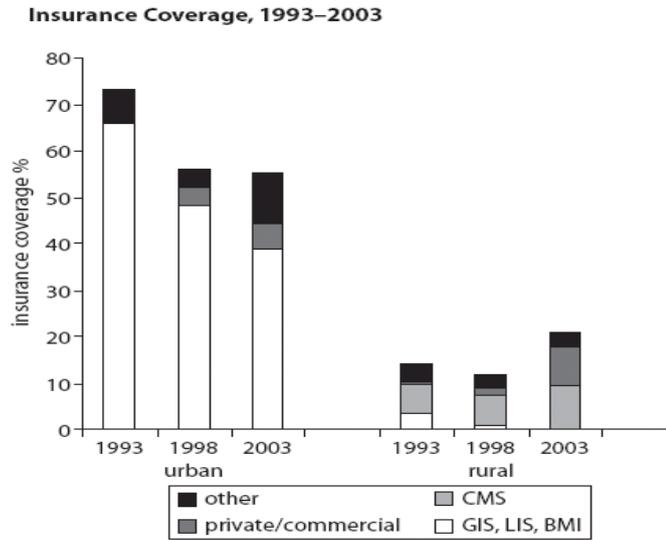
Location	Time period	Private expenditure on health as a percentage of total expenditure on health	General government expenditure on health as a percentage of total expenditure on health	Total expenditure on health as a percentage of gross domestic product
Brazil	2009	54.3	45.7	9.0
	2008	56.0	44.0	8.4
	2007	58.4	41.6	8.4
	2006	58.3	41.7	8.5
	2005	59.9	40.1	8.2
Russian Federation	2009	35.6	64.4	5.4
	2008	35.7	64.3	4.8
	2007	35.8	64.2	5.4
	2006	36.8	63.2	5.3
	2005	38.0	62.0	5.2
India	2009	67.2	32.8	4.2
	2008	67.6	32.4	4.2
	2007	70.4	29.6	4.1
	2006	72.5	27.5	4.1
	2005	77.0	23.0	4.0
China	2009	49.9	50.1	4.6
	2008	52.7	47.3	4.3
	2007	54.7	45.3	4.2
	2006	59.3	40.7	4.6
	2005	61.2	38.8	4.7

Sources: WHO databases ([http://apps.who.int/gho/indicatorregistry/App\\_Main/](http://apps.who.int/gho/indicatorregistry/App_Main/))

Table 2  
General health expenditure

Location	Time period	Social security expenditure on health as a percentage of general government expenditure on health	Out-of-pocket expenditure as a percentage of private expenditure on health	Private prepaid plans as a percentage of private expenditure on health	General government expenditure on health as a percentage of total government expenditure
Brazil	2009	0	57.1	41.2	6.1
	2008	0	57.1	41.2	6.0
	2007	0	58.8	39.4	5.4
	2006	0	62.4	35.8	5.1
	2005	0	63.0	35.3	4.7
Russian Federation	2009	38.7	80.9	11.0	8.5
	2008	38.7	81.3	10.6	9.2
	2007	38.7	83.0	9.6	10.2
	2006	42.3	81.5	10.2	10.8
	2005	42.0	82.4	8.2	11.7
India	2009	15.9	74.4	2.3	4.1
	2008	17.2	74.4	2.3	4.4
	2007	19.3	75.9	2.2	4.1
	2006	22.0	82.6	2.2	3.9
	2005	28.8	87.9	2.1	3.2
China	2009	66.3	82.6	6.2	10.3
	2008	66.3	82.6	6.2	10.3
	2007	66.3	82.6	6.2	10.3
	2006	57.3	83.1	6.5	9.9
	2005	54.1	85.3	5.8	9.9

Sources: WHO databases ([http://apps.who.int/gho/indicatorregistry/App\\_Main/](http://apps.who.int/gho/indicatorregistry/App_Main/))



Note: CMS = Cooperative Medical Scheme; GIS = Government Insurance Scheme; LIS = Labour Insurance Scheme; BMI = Basic Medical Insurance.

Figure 1. Insurance coverage in China (1993–2003) (Source: World Bank, 2009)

Further analysis on health care performance in China seems to confirm the limited accessibility of vulnerable sectors to the provision of health services, where it can be highlighted the fact that low income groups have been more exposed to public users' fee, while middle income groups have utilised private sector health provisions (Jiang, Gan, Kao, Zhang, Zhang, & Cai, 2009). From national health country programs, despite structural reforms "the regular budget has traditionally been distributed by the Ministry of Health (MoH) without the benefit of a comprehensive strategic framework, expected results and indicators, or a critical assessment of funding proposals. Funds have been allocated to a variety of institutes that do not always use the funds in a coordinated way or address national health priorities" (WHO, China, 2004, 16). In a way we can underline that the actual mechanisms of health systems do cross bordering knowledge areas in which strategic policies also need to include combined factors related to health information systems and surveillance, monitoring and evaluation, training and financing, among other aspects, at the global level (WHO, China, 2004). The delivery capacity of fragmented health systems requires organisational choices that can allow the flow of functional capacities (e.g. in hospitals) where similar duties may be repeated, in time and space, by creating a lack of coordination of multiple channels, both public and private, with a negative impact between different regions (Eggleston et al., 2008).

## **Brief Overview of Russian Federation, Brazil, and India, Public Health Reforms**

The Russian health care reforms have been emerging in a transition system in which certain inadequacies of distribution services have tended to form an inefficient use of available resources. The allocation of economic resources to cover the costs of the health sector has been poorly managed, despite the fact that the nation has favoured the development of structural reforms, in order to increase the health standards of the Federation. The status of the systemic provision of social and health services has passed from a centralised and vertical administration, to a decentralised functional distribution, where privatised services have been encouraged to meet the needs of the entire population.

Since the 1990s, the country's authoritative democratic bodies have in principle sponsored a free provision of health services to all, but in correspondence to an empowerment process for a market economy transition. The application of an insurance-based system established by the national legislation, in the same decade, reaffirmed the reforming steps of a health system that could actually ensure to its citizens' access to guaranteed delivery of health care services, with no adding charges. For this purpose, it was prepared a so-called Federal Fund of Mandatory Medical Insurance (FFOMS) allowing the regional population in Russia to choose between competing actors for medical insurance companies with an efficient distribution of medical activities (Organisation for Economic Cooperation and Development (OECD), 2006).

For financial constraining cycles, the competing health system that was designed to give a liberal insurance choice to the users of health facilities resulted instead in a partial reformed process for the fact of reducing the access to healthcare facilities also because as pointed out "insurance companies themselves [have] failed to develop as active, informed purchasers of healthcare services. Most are passive intermediaries, making money by simply channelling funds from OMS [...] to claim reimbursement of administration costs." (OECD, 2006, 193). Essentially, the promotion of a decentralised health system based on the insurance system has been administered by the Federal Ministry of Health Care through recognized medical institutions that are compatible with standardised financial and administrative procedures (Shishkin, 1998).

Medical providers, at the regional and local level, have been operating within a rational and functional design scheme that has distributed health care services in a vertical way. At the same time, distinctive health bodies have also been in charge of performing duties within the technical boundaries of federal, regional and local administrations. The problems that have emerged with the introduction of health insurance providers have been related to the transformation of

integrative financial models that could in theory support the mandatory application of insurance schemes, which however, in practice could not be systematically applied to the functional evolution of specialised health agencies. As a result, the lack of integration between medical providers, health administration bodies, and health insurance funds, has produced competitive behaviours not only across the country, but also within regions. In this respect, the health indicators of the Russian population have been declining, also because of an inefficient employment of resources where national studies have indicated that:

- (a) the level of individual health tends to decline steadily;
- (b) each succeeding generation's health potential is going down;
- (c) there is an ongoing, unnatural situation in which health problems shift from the aged to children and young people; [...]

(Rimashevskaja & Korkhova, 2004, p. 9)

In particular, protection mechanisms for the reduction of child mortality rates have reached a point of crisis for the fact that a deterioration of health facilities in state's health centres or in hospitals - in terms of equipments and a lack of manpower - still remains intertwined with funding systems, and with levels of survival of low-income population (Parfitt, 2005). For example, the rates of infant mortality (Table 3), as shown below, depend on a variety of medical but also non-medical factors that have been related to social conditions of the mothers, lifestyles and attitudes, but also to specific country health systems with coping mechanisms diffused in health sectors (OECD, 2010).

Therefore, the national reform of the health system in Russia has been a critical issue for the involvement of governmental health actors that have been polarised around separated development strategies. Through the implementation of national legislations, health care service delivery has been put in place by reformed federal and ministerial authorities that have been in charge of functional devolutions, and control mechanisms for the effective management of the health systems in liberal economies (Danishevski & McKee, 2005). Unfortunately, the expected effects of an inter-regional cooperation activity leading to the decentralisation of functions, in the health system, have been limited by lowering the quality of health services under unsettled conditions.

Table 3  
*Infant mortality rates*

Major area, region, country or area *	Infant mortality rate, q(1), for both sexes combined (infant deaths per 1000 live births)						
	1975– 1980	1980– 1985	1985– 1990	1990– 1995	1995– 2000	2000– 2005	2005– 2010
<b>Eastern Asia</b>	39	35	32	28	26	23	20
China	42	38	34	30	27	25	22
Japan	9	7	5	4	4	3	3
Mongolia	104	102	92	67	55	44	36
Republic of Korea	33	25	15	10	7	5	4
<b>Southern Asia</b>	111	99	88	80	72	64	56
Afghanistan	195	183	172	162	152	144	136
Bangladesh	138	122	104	91	74	59	49
India	106	95	85	76	69	61	53
Nepal	139	123	107	92	72	55	39
Pakistan	107	101	97	90	83	77	71
Sri Lanka	39	30	24	22	19	16	12
<b>South America</b>	71	57	47	38	31	25	21
Argentina	39	32	27	24	22	15	13
Brazil	79	63	52	43	34	27	23
Chile	45	24	18	14	11	8	7
Colombia	57	43	35	28	24	20	19
Ecuador	82	68	56	44	33	25	21
Peru	99	82	68	48	39	30	21
Uruguay	42	33	23	20	16	14	13
<b>EUROPE</b>	22	18	16	13	10	9	7
<b>Eastern Europe</b>	27	23	21	19	17	14	10
Bulgaria	22	18	14	15	15	13	10
Czech Republic	18	15	11	8	5	4	3
Hungary	26	20	17	13	9	7	6
Poland	23	20	17	16	10	7	6
Republic of Moldova	46	35	31	29	24	19	16
Romania	31	26	26	23	21	17	14
Russian Federation	30	26	24	22	21	17	11
Ukraine	23	20	18	17	17	13	13

Source: United Nations (2011).

In the case of *India's* health reform plans, the National Health Policy in 2002 drafted by the government recognised the fact that the availability of health infrastructures had been quite insufficient for the provision of health care facilities that had to be extended according to increasing needs in public health (WHO, 2006). In order to cover the national health financing costs, the country utilizes both public and private funds, in particular: "India spends 4.6% of its GDP on health, of this 0.9% is public expenditure and 3.5% is private expenditure" (WHO, 2006, 11). Overall, the country has maintained private health insurance schemes, as well as, out of pocket payments to sustain health treatments' costs. In addition, the presence of external funding organisations has contributed to the support of health systems. In which a sense of inequity has run deep across regional states for the structural imbalances that have rendered the population chronically exposed to poverty and malnutrition problems. In cooperation with international partners, specific states have created multiple projects toward the strengthening of health service provisions, as the Official Development Assistance (ODA) for example; Tables 4 and 5 show annual health assistance expenditure.

Table 4  
*Health assistance*

<b>Official Development Assistance (ODA) for Health - (million, constant US\$)</b>								
<b>Commitments to recipient countries - Amounts per capita year (million US\$)</b>								
<b>Countries</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Brazil	0,10	0,18	0,18	0,17	0,14	0,12	0,12	0,16
India	0,46	0,33	0,45	0,52	0,90	1,24	1,25	0,90
China	0,10	0,12	0,21	0,20	0,23	0,18	0,18	0,26

**Sources:** (Country cooperation strategy 2011, in WHO, 2006); Data source: OECD DAC/Statistics

Health national and regional agencies for decision-policy making activities have done drastic interventions to improve the disease controls across states, and to enhance the quality health standards. For these purposes, a number of different actors have been autonomously involved, at the public and private level, to operationalise health provision functions both in terms of funding agencies, and health delivery services. At the same time, official policies such as the Population Policy 2000, Health Policy 2002, Science and Technology Policy, 2003, have explicitly reaffirmed a national interest for health research and development, through the implementation of coordination mechanisms for the affirmation of strategic aims about the health reform process conceived in India (Indian Council of Medical Research (ICMR), 2007).

Table 5  
*Health assistance by purposes*

<b>Official Development Assistance (ODA) for Health - (million, constant US\$)</b>					
<b>Commitments to recipient countries - Breakdown by purpose year</b>					
<b>Names</b>	<b>Commitments to countries (million US\$)</b>	<b>Purpose of ODA for Health (million US\$)</b>			
		<b>Unspecified</b>	<b>MDG6</b>	<b>Other health purposes</b>	<b>RH &amp; FP</b>
Brazil	30,27	2,48	22,66	4,54	0,58
India	1052,00	90,94	519,60	241,26	200,20
China	345,89	17,92	258,99	64,79	4,19

**Sources:** (Country cooperation strategy 2011, in WHO, 2006); Data source: OECD DAC/Statistics

A changing model about economic development status has also similarly interested the *Brazilian State*. Since the 1980s and the 1990s, an inclusion of liberal reforms acted for the promotion of unrestrained markets, and unrestricted regulations. In terms of reforms in health systems, the country has structurally brought internal significant changes, also through the Unified Health System – *Sistema Único de Salud (SUS)* - together with a private funded system – Supplementary Private Systems (SPS). In particular, the application of SUS system has favoured a decentralised delivery of medical services by transferring both responsibilities and resources to governmental agencies at the local level (Collins, Araujo, & Barbosa, 2000). For the democratic character of the SUS program, it supports a universal access to health care for all by decentralising technical and financial functions to municipalities and in cooperation with the federal government. Of main interest, it is also the aspect of control agencies named - *Agência Nacional de Vigilância Sanitária (ANVISA)*—the National Health Surveillance Agency, and *Agência Nacional de Salud (ANS)* the Health Agency for Supplementary Health, that have been both in charge of controlling the production and distribution of health products (e.g., pharmaceutical), together with the regulation of private healthcare in preservation of the public interest (Chamas, 2005).

Whereas, at the municipal level, the establishment of the Municipal Health Fund has been administered by local authorities under a certain degree of independence for the health funds' distribution policies. As confirmation of decentralised payment schemes in public health, it has been stressed out how "[...] Brazil went through a progressive process of financing decentralisation. Federal government participation in the public health financing was reduced from 73% to 54%, while the municipalities' share increased from 9% to 18% between 1985 and 1996" (Medici, 2002, 5).

From national health directives, the Ministry of Health has continued to reinforce the decentralization of functions of internal states by means of regulation, and coordination mechanisms in order to develop a financial sustainability of health delivery of services. Nevertheless, the fragmentation of the health system within a basic SUS structure, has presented mounting obstacles for the volume of health care services according to population size, and for the increasing costs in health. As observed, "Brazil still has 2 health systems: the SUS operates throughout the country, its 475,699 health professionals attending to the health needs of Brazil's 174.6 million people in 5714 hospitals with 439,577 hospital beds and in 62,865 ambulatory care centres (Elias & Cohn, 2003, 46)." In this context, the national demand for health care services has been limited due to a reduced number of health centres and medical providers. For this condition, the Brazilian health sector has been progressing toward collaboration for health provision between the public and private sector, with greater emphasis also been put on research and development for innovation in bio-tech products to strengthen the country's capacity in health systems (Rezaie, et al., 2008).

## **THE CONTINUITY OF HEALTH SYSTEMS**

Understanding the composition of independent BRIC-countries that have naturally adapted to the changing nature of contemporary economic relations, it can also involve a continuous knowledge about the evolution of semi-industrial models that has led to a complex structural process - in which the visible lines between public and private interests have regularly been shifted to different types of health systems - but until what extent? Given to the fact that the population in Brazil, Russia, India, and China has a very high density, large size, and geographical concentration, with a considerable degree of variation in terms of internal population movements, the question is to know how states' connecting networks having substantially increased healthcare services locally, especially primary health, have also been able to continue in recent years the expansion of health systems within market economies.

As described before, policymakers in BRIC have mostly focused on reforms for the delivery of health services by providing universal coverage of health for 'all,' in order to meet with the growing expectations of societies which have transitioned toward socioeconomic environments, globally convergent on profitable liberal policies. For this reason, putting health reforms institutionally in place for the possible achievement of health targets has also been promoted to raise the quality of health service delivery, with decentralized public measures that had to favour the management of local entities, in which participatory agents could handle the health reform process (WHO, 2008).

Nonetheless, the impact of protection policies for the enhancement of health systems has gone in parallel with exclusion responses that have created important inequalities in the accessibility of health services by lowering quality standards imposed directly on people. The problem of effectively meeting health demands' among BRICs has often depended on a reduced supply capacity of health systems that has been characterised by the fragmentation of health delivery services, within multi-cultural settings that have also been exposed to constraining financial aspects.

From this type of picture, it becomes easier to see, on the one side, the repetition of public health governance plans that have centred health policies for better connection of health systems. The involvement of comprehensive domestic environments, in particular, with civil society actors, health authorities, and investment firms, has been built up for a sustainable continuity of health care provision in high income and low-income countries.

On the other side, the changing requirements of health systems in BRIC have dealt with marginalisation and inequality distribution towards community members that has been caused by critical motives which go beyond the health sector *per se*. However, the establishment of a transparent and continuous mutual process has involved social organisations (as for Brazil) which have acted through the adoption of flexible managerial models about public resources for an increase of accountable behaviours at the governmental level.

This increase of a transparent flow of management functions given to different entities has granted a greater autonomy, and higher responsibilities for the public governance while also involving a social participation for the extension of relations between the state and the civil society (Sano & Abrucio, 2008). For the essential preparation of responsibility mechanisms within adaptable forms of public governance, nowadays, this process should especially favour a direct participation of citizens by opening to dialogue patterns with respective ruling actors for the operational dimension of public policies in Brazil, but also in other countries.

The reform process of the health sector in China, for instance, has created respective forms of obligations and choices among different actors oriented toward a reduction of public spending in the rural health sector, in particular. Essentially, within the economic transition experienced by the country during last decades, the health rural programs have not been formalised as central objectives for the country's overall growth plans. Moreover for decentralised areas it has been pointed out that "there was no alternative fiscal transfer from higher levels. But the exact responsibilities in terms of spending [...] have been a constant subject of contestation in transitional China, and the health sector has particularly

suffered from this state of affairs (Meessen & Bloom, 2007, 222)." Again the devolution of central authorities to local administrative leaders in China has been strategically oriented for increasing power capacity for the promotion of trade relations, however in disconnection with societal rural health needs for the long-term period.

Comparatively, the operational modalities of the Indian health systems have included state-owned and private-owned facilities sponsored by financing institutions that have periodically organised project innovation activities, in order to expand the access of health care services. In reality, major problems also associated with technical barriers, have constrained the effects of public policies, legal frameworks, entrepreneurship's initiatives, together with the managerial diversification of enterprises that has been focused on the improvement of health infrastructures. Emerging regional inequalities have stimulated, in particular, international partnerships for short-term national health plans which have been regulating, among other elements, the "reorganisation and restructuring of the existing health infrastructure at primary, secondary, and tertiary levels [...]; a delegation of power to Panchayat Raj institutions to ensure local accountability of public health care providers; [...] development of an appropriate two-way referral system using information technology [...]; clear definition of the role of the various stakeholders – the government, private and voluntary sector" (WHO, 2006, WHO Country Cooperation Strategy 2006-2011, 14). In addition to this, in association with developmental stages related to new technologies, the country has been offering commercial spaces in the health sector for the increase of high-quality healthcare facilities in regional states that have also favoured the participation of private players from large and small enterprises, under national capacity's health plans that have been implementing this coexistence of regional systems across India (Gottumukkala, 2009).

From the Russian Federation's part, it has followed the reform process by approaching the reorganisation of health services management that has deeply characterised the quality of health care provision since the 1990s, with increasingly declining rates of life expectancy for the population, for example. Moreover, the overlapping functions of economic planners, decision-making actors, and respective health management agencies, have created the conditions for a multiplication of health initiatives, which however have been unable to meet the delivery of quality services, and the protection of health service users (Tragakes & Lessof, 2003).

For instance, among the Russian Federal laws adopted during reforms in 1991, as highlighted: "on health insurance of the citizens [...] No. 1499-1, set [ting] out the basic framework for the establishment of a health insurance system for publicly provided health care services. This law was considered to have some

fundamental weaknesses: it did not provide an appropriate institutional framework, it did not comply with the tradition of solidarity, and it involved the use of risk-based insurance. [...] It was accepted as the basis of the health insurance system" (Tragakes & Lessof, 2003, 171). The resulting health policy initiatives have been addressed by national authorities for decentralised interventions in the administration. In order to improve the effectiveness of health systems within industrialised environments that intended to stimulate the development of local capacities through health and social protection norms, the state has balanced this development with contradictory effects for the transition in health care reform.

Overall, the newly developed economies of BRIC-countries have differed in the affirmation of potential innovation elements of health care distribution, where emerging challenges have been separately tackled also based on inner resources, international cooperation programs, and level of transfer of health knowledge for innovation - including health services delivery at the local level - in the interest of short-term and long-term public policies. Statistics data reported in (Tables 6, 7, 8, 9, and Figures 2, 3, 4, 5) for financial spending in health per country shows the temporal discrepancy among spending countries.

Table 6  
Brazil health spending

Country	Year	Donor spending on health as % of total health spending—WHO	Government expenditure on health as % of total government expenditure—WHO	Out-of-pocket expenditure as % of private expenditure on health-WHO	Out-of-pocket expenditure as % of total expenditure on health-WHO	Per capita total expenditure on health at average exchange rate (US\$)-WHO	Private expenditure on health as % of total expenditure on health-WHO	Public (government) spending on health as % of total health expenditure-WHO	Total expenditure on health as % of GDP-WHO
Brazil	1995	0.2	8.4	68	—	317	57	43	6.7
Brazil	1996	0.1	8.1	68.6	—	351	59.5	40.5	6.8
Brazil	1997	0.2	7	66.9	—	356	57	43	6.8
Brazil	1998	0.3	5.6	66.9	—	336	57.4	42.6	6.7
Brazil	1999	0.5	5.5	67.1	—	242	57.3	42.7	7.1
Brazil	2000	0.5	5.5	62.7	—	267	60	40	7.2
Brazil	2001	0.5	6.6	58.1	34.57	237	59.5	40.5	7.6
Brazil	2002	0.4	7	56	32.54	216	58.1	41.9	7.7
Brazil	2003	0.1	6.1	55.2	32.4	229	58.7	41.3	7.5
Brazil	2004		7.2	53.9	30.56	279	56.7	43.3	7.7
Brazil	2005		6.7	54.6	30.52	371	55.9	44.1	7.9
Brazil	2006	0.1	7.2	64	33.34	426	52.1	47.9	7.5

Sources: Health Systems 20/20 ([www.healthsystems2020.com/](http://www.healthsystems2020.com/))

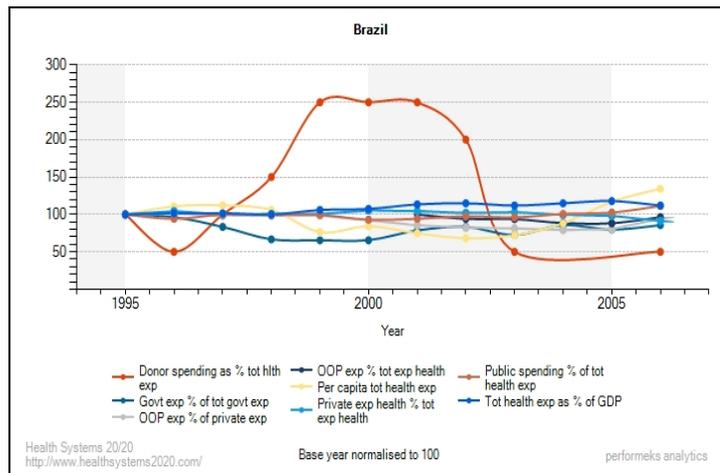


Figure 2. Brazil health trends (Health Systems 20/20, [www.healthsystems2020.com/](http://www.healthsystems2020.com/))

Table 7  
Russia health spending

Country	Year	Donor spending on health as % of total health spending- WHO	Government expenditure on health as % of total government expenditure- WHO	Out-of-pocket expenditure as % of private expenditure on health- WHO	Out-of-pocket expenditure as % of total expenditure on health- WHO	Per capita total expenditure on health at average exchange rate (US\$)-WHO	Private expenditure on health as % of total expenditure on health- WHO	Public (government) spending on health as % of total health expenditure- WHO	Total expenditure on health as % of GDP- WHO
Russia	1995	0.1	9	55.2	-	118	29.3	70.7	5.6
Russia	1996	0.5	8.7	54.2	-	153	31.8	68.2	5.8
Russia	1997	0.4	10.5	55.5	-	200	31.5	68.5	7.3
Russia	1998	0.6	9.6	62.3	-	123	36.2	63.8	6.8
Russia	1999	0.8	9.3	74.1	-	75	37.5	62.5	5.7
Russia	2000	0.2	9.6	74.7	-	95	40.1	59.9	5.4
Russia	2001	0.2	9.6	73.7	30.44	118	41.3	58.7	5.7
Russia	2002	0.2	9.5	75.2	30.83	141	41	59	6
Russia	2003	0.2	9.4	79.7	32.84	166	41.2	58.8	5.6
Russia	2004	0.1	9.7	82.2	33.21	212	40.4	59.6	5.2
Russia	2005	0.1	10.1	82.4	31.31	277	38	62	5.2
Russia	2006	0.1	10.8	81.5	29.99	369	36.8	63.2	5.3

Sources: Health Systems 20/20 ([www.healthsystems2020.com/](http://www.healthsystems2020.com/))

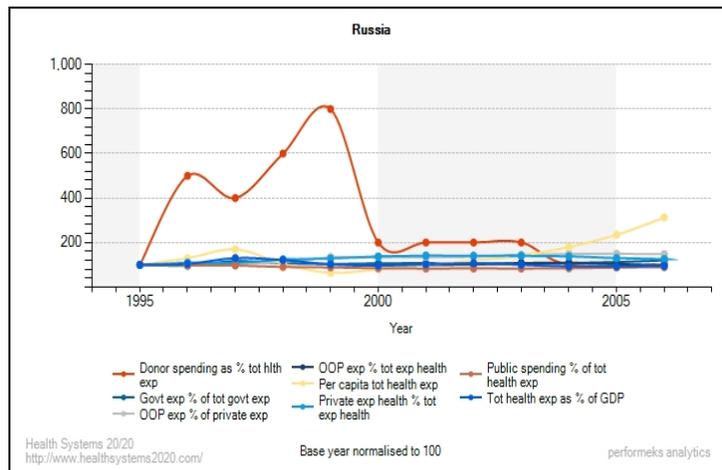


Figure 3. Russia health trends (Health Systems 20/20, [www.healthsystems2020.com/](http://www.healthsystems2020.com/))

Table 8  
India health spending

Country	Year	Donor spending on health as % of total health spending-WHO	Government expenditure on health as % of total government expenditure-WHO	Out-of-pocket expenditure as % of private expenditure on health-WHO	Out-of-pocket expenditure as % of total expenditure on health-WHO	Per capita total expenditure on health at average exchange rate (US\$)-WHO	Private expenditure on health as % of total expenditure on health-WHO	Public (government) spending on health as % of total health expenditure-WHO	Total expenditure on health as % of GDP-WHO
India	1995	1.3	4.3	91.3	-	16	73.7	26.3	4.1
India	1996	0.2	4.2	90.9	-	16	74.1	25.9	4
India	1997	1.6	4.3	91.9	-	18	75.2	24.8	4.3
India	1998	1.7	3.8	91.8	-	18	76.6	23.4	4.3
India	1999	1.3	3.5	91.3	-	18	76.1	23.9	4
India	2000	0.6	3.4	92.1	-	19	77.8	22.2	4.3
India	2001	2.4	3.3	92.6	73.62	21	79.5	20.5	4.6
India	2002	0.3	3.2	93.2	75.4	22	80.9	19.1	4.8
India	2003	0.6	3.1	93.5	76.2	26	81.5	18.5	4.8
India	2004	0.5	3.1	93.8	77.2	30	82.3	17.7	4.9
India	2005	0.4	3.5	94	76.14	36	81	19	5
India	2006	0.7	3.4	94	75.58	39	80.4	19.6	4.9

Sources: Health Systems 20/20 ([www.healthsystems2020.com/](http://www.healthsystems2020.com/))

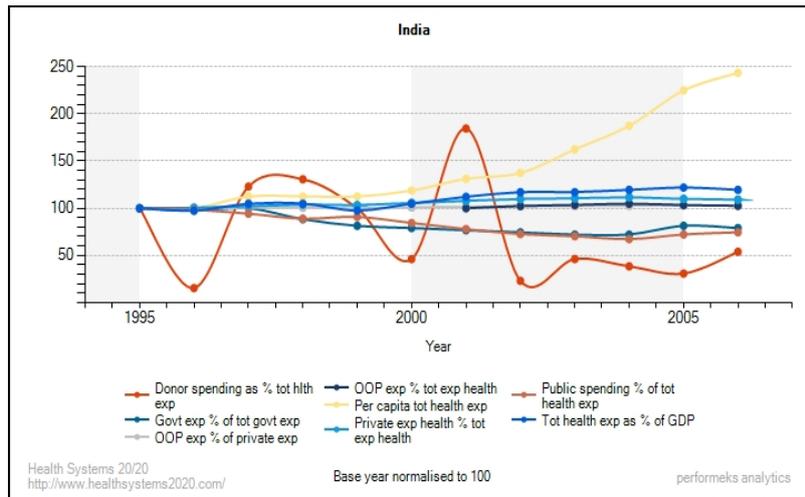


Figure 4. India health trends (Health Systems 20/20, [www.healthsystems2020.com/](http://www.healthsystems2020.com/))

Table 9  
China health spending

Country	Year	Donor spending on health as % of total health spending-WHO	Government expenditure on health as % of total government expenditure-WHO	Out-of-pocket expenditure as % of private expenditure on health-WHO	Out-of-pocket expenditure as % of total expenditure on health-WHO	Per capita total expenditure on health at average exchange rate (US\$)-WHO	Private expenditure on health as % of total expenditure on health-WHO	Public (government) spending on health as % of total health expenditure-WHO	Total expenditure on health as % of GDP-WHO
China	1995	0.2	15.9	93.7	—	21	49.5	50.5	3.5
China	1996	0.1	15.9	94.8	—	27	53.4	46.6	3.8
China	1997	0.1	15.3	94.8	—	31	55.8	44.2	4
China	1998	0.1	14.2	94.3	—	36	58.2	41.8	4.4
China	1999	0.1	12.5	94.5	—	39	59.1	40.9	4.5
China	2000	0.1	1.1	95.6	—	44	61.7	38.3	4.6
China	2001		.9	93.1	59.96	48	64.4	35.6	4.6
China	2002		.9	90	57.78	54	64.2	35.8	4.8
China	2003	0.1	1	87.6	55.89	62	63.8	36.2	4.8
China	2004	0.1	1	86.5	53.63	71	62	38	4.7
China	2005	0.1	1	85.3	52.2	81	61.2	38.8	4.7
China	2006	0.1	9.9	92.9	53.88	90	58	42	4.5

Sources: Health Systems 20/20 ([www.healthsystems2020.com/](http://www.healthsystems2020.com/))

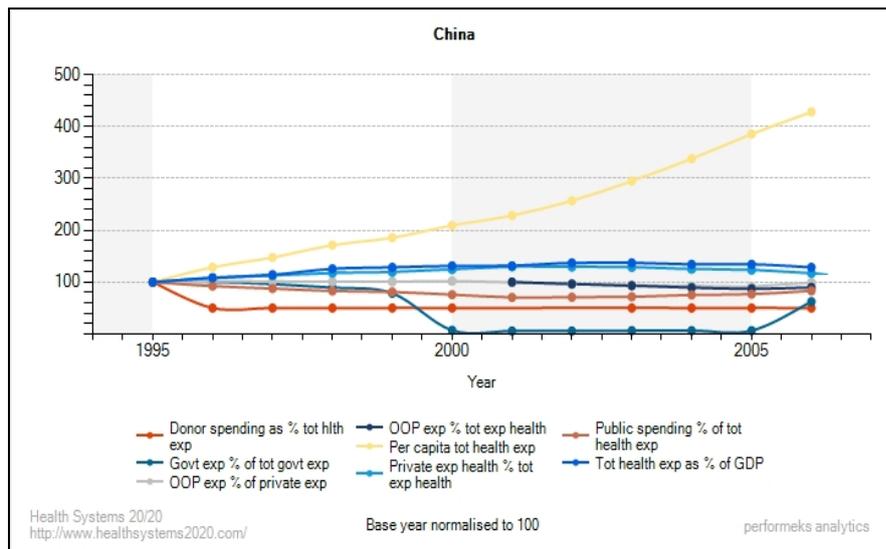


Figure 5. China health trends (Health Systems 20/20, [www.healthsystems2020.com/](http://www.healthsystems2020.com/))

### SMEs' Service Delivery Capacity

The actual patterns of health systems in BRIC-countries can be traced back in a strategic development of organisational aspects related to the environmental circumstances with the involvement of market regulations. Comparative health

patterns have brought together competitive actors on the upfront of large-scale economies by using newly-developed technological innovations within each country's policy framework.

For a further examination about the process of public interventions for the control of health care services together with prevention care, we can take into account the aspects of socialisation for people oriented to receive better health services. The influential elements for health service development have also been related to the spread of information systems, global distributions, and to uses of modern technologies. These structural conditions have been converting the delivery of traditional medicine into a more comprehensive medicine distribution service in order to provide health treatments for entire populations (Lee, 2004).

The development of health systems has been oriented to put more responsive capacities according to public health national requirements. For the reduction of unequal conditions about the distributions of health care service it becomes essential to call up for an increase of participation of present actors in health care activities. According to experts, a series of objectives for the protection of human life in BRIC countries, including the establishment of information and surveillance systems, health trainings, and a strategic promotion of technical cooperation for health service provision at the domestic and international level, can be further strengthened for the advancement of formal partnerships for health management of public and private services (Lee, 2004).

However, as previously discussed, decentralised governmental choices have given reasons to criticize regulatory mechanisms that have been unable to cope with financial and political issues of health programs that have often resulted in a social compromise, between the informatization of the human health process at the global level, and the fragmentation of these systems at country level.

This type of condition has turned the attention of National health authorities toward the delivery of primary care, while an evident division of urban and rural areas has increasingly opened a large gap for health services provision with "the limited sustainability of narrow focus on disease control, and the distortions it causes in weak and under-funded health systems have been criticised extensively in recent years" (World Health Organization, 2008, 13). Moreover, BRIC's composition of health programs has also facilitated an unregulated management of service's delivery based on fee payment systems offered both by the public and private sector, respectively.

In essence, one of the main problems about the delivery of health care globally has been that "unregulated commercialised health systems are highly inefficient and costly: they exacerbate inequality, and they provide poor quality and, at

times, dangerous care that is bad for health" (World Health Organization, 2008, 14). In such light, dealing with health and health care through specialized service distribution has also been done through the inclusion of private providers for their degree of independence which has allowed prevalent growth in the health sector.

Within national regulatory health frameworks, the composition of competitive markets to deliver health trainings, information and technology services, manufacturing drugs, creation of medical infrastructures, and learning tools for human resources according to the uses of advanced medical technologies, among other areas, has been developed in BRIC both at the internal and external level (Rao, Nundy, & Dua, 2005).

Private health providers have substantially positioned themselves for the private market development, also for the absence of sufficient public health investments, where converging factors about health emergencies and the increase of costs in health care have determined their expansion for health management programs.

This process, on the one hand, has accelerated health assistance activities delivered according to population's needs but in a scattered way, and without identifying appropriate cooperation strategies for the protection of health national goals, over long-term periods. On the other hand, the significance of transfer of knowledge for the development of science, and health innovation systems, has facilitated transitioning institutional mechanisms for networking multiple operators in industries, research centres, and in government agencies, in order to contribute to regional innovation and social development.

In the case of Brazil, the interactions between public research centres (e.g. universities) and high-tech companies have been done by mixing entrepreneurial activities and innovation centres through a supporting environment that has tried to maintain a degree of autonomy of technical innovation, also combined with an industrial development (Almeida, 2008). This type of partnership for technology, innovation, and entrepreneurial capacity, has expanded in the form of inter-firm networks that have supported applied research projects funded by the Brazilian government in collaboration with foreign firms (Guedes, 2004).

Nonetheless, the progress that has been done to establish science and technology (S&T) programs with entrepreneurial capacities remains isolated to few initiatives at national level which have not been systematically adapted to health innovative schemes (Guedes, 2004). In fact, it has been highlighted that "the success of the innovation process is a function of investment in S&T. It also depends on the effectiveness of S&T operating as a system. In other words, successful innovation is about the capacity of distinct actors to interact towards

specific goals, adapting themselves to the surrounding environment by which they are influenced" (Guedes, 2004, 231).

The need of systemic mechanisms for the incorporation of multiple actors in innovation and management of health systems still remains quite fundamental for the transfer of knowledge under an organised process that runs in competition terms. However, additional problems have been related with the provision of financial resources required to put into place innovation activities for the stimulation of entrepreneurial activities in health science and health research. In turn, (1) a lack of skill and expertise for the organisational and managerial assessments which reduces competitive and flexible behaviours; (2) a lack of integration of dispersed networks of SMEs in remote areas, making them difficult to share information and overcome biases in health care; (3) a reduced culture about sustainable entrepreneurial activities for health innovation because of the presence of multinationals which have already been operating in the health sector (e.g., pharmaceutical industry) (Lim & Kimura, 2009).

This combination of challenges have mined the innovation environment in newly interacting countries in Asia and Latin America, where innovating economic actors in general have responded to governmental incentives in a diversified manner. In Russia, the commission on Modernisation and Technological Development of the Economy has prioritised intervention areas such as information and communication technologies, or the medical technology to develop research and investment programs, for internal and external cooperation with partners in order to enhance home and international markets' opportunities (Kaartemo, 2009). Some innovation companies together with research centres of this country have consequently been mobilising resources for cooperation projects with foreign partners on a collaborative basis, however in confrontation with state-owned enterprises, which instead have also operated in non competitive terms. For this reason, increasing public barriers for small private companies, have also involved corruption diffusion and bureaucratic controls, which have discouraged new entrepreneurs to deliver innovation services at country level (Kaartemo, 2009).

Despite extensive regulation rules that also apply to the Chinese market, it has been stressed out that "the innovative capacity in the industry is enhancing steadily; government supports innovation activities highly, [...] China has set up a relatively strong public research and innovation system financed by the government. [For instance] the partnership between public research institutions and pharmaceutical companies are emerging. Some sectors, especially biopharmaceutical and the modernisation of Chinese traditional drugs are showing a promising future" (Li, Ke, & Guang, 2005, 50). Regarding the development of Science and Technology, public research centres have been supported by the

government to improve innovation systems while expanding the industrial capacity to advance the country's science and technological sectors by including health innovation systems.

In reality, it has to be taken into account that investment programs for medical innovation have been designed according to the existence of inter-dependent agents, (entrepreneurs, service providers, hospital personnel, trained health staff, researchers) that forms a complex variety of factors, fundamentally emerging within separated communities in demand for medical assistance primarily. Moreover, the presence of the private sector has been limited, or perceived as an alternative choice in comparison with national health care services delivered directly to the public.

The technological advancement in health systems has been another key determinant through which governmental orientations in BRIC have been supportive for the creation of innovation research centres in partnerships with private enterprises which can implement the applicability of S&T projects (e.g.: biotech firms). The resulting composition of available resources and organisational architectures has been performed within several dimensions (technology, innovation, performance and institutionalisation) marking the innovation process of single industries at various stages.

Similarly, the translation of operational modes of production for these industries has been performed also in accordance with prioritised economic objectives of the states involved still with contrasting implications about performance and growth levels already achieved in local, regional and national governance. This is because the provision of responsible health care programs has in most cases depended on national laws and regulations that have limited the access to financing schemes. This condition has determined differential development cycles of health systems nationally as well as internationally.

## **A THEORETICAL SEMANTIC MODEL OF SUSTAINABLE INTERACTIONS FOR HEALTHCARE SYSTEMS**

This theoretical semantic model (Figure 6) refers to the implementation of a decisional process designed for the integration of strategic policy aims by regulating the functionality of health systems in BRIC-countries. From previous discussions, about regional considerations on national and local structural reforms conducted by formal institutions to regulate rapid growth transformations, we can shift our focus on major aspects that create favourable conditions for the implementation of health care distribution.

Fundamental interactions of complex systems can be defined according to coordination of cost-sharing responsibilities in environmental contexts that reflect the level of dynamic and functional institutional organisations stratified at various locations. The collaboration process of multi-functional organisations can be oriented according to adaptability criteria about individual behaviours, and environmental mechanisms which have addressed different recipients and facilitated social networks to respond to multiple objectives (Gao, Ding, & Ying, 2006).

In terms of regional distribution of health care programs, relational characteristics have been found in prevalence pertaining to practical medical procedures for assistance and development duties. A corresponding institutional decentralisation has been considered as a process of deregulation of administrative functions, at the local level, for the management of health care, through which federal agencies, municipal sites, and local administrations, become institutional components in national development plans which need to focus within different dimensions.

In fact, the causal relationships being formalised according to specified health criteria could determine the level of future dimensional interactions between governmental agencies, in collaboration with health networks managing the ground process for the local population while enabling the concretisation of decisional process at an institutional level.

Within this type of framework, BRIC have programmed and supported intervention policies to solve problems that have been related to health emergencies in prioritised areas, for instance. Nonetheless, an aggravation of problems has also required more attention for the execution of coherent health targets, which have been normatively planned, but with a limited elaboration in respect to health services and preventive care.

This conditional status about national health programs has also meant that integration between the governmental capacities – with a certain degree of effectiveness of local administrations – still remains a central aspect for the existence of institutional capacities objectively addressing health needs of the population. In addition to this, the proposed model puts into question a decentralisation of resources for different overlapping dimensions.

From the perspective of health management providers, the approximation of institutional interventions leaves an open gap between the various forms of administration, and the respondents of local agencies managing the necessary available capacities and resources for health care.

In effect, a review of medical assistance procedures and the articulation of managerial capacities developed within a country can critically increase a reorganisation of decentralised assistance centres. The health protection plans with a better quality of health delivery services can also incorporate innovation criteria in order to raise the level of adaptability and effectiveness of health systems, despite conditional obstacles (Vieira-da-Silva, Hartz, Chaves, & Pontes-da-Silva, 2007).

Similarly, for the promotion of institutional interventions emerging compatible layers about working organisations in the health context have also been correlated to an information and communication process that has reflected with the level of accessibility of each organisation. According to this model, it can be recognized that functional relationships from national and local governance level of managerial health capacities have been dependent on the exchange of consistent information and communication data, for the application of health programs delivered by specialised medical staff.

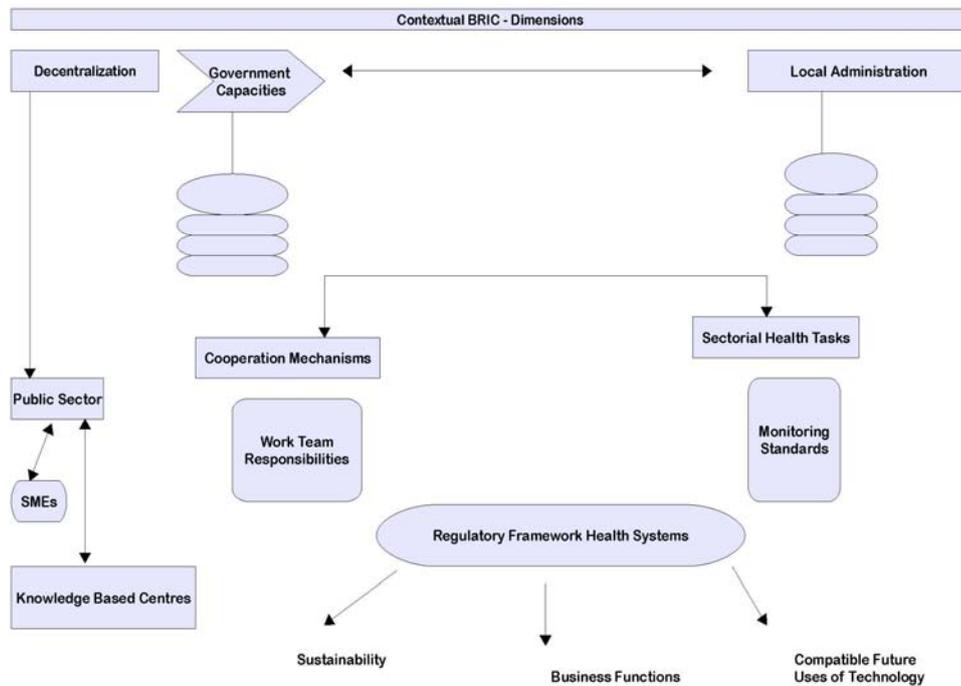


Figure 6. Model adapted from *The implementation of decentralized health systems: a comparative study of five cases in Bahia, Brazil* (Vieira-da-Silva, et al., 2007, 359). In addition, this model has also been adapted from Kanoui, Joubert, and Maury (2000).

For this type of requirement a series of initiatives to establish cooperation practices can follow the direction of developing,

- (a) a renewal of health standards,
- (b) liaison links between the private and the public sector for the systematic functioning of health care services in a continuous mode,
- (c) integration of available documentation,
- (d) formation of trained medical personnel for the adaptation to innovation changes, and health care distribution.

(Groenewald & Le Roux, 2009).

For the institutional identification of working organisations located in separated contexts some level of attention has to be given to decision-making actors, who have been responsible for decentralising health activities in own communities. At the same time, ensuring that an appropriate monitoring practice can understand the capacity level of working agencies at various locations together with integration of an informative process about health plans with expected results for the regions involved which can also be a quite considerable task.

For this fragmentation of functions, the development of cooperative relations to assist and provide internal and external expertise within an intra-regional health management activity and in contrast with centralised management models can also include the expansion of technical health support systems. Several international agencies, as UNESCAP, have highlighted the growing significance of health systems combined with health innovation technologies for the reduction of killing diseases, especially in rural areas. Because a specialised healthcare distribution that can match with health tasks in different sectors, can as well incorporate the expansion of a skilled workforce, the upgrading of medical infrastructures, and the supply of essential drugs, where ICT (Information, Communication, Technology) can be adopted in order to strengthen the ability of BRIC for better medical provision (Economic Social Commission for Asia and the Pacific [ESCAP], 2009).

Finally, a comparative analysis of BRIC countries about their partnerships between public and the private sector has helped to identify the level of dependence of inter-operating agents that can create knowledge in order to share common competencies and responsibilities. In the meantime, governmental organisations in relation with the industries and research institutions have acted significantly for a development of innovation stages in societal environments that have been responsible for the maintenance of competitive environments, including the health care systems (Dou, 2008).

In order to facilitate the work of national institutions on aspects such as information and technology systems, international partnerships for scientific cooperation, and the transfer of knowledge of research institutions, a required key determinant is the acceleration of important regulatory frameworks drafted for dynamic contexts directly concerning health systems development.

For this reason, the creation of specialised agencies to monitor critical information about the process of strategic global innovation can be elaborated at the national level, with a modified diffusion of health science and technologies to enlarge future perspectives on health systems integration and development for conceptual frameworks within and across countries also globally.

## **CONCLUSION**

From previous accounts, the implementation of state's functions for coherent regulatory mechanisms addressing users' needs depends on sustainable initiatives for human health protection that need to be harmonized between centralised health systems, and local infrastructures by strengthening local providers in the private, and public sector.

At the same time, business innovation models can increase effective organisational practices in health, while improving the quality of health standards for national short-term/long-term policy goals. In view of the fact, that changing aspects of technology diffusion will depend on a continuous process upgrading the formation of institutional relationships that become critical for the uses of compatible technologies in the future (Cegielski, Reithel, & Rebman, 2005).

Fitting with the current IT models in health, it remains an integral part of a renovation path for a possible standardisation of procedures, and a timely response to health emergencies. However, structural delivery aspects of health information systems in decentralised areas can represent a constant problematic issue for BRIC-countries to encourage widespread public participation.

In essence, a broader strategic approach for health and health care is only part of a solution for the betterment of aligned societies supporting a consensual orientation and sustaining an effective management of health systems, in order to build up technological capabilities for community development through open information and communication across societies.

## ACKNOWLEDGMENT

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## REFERENCES

- Almeida, M. (2008). Innovation and entrepreneurship in Brazilian universities. *International Journal of Technology Management and Sustainable Development*, 7(1), 39–58.
- Cegielski, C. G., Reithel, B. J., & Rebman, C. M. (2005). Emerging information technologies: Developing a timely IT strategy. *Communications of the ACM*, 48(8), 113–118.
- Collins, C., Araujo, J., & Barbosa, J. (2000). Decentralising the health sector: Issues in Brazil. *Health Policy*, 52, 113–127.
- Danishevski, K., & McKee, M. (2005). Reforming the Russian health-care system. *The Lancet*, 365(9464), 1012–1014.
- Dou, H. (2008). Recent progress in competitive intelligence, competitive technical intelligence and knowledge management. *Revista Ibero-americana de Ciência da Informação (RICI)*, 1(1), 89–113.
- Economic Social Commission for Asia and the Pacific (ESCAP). (2009). Policy brief on ICT applications in the knowledge economy. *ESCAP U.N. Economic and Social Commission for Asia and the Pacific*, 7(December), 1–4.
- Eggleston, K., Li L., Meng, Q. Y., Lindelow, M., Wagstaff, A. (2008). Health service delivery in China: A literature review. *Health Economics (Health Econ.)* 17, 149–165. Published online 20 September 2007 in Wiley InterScience at: [www.interscience.wiley.com](http://www.interscience.wiley.com).
- Elias, P. E. M., & Cohn, A. (2003). Health reform in Brazil: Lessons to consider. *American Journal of Public Health*, 93(1), 44–48.
- Galbraith, J. K., Krytynskaia, L., & Wang, Q. (2004). The experience of rising inequality in Russia and China during the transition. *The European Journal of Comparative Economics*, 1(1), 87–106.
- Gao, L., Ding, Y., & Ying, H. (2006). An adaptive social network-inspired approach to resource discovery for the complex grid systems. *International Journal of General Systems*, 35(3), 347–360.
- Gottumukkala, S. (2009). Health is wealth for SMEs. *The Economic Times & Indiatimes*, 2 June. Retrieved from <http://articles.economictimes.indiatimes.com>
- Groenewald, T., & Le Roux, M. (2009). Semantic and metaphoric reflection on the training of decentralized staff responsible for supporting students in terms of

work-Integrated learning: A Distance Education University scenario. *Asia*

*Pacific Journal of Cooperative Education*, 10(2), 121–140.

- Guedes, T. M. M. (2003). Networks of innovation in biotechnology. The Brazilian experience. *International Journal of Technology Management Sustainable Development (TMSD)*, 2(3), 219–236.
- Hank, L., & Kimura, F. (2009). The internationalisation of SMEs in regional and global value chains. *Inter-American Development Bank*. Retrieved from [http://www.iadb.org/intal/aplicaciones/uploads/ponencias/i\\_Foro\\_LAEBBA\\_2009\\_07\\_01\\_Lim-Kimura.pdf](http://www.iadb.org/intal/aplicaciones/uploads/ponencias/i_Foro_LAEBBA_2009_07_01_Lim-Kimura.pdf).
- Havlik, P., Stollinger, R., Pindyuk, O., Hunya, G., Dachs, B., Lennon, C., et al. (2009). EU and BRICs: Challenges and opportunities for European competitiveness and cooperation. *Industrial Policy and Economic Reform Papers No. 13*. European Commission Enterprise and Industry Directorate-General, European Commission. Brussels, EU Economic Analysis and Evaluation. Retrieved from [http://ec.europa.eu/enterprise/newsroom/cf/itemshortdetail.cfm?item\\_id=3479](http://ec.europa.eu/enterprise/newsroom/cf/itemshortdetail.cfm?item_id=3479).
- Hironobu, S., Abrucio, F. L., & Vargas, G. (2008). The promises and results of new public management in Brazil: The case of social health organizations in Sao Paulo. *RAE*, 48(3), 64–80.
- Huang, Y. (2004). Bringing the local state back in: The political economy of public health in Rural China. *Journal of Contemporary China*, 13(39), 367–390.
- Indian Council of Medical Research. (2007). *Health Research Policy – (ICMR)*. New Delhi, India: Author.
- Jiang, L., & Gan, C., Kao, B., Zhang, Y., Zhang, H., & Cai, L. (2009). Consumer satisfaction with public health care in China. *Journal of Social Sciences*, 5(3), 223–235.
- Kanoui, H., Joubert, M., & Mauryoe, G. (2000). A semantic-based kernel for advanced health information systems. *Med. Inform.*, 25(1), 19–43.
- Lavalle, A. G. (2008). Contextual politics of service delivery reforms: Lessons from Delhi, Mexico City and São Paulo comparison. *IDS Bulletin*, 38(6), 18–26.
- Lee, L. (2004). The current state of public health in China. *Annu. Rev. Public Health*, 25, 327–339.
- Li, Z., Ke, W., & Guang, C. (2005). Developing innovative capacity in China to meet health needs. MIHR report to CIPIH. WHO Ref. CIPIH Study 10d (DGR). Ministry of Health Brazil. Prepared by *The Centre for Management of Intellectual Property in Health Research and Development (MIHR)*. Retrieved from [www.who.int](http://www.who.int).
- Liu, Y., Rao, K., Wu, J., & Gakidou, E. (2008). Health system reform in China 7: China's health system performance. *The Lancet*. DOI: 10.1016/S0140-6736(08)61362-8.
- Ma, J., Lu, M., & Quan, H. (2008). From a national, centrally planned health system to a system based on the market: Lessons from China. *Health Affairs*, 27(4), 937–948.

- Medici, A. C. (2002). Financing health policies in Brazil achievements, challenges and proposals. Washington, D.C.: *Inter-American Development Bank*. Retrieved from [www.iadb.org](http://www.iadb.org).
- Meessen, B., & Bloom, G. (2007). Economic transition, institutional changes and the health system: Some lessons from rural China. *Journal of Economic Policy Reform*, 10(3), 209–231.
- Organization for Economic Co-operation and Development (OECD). (2006). Reforming Healthcare. *OECD Economic Surveys: Russian Federation*. Paris: Author.
- Organization for Economic Co-operation and Development (OECD). (2010). Quality of life - Health - Infant mortality. *OECD Factbook 2010: Economic, Environmental and Social Statistics*. Paris: Author.
- Parfitt, T. (2005). The health of Russia's children. *World Report*, 366(9483), 357–358. Publication available online: [www.thelancet.com](http://www.thelancet.com).
- Pefile, S., Li, Z., Ke, W., Guang, C., Chamas, C., Bhojwani, H., & Hering, I. (2005). Developing innovative capacity in Brazil to meet health needs. MIHR report to CIPIH. WHO Ref. CIPIH Study 10d (DGR). Ministry of Health Brazil. Prepared by *The Centre for Management of Intellectual Property in Health Research and Development (MIHR)*. Retrieved from [www.who.int](http://www.who.int).
- Rezaie, R., Frew, S. E., Sammut, S. M., Maliakkal, M. R., Daar, A. S., & Singer, P. A. (2008). Brazilian health biotech—Fostering crosstalk between public and private sectors. *Nature Biotechnology*, 26(6), 627–644.
- Rimashevskaja, N. M., & Korkhova, I. V. (2004). Poverty and health in Russia. *Sociological Research*, 43(3), 5–30.
- Rozenfeld, B. A. (1996). The crisis of Russian health care and attempts at reform. In DaVanzo, J. (ed.), *Russia's Demographic 'Crisis'* (pp. 163–174). Santa Monica, CA: RAND publisher.
- Serdar, Y. (2001). Book review: Governance, decentralization and reform in China, India and Russia. *National Tax Journal*, 54(4), 853–860.
- Shishkin, S. (1998). Priorities of the Russian health care reform. *The Croatian Medical Journal*, 39(3), 298–308.
- Sujatha, R. K., Madhurima, N., & Singh, D. A. (2005). Financing and delivery of health care services in India. *NCMH Background Papers*. National Commission on Macroeconomics and Health Ministry of Health & Family Welfare Government of India, New Delhi.
- Tragakes, E. & Lessof, S. (2003). Health care systems in transition: Russian Federation. *Copenhagen, European Observatory on Health Systems and Policies*, 5(3), 117–157.
- Turner, C. (1997). SMEs and the evolution of the European information society: Policy themes and initiatives. *European Business Journal*, 9(4), 47–52.
- United Nations (2011). *World Population Prospects* [CD-ROM Edition]. Population Division, Department of Economic and Social Affairs.
- Valteri, K. (2009). Russian innovation system in international comparison – the BRIC countries in focus. *Electronic Publications of Pan-European Institute* 22. Turku School of Economics in Finland. Retrieved from [www.tse.fi/pei](http://www.tse.fi/pei).
- Vieira-da-Silva, L. M., Hartz, Z. M., Chaves, S. C. L., & Pontes-da-Silva, G. A., & Paim, J. S. (2007). The implementation of decentralized health systems: A comparative

- study of five cases in Bahia, Brazil. *Cad. Saúde Pública*, Rio de Janeiro, 23(2), 355–370.
- Werner, B. (2008). *The Brazilian economy: Growth and development*. Boulder, CO: Lynne Rienner Publishers.
- World Health Organization (WHO), China (2004). Country cooperation strategy: WHO China strategic priorities for 2004-2008. *The Office of the World Health Organization Representative in China*. 31 July 2004 (Final), Beijing.
- World Health Organization (WHO) (2006). Country cooperation strategy 2006-2011 India. *WHO Country Office for India*, New Delhi.
- World Health Organization (WHO), SEARO. (2008). Decentralization of health system and its management. *Country Office Nepal*. Retrieved from [www.nep.searo.who.int/](http://www.nep.searo.who.int/)
- World Health Organization (WHO) (2008). Primary health care. *The World Health Report 2008*. WHO Library Cataloguing-in-Publication Data.
- Zavatta, R. (2008). Financing technology entrepreneurships & SMEs in developing countries: Challenges and opportunities. Brazil Country Study. *InfoDev publication*. Economisti Associati SRL in collaboration with Zernike Group BV Meta Group SRL. Retrieved from [www.infoDev.org](http://www.infoDev.org).