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Privatization of Saudi Healthcare Facilities: Is it a Good Strategy?

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Abstract: ***This study investigates the general growth pattern of hospitals as a central component of the healthcare delivery system in Saudi Arabia as well as the distribution of private versus public hospitals, beds, physicians, and nurses with respect to the population characteristics of Saudi regions. The results revealed that the redistribution of public hospital care facilities toward periphery and emerging regions is at the expense of population needs in the core regions. The core has the lowest number of beds per 1,000 people and the lowest numbers of physicians and nurses per 10,000 people compared with emerging and periphery regions. In addition, the results revealed that the existing spatial distribution of private hospitals does not fulfill either the need for healthcare facilities or the form of competitive healthcare markets in Saudi Arabia, despite a government subsidy policy. There is a significant gap between the population and private hospital resource ratios in the emerging and periphery regions, since private hospital construction could not keep up with rapid population growth. The regression analysis suggests that the level of competition is quite different in public versus private hospitals, which form two different geographic markets. Public hospitals tend to be population oriented while private hospitals tend to be market oriented. Regional planners and healthcare policymakers should take into consideration the existence of not only private but also public hospitals alongside population needs within the complex of the Saudi regional system in order to balance the spatial distribution of healthcare facilities and form competitive public–private healthcare markets in Saudi Arabia.***

Keywords: Privatization, Public, Private, Hospital resources, Spatial distribution, Needs, Saudi healthcare system

1. Introduction

Inequities in health exist all over the world, showing systematic differences in health between different socioeconomic groups [1-5] and between cities and regions [6-11]. The situation in the Arab world is even worse [12-15]. The present study focuses on the Kingdom of Saudi Arabia, a country whose healthcare system is currently under tremendous pressure. Rapid socio-economic growth coupled with a growing burden of government healthcare spending over the last 4 decades has created a huge gap between the need for and provision of public health facilities among and between Saudi regions. As with many countries around the world, the Saudi government subsidizes the establishment of private healthcare facilities with the aim of improving the quality of healthcare and the distribution of healthcare facilities with respect to demand and market competition.

A popular topic in recent healthcare policy literature involves the effects of healthcare privatization [3-4,11,16]. These studies provide evidence in support of better performance of privatized healthcare practices at improving the accessibility of their services to patients. In addition, the results of these studies suggest that privatization of healthcare facilities increases competition among the public health facilities, which in turn directly influences patient opinions of service delivery. However, other empirical studies [1,9,17-18] provide evidence that privatization of healthcare facilities leads to escalated costs of private services and simultaneously generates inequalities in access to healthcare for the poor. These studies argue that reducing government investment in public healthcare facilities in order to subsidize private healthcare facilities has a negative impact on the healthcare quality of public healthcare facilities (especially in public hospitals), which increases dissatisfaction with them. It is well documented that the process of privatization leaves large sections of the population, particularly the poor, dependent on an inadequately equipped and shrinking public sector, while the private sector expands rapidly and becomes more high cost and available only to those able to pay [1,11, 19-20]. In addition, investigation of geographical distribution of public and private healthcare facilities illuminates the degree to which they develop with respect to the healthcare needs of the population. Accessibility is considered as undermining the equity principle of the provision of healthcare [21-23].

The purpose of this study is to investigate the spatial distribution of private and public hospitals according to the classification of Saudi regions (i.e., developed, developing, and least developed regions) with respect to the population characteristics of regions as an index of need. Despite the importance of other factors, such as income and health insurance, these factors are not included in the study due to lack of regional data. However, this study adopts a regression analysis technique to analyze the relationships between the number of public and private hospitals and the characteristics of Saudi regions.

The remainder of the paper is organized as follows. Background information on the policy for the privatization of healthcare facilities in Saudi Arabia is given in the second section. The third section presents the materials and methods. The empirical results are discussed in the fourth section, and the final section concludes with some policy recommendations and suggestions for further research.

2. Privatiation Process in Saudi Health System

Healthcare in Saudi Arabia is financed by the government through the Ministry of Finance, contributing approximately 75% of total healthcare spending in 2014, down from 83% in 2010 [24]. During the last 2 decades, the Saudi government has increased its healthcare budget allocation from SAR8.6bn (USD2.3bn) in 1992 to SAR16.9bn (USD16bn) in 2004 and to more than SAR60bn in 2014 [25]. On average, healthcare spending is estimated to have been 7% of GDP during the last 22 years [26]. This growing burden of healthcare

spending has forced the government to introduce initiatives to encourage private-sector participation in the provision of healthcare services, either through direct investment or through public–private partnerships [27]. In early 2007, several healthcare privatization programs were introduced by the Ministry of Health (MOH) with the aim of reducing government healthcare expenditure, improving healthcare system management, and generating world-class healthcare standards for citizens [28]. Saudi healthcare policymakers argue that privatization would reduce government expenditure rather than the complexities of decision-making at governmental hospitals and the quality of service would improve in response to market demand. Based on such ideas, a number of government hospitals already have been sold to the private sector while others have been rented to private operators [27,29]. By 2030, the Ministry of Health plans to have privatized 295 hospitals and 2,259 health centers [30]. During a recent interview by The Economist with Deputy Crown Prince Mohammed bin Salman about Vision 2030 and different plans to privatize some sectors of the economy, including health, he stated that this would ensure greater productivity and transparency, and eliminate wastage of medicines [31].

Beside the growing burden of healthcare spending, many other factors have encouraged the Saudi government to introduce the privatization process into its healthcare system. Among these factors is the demographic shift underway in Saudi Arabia. The country's population is currently about 31.5 million; it is expected to reach 39.1 million in 2030, and to exceed 46 million in 2050 [32]. The proportion of people in Saudi Arabia aged 60 years or more is predicted to be almost 21% of the total population by the end of 2050 compared with 5% in 2015. In addition, the number of people aged 80 years or more is expected to be 2.7% in 2050 compared with only 0.5% in 2015 [32]. The aging population will eventually create increased demand for healthcare services in the country [33]. In addition, young people below the age of 34 years currently account for about 60% of the total Saudi population [34]. This rapidly growing young population is a key factor that will drive demand for healthcare services in the country in the near future. Another factor that will put more pressure on the Saudi healthcare system is the ongoing shift of disease patterns from communicable to non-communicable diseases. Chronic non-communicable diseases (e.g., diabetes, cardiovascular disease, and cancer) are on the rise and are now the major cause of death among the elderly in Saudi Arabia [35]. Excess weight and obesity are highly prevalent in the country relative to the rest of the world: 69% of the Saudi population is overweight and 33% is obese [26]. Demand for healthcare services in Saudi Arabia will continue to rise, backed by rapid young population growth, a growing aging segment, and the prevalence of long-term non-communicable diseases. It is argued that privatization would speed up delivery of medical services by generating perfect competition, as the Saudi government would benefit in two respects: first, by curtailing public health expenditure and second, by raising revenue for the MOH via a new source. Thus, privatization of healthcare system is seen as an "invisible hand" capable of solving many health-related problems facing Saudi Arabia. The private healthcare industry continues to grow steadily over time. Between 1992 and 2014, there was an 88% increase in the number of private hospitals, from 75 to 141, accompanied by more than 8,100 extra hospital beds, representing a 110% rise in bed count during the same period. On average, private hospitals employed 4.3 physicians per 10,000 people in 2014, compared to 1.8 physicians per 10,000 in 1992, while the ratio of nurses per 10,000 people went from 3.4 to 7.2, respectively, between 1992 and 2014. By comparison, the majority of state-run hospitals belong to the MOH, which as of 2014 operated 270 hospitals with a total of 40,300 beds. Between 1992 and 2014, the numbers of MOH hospitals and beds increased by 55.2% and 49.8%, respectively. The ratios of physicians and nurses per 10,000 people increased from 5.7 to 8.1, and from 14.4 to 22.6, respectively, over the same period.

Recent government actions, which include the promotion of privatization and a new medical insurance law, are expected to increase healthcare demand and investment opportunities dramatically. As of February 2014, total ongoing healthcare projects in Saudi Arabia stood at SAR55.5bn (USD14.8bn), which represents approximately 48.5% of all healthcare projects in the Gulf Cooperation Council at the time [35]. To help finance these projects, Saudi Arabia has been liberalizing some of the rules governing investment in the health industry. These measures are expected to drive the expansion of the private healthcare sector at a 5-year compound annual growth rate of 10.4%, increasing from SAR32.7bn (USD8.71bn) in 2013 to SAR53.5bn (USD14.26bn) by 2018. According to new regulations announced by MOH in 2014, citizens who are not healthcare professionals will be allowed to run hospitals for the first time. The new rules are designed to attract investment from global healthcare companies [34]. Previously, non-Saudis were prevented from owning any clinical centers in the kingdom. The governing authority for foreign direct investment in the kingdom, announced in early 2016 that more than 19 US healthcare companies were expected to enter the Saudi market in 2016 [36]. Furthermore, health insurance is already compulsory for foreigners residing in Saudi Arabia and for some segments of the Saudi population who work in the private sector. In late 2014, the Council of Cooperative Health Insurance announced plans to require all temporary visitors to the kingdom and their dependents, with the exception of religious pilgrims, to obtain private health insurance [37]. This was followed by an announcement by the MOH that all Saudi citizens would be covered under the national cooperative insurance fund [38] Due to several government healthcare laws, the speed of the privatization process in the Saudi healthcare system has been accelerating in recent years and will increase in the near future. However, very little is understood about the impact of this legislation and these policies on equitable healthcare distribution and accessibility of health services around the country, including periphery regions, small- and medium-sized cities, and even rural and remote communities.

3. Material and Methods

Data on public and private hospitals (including number of hospitals, beds, physicians, and nurses) per Saudi administration region were obtained directly from Saudi health statistical reports for the years 1992 and 2014 [39-40]. Census population data for each Saudi region were obtained directly from

the General Authority for Statistics Database for the same period of time [41-42]. The administrative classification of Saudi Arabia divides the Kingdom into 13 regional planning units, namely, Riyadh, Makkah, Madinah, Qassim, Eastern Province, Jizan, Najran, Aseer, Baha, Hail, Tabouk, Northern Border, and Jouf region [43]. These 13 regions were classified into three types of regions: 3 developed regions (Riyadh, Makkah, and Eastern Province); 4 emerging regions (Qassim, Madinah, Aseer, and Jizan); and 6 least developed regions (Hail, Tabouk, Baha, Najran, Jouf, and Northern Border). The classification was based on different socio-economic variables, including population size, educational level, health level, economic development level, and geographical characteristics [44-45]. The spatial analysis unit employed in this study is these 13 Saudi regions with their classification categories (Figure 1).

Figure 1: Map of Saudi Arabian Regions.
Source: Ministry of Municipal and Rural Affairs, 2000

A descriptive statistical technique was used to investigate the spatial pattern of growth of private versus public hospital facilities in Saudi Arabia, according to the classification of regions (i.e., developed, developing, and least developed regions). Then, a regression analysis technique was used to analyze the relationships between each hospital variable in both the public and private sectors and the population characteristics of Saudi regions. The hospital variables (number of hospitals, beds, physicians, and nurses) in both the public and private sectors were taken separately as dependent variables while regional populations were taken as independent variables. Perhaps, the most notable market factor affecting hospital construction activity was population growth, either was present throughout a market or was localized in certain areas [21,23]. This is a major factor behind the first type of construction activity: either building new hospitals or expanding general hospital capacity. The most direct link between population size, concentration, and distribution of healthcare resources relates to the population threshold levels that have been identified for various services [7,21,46]. Although health insurance and income per capita are important variables that affect hospital use and distribution, they are not included in the analysis due to lack of data at the regional level.

4. Emprical Results

The spatial distribution of public and private hospitals and related variables are investigated in a hierarchical manner according to the three types of Saudi regions. Saudi's developed regions are known as the "corridor development" or "core," which consists of Riyadh (the capital), Makkah (the commercial gate) and Eastern Province (the oil gate). These three developed regions accounted for 66% of the total Saudi population in 2014 compared with 64% in 1992. The four developing regions are known as "emerging" regions, and together accounted for 23% and 24% of the total population in 1992 and 2014, respectively. The six least developed regions are known as "periphery regions," and the ratio of their population accounted for 12% and 11% of the total population in 1992 and 2014, respectively. In 2014, the spatial distribution of the number of public hospitals according to regional type was 45% in the core regions, 32% in the emerging regions, and 23% in the periphery regions compared with 42%, 35%, and 23% in 1992, respectively (Table 1). The distribution ratio of public hospital beds was 55%, 26%, and 18% in 2014 compared with 55%, 29%, and 16% in 1992, respectively. The spatial distribution ratio of public hospital physicians and nurses in the core regions was 55% and 56% in 2014 compared with 56% and 58% in 1992, respectively, while the emerging and periphery regions shows no change (26% for physicians and 19% for nurses) during the same period. However, for the private healthcare sector a different spatial pattern emerges when private hospitals are considered.

The spatial distribution of the number of private hospitals according to regional type was 74% in the core regions, 23% in the emerging regions, and only 4% the periphery regions in 2014 compared with 83%, 13%, and only 4% in 1992, respectively. Meanwhile, the distribution ratio of private beds was 81%, 16%, and 2% in 2014 compared with 89%, 9%, and 3% in 1992, respectively. The distribution ratio of private physicians in the core region decreased from 91% to 85% between 1992 and 2014. The emerging regions increased their physician ratio from 6% to 13%, while the periphery regions stayed the same at 2% during the same period. A similar spatial pattern emerges when private nurses are considered. The core regions decreased their private hospital nurse share by 7%, while the emerging regions increased their share by 8% during the 1992–2014 period. The periphery regions slightly decreased their share by 1% over the same period.

The abovementioned spatial distribution of public and private hospital resources according to regional type illustrates that although the ratios of public hospital resources were higher than the population ratio in all three types of Saudi regions, except for the core regions, due to huge government investment in public healthcare construction projects all over the country. The ratios of private hospital resources were higher than the population ratios in the core regions only because of their easy accessibility to a large market area by alternative transportation systems, and were lower than the population ratio in the emerging and periphery regions. Apparently, there was a great gap between population and private hospital resource ratios in the emerging and periphery regions, since private hospital construction could not keep up with rapid population growth.

The spatial distribution of the number of public and private hospital beds per 1,000 people according to Saudi regional type is illustrated in Table 1. Despite the higher ratio of people living in the core regions, they had the lowest number of public hospital beds per 1,000 people in 1992 and 2014 (1.4 and 1.1, respectively) compared with the emerging regions (1.9 and 1.5, respectively), and the periphery regions (2 and 2.1, respectively). Conversely, the core regions had the largest number of private hospital beds per 1,000 people in 1992 and 2014 (0.6 and 0.7, respectively), followed by emerging regions (0.2 and 0.3, respectively), and about (0.1) for periphery regions for both years, respectively. The reason for the superior number of private hospital beds per 1,000 people in the core regions can be explained by their larger market size and extensive transportation network services, which allow access to a large market area. This misdistribution of healthcare facilities is also observed in the spatial distribution of hospital medical staff. A different spatial pattern emerges when the number of public and private hospital physicians and nurses per 10,000 people are considered. For 1992 and 2014, the periphery regions had the highest number of both physicians (7.9 and 14, respectively) and nurses (15.9 and 37.7, respectively) per 10,000 people compared with the core's number for physicians (5.0 and 6.7, respectively) and nurses (13 and 19.1, respectively), and the emerging regions' numbers for physicians (7.1 and 9.3, respectively) and nurses (17.6 and 25.1, respectively).

Similar to the spatial distribution of private hospital beds, in 1992 and 2014, the core regions had the highest numbers of physicians (2.6 and 4.4, respectively) and nurses (6.4 and 9.6, respectively) per 10,000 people, while the periphery had the lowest numbers of private physicians (0.3 and 0.5, respectively) and nurses (0.6 and 0.7, respectively). However, the emerging regions increased their numbers of physicians per 10,000 people from 0.5 in 1992 to 1.9 in 2014, and the numbers of nurses per 10,000 people increased from only 0.7 in 1992 to 3.7 in 2014. Thus, the analysis of spatial distribution of hospital beds, physicians, and nurses illustrates the unbalanced distribution of private hospital healthcare facilities with respect to population, even though accessibility to healthcare facilities is an important factor, especially for periphery and more remote populations. Although there is a government subsidy policy for the development of private hospitals to form a competitive market, apparently its distribution has not achieved this target yet.

In order to evaluate the healthcare market in Saudi Arabia, it is important to understand patterns and determinants of public and private healthcare facility distributions. This study investigates the distribution of public and private hospital facilities by using a regression analysis and considering demographic characteristics of the Saudi regions. However, for simplification of the analysis, the 2014 date only is used for this purpose. The numbers of hospitals, beds, physicians, and nurses in both the public and private sectors are taken separately as dependent variables and regional populations are taken as independent variables. These variables are presented in Table 2, and the regression results of the spatial distribution of public and private hospitals, beds, physicians, and nurses are presented in Table 3.

According to the analysis results, population is found to have a significant effect (1% level) on the distribution of public hospitals, beds, and nurses but not on physicians in Saudi Arabia, while the population variable is found to have an insignificant effect on the distribution of private hospitals and related facilities. Even though the population is usually taken as a basic criterion during the hospital planning process, private hospitals tend to be market oriented rather than population oriented. Thus, the regression analysis suggests that the level of competition is quite different in the two types of hospitals, which form two different geographic markets. Public hospitals tend to be population oriented while private hospitals tend to be market oriented.

5. Discussion and Conclusion

This study investigates the general growth pattern of hospitals as a central component of the healthcare delivery system in Saudi Arabia and the distribution of private hospitals, beds, physicians, and nurses in comparison to public ones with respect to the population characteristics of Saudi regions. The results of the analysis reveal that the growth of public hospital resources, including general hospitals, beds, physicians, and nurses, does not follow the growth pattern of population in the core regions, despite the fact that the core has the highest population concentration. However, public hospital resources outpace the population ratio in both emerging and periphery regions. Furthermore, the spatial distribution of hospital beds per 1,000 people and physicians and nurses per 10,000 people confirmed this mismatch distribution. The core has the lowest number of beds per 1,000 people and the lowest numbers of physicians and nurses per 10,000 people compared with emerging and periphery regions. The reason for this mismatch can be explained by the Saudi government's strategy to reduce inequalities in the spatial distribution of healthcare facilities between regions. However, the redistribution of public hospital care facilities toward periphery and emerging regions has come at the expense of population needs in the core regions. Thus, in order to meet the healthcare needs of people and to form equitable public healthcare distribution in the country, healthcare policies need to focus more on the needs of the core population along with the needs of populations in emerging and periphery regions.

The results of the spatial distribution of private hospital resources reveal that private hospitals are concentrated in highly populated regions. The growth of private hospitals resources has been significantly outpaced the growth pattern of the population in core regions, while population growth has outpaced the growth of private healthcare resources in both the emerging and periphery regions. In addition, the core regions have the highest number of private hospital beds per 1,000 people and the highest numbers of physicians and nurses per 10,000 people out of all three region types. The reason for the lower contribution of the private healthcare sector in emerging regions and, to a larger degree, periphery regions can be explained by their small market sizes and limited market areas due to limited transportation network services. The existing spatial distribution of private hospitals does not fulfill either the need for healthcare facilities or the form of competitive healthcare markets in the country. Thus, there is an urgent need to increase the number of private

hospital resources, especially in the periphery regions, in order to meet the healthcare needs of people and to form competitive healthcare markets. In this case, health policymakers need to set an explicit strategy in order to stimulate the decentralization of private hospitals toward emerging and periphery regions. More government subsidies, tax exemption, and free land incentive policies for national and international private healthcare providers biased toward emerging and periphery regions could make a difference. In addition, new regulations and procedures for the process of approving private hospitals need to be introduced by the Ministry of Municipal and Rural Affairs.

Finally, regional planners and healthcare policymakers should take into consideration the existence of not only private but also public hospitals alongside population needs within the complex of the Saudi regional system in order to balance the spatial distribution of healthcare facilities and to form competitive public–private healthcare markets. Balanced distribution of hospital resources in both the public and private sectors, with respect to population, not only would satisfy the healthcare needs of people but also would provide economic development in their regions.

References

[1] Laurell A.C. Health reform in Mexico: The promotion of inequality. International Journal of Health Services 2001, 31: 291–321.
[2] Blendon RJ, Schoen C, DesRoches CM, Osborn R, Scoles KL, Zapert K. Inequities in health care: A five-country survey. Health Affairs 2002, 21(3): 182–188.
[3] Albreht T, Klazinga N. Privatization of health care in Slovenia in the period 1992–2008. Health Policy 2009, 90: 262–269.
[4] Kaczmarek K, Flynn H, Paralusz EL, Krajewski KS, Gericke CA. The process of privatization of health care provision in Poland. Value in Health Regional Issues 2013, 2: 306–311.
[5] Bonfrer I, Poel E, Grimm M, Doorslaer E. Does the distribution of healthcare utilization match needs in Africa? Health Policy and Planning 2014, 29: 921–937.
[6] Reinhardt UE, Hussey PS, Anderson GF. Cross-national comparisons of health systems using OECD data, 1999. Health Affairs 2002, 21(3): 169–181.
[7] Horev T, Pesis-Katz I, Mukamel DB. Trends in geographic disparities in allocation of health care resources in the US. Health Policy 2004, 68(2): 223–232.
[8] Olsen KM, Dahl S. Health differences between European countries. Social Science and Medicine 2007, 64(8): 1665–1678.
[9] Tuğba S, Terzi F, Dokmeci V. Privatization of healthcare facilities in Istanbul. European Planning Studies 2011, 19(6): 1117–1130.
[10] Maharani A, Femina D, Tampubolon G. Decentralization in Indonesia: Lessons from cost recovery rate of district hospitals. Health Policy and Planning 2015, 30: 718–727.
[11] André C, Batifoulier P, Jansen M. Health care privatization processes in Europe: Theoretical justifications and empirical classification. International Social Security Review 2016, 69 (1): 3–23.
[12] Al-Abbadi I. Health care equity issues in Middle East. Paper presented at The ISPR 11th Annual European Congress, Athens, Greece, November 10, 2008. Available from: http://www.ispor.org/news/articles/july09/hce.asp
[13] Mobaraki AE, Söderfeldt B. Gender inequity in Saudi Arabia and its role in public health. Eastern Mediterranean Health Journal 2010, 16(1): 113–118.
[14] Ismail EA. The role of education and wealth in health inequalities in Egypt. Life Science Journal 2013, 10(3): 272–279.
[15] Alhowaish AK. Spatial variation of Saudi health services: An analytical study. Journal of the Gulf and Arabian Peninsula Studies 2014a, 40(153): 197–225 [in Arabic].
[16] Hebrang A, Henigsberg N, Erdeljic V, Foro S, Vidjak V, Grga A, Macek T. Privatization in the health care system of Croatia: Effects on general practice accessibility. Health Policy and Planning 2003, 18(4): 421–428.
[17] Newbrander W, Parker D. The Public and private sectors in health: Economic issues. International Journal of Health Planning and Management 1992, 7(1): 37–49.
[18] Leung GM, Tin KYK, O'Donnell O. Redistribution or horizontal equity in Hong Kong's mixed public-private health system: A policy conundrum. Health Economics 2009, 18(1): 37–54.
[19] Sen K, Koivusalo M. Health care reforms and developing countries—A critical overview. The International Journal of Health Planning and Management 1998, 13(3): 199–215.
[20] Mills A, Brugha R, Hanson K, McPake B. What can be done about the private health sector in low-income countries? Bulletin of World Health Organization 2002, 80(4): 325–331.
[21] Goodman DC, Fisher E, Stukel TA. Chang C. The distance to community medical care and the likelihood of hospitalization: Is closer always better? American Journal of Public Health 1997, 87(7): 1144–1150.
[22] Gulliford M, Figueroa-Munoz J, Morgan M, Hughes D, Gibson B, Beech R, Hudson M. What does "access to health care" mean? Journal of Health Services Research and Policy 2002, 7(3): 186–188.
[23] Bazzoli, GJ, Gerland A, May J. Construction activity in US hospitals. Health Affairs 2006, 25(3): 783–791.
[24] Alhowaish AK. Healthcare spending and economic growth in Saudi Arabia: A Granger causality approach. International Journal of Scientific and Engineering Research 2014b, 5(1): 1471–1474
[25] Saudi Arabian Monetary Agency. The 50th annual report: The latest economic development. Research and Statistics Department. Riyadh, Saudi Arabia, SAMA Publication 2015. Available from: http://www.sama.gov.sa/
[26] World Health Organization. National health account database., 2015. Available from: http://data.worldbank.org/indicator/SH.XPD.TOTL.ZS
[27] Almalki M, Fitzgerald G, Clark M. Health care system in Saudi Arabia: An overview. Eastern Mediterranean Health Journal 2011, 17(10): 784–793.
[28] Ministry of Health. Healthcare strategic plan: 2010–2020. Riyadh, Saudi Arabia, MOH Publication 2010. Available from: http://www.moh.gov.sa/Portal/WhatsNew/Documents/OKIstragi260p.pdf
[29] Walston S, Al-Harbi Y, Al-Omar B. The changing face of

healthcare in Saudi Arabia, Ann Saudi Med 2008, 28(4): 243-250
[30] Hassan A. Saudi Arabian healthcare privatization process. Saudi Gazette May 15, 2016. Available from: http://english.alarabiya.net/en/business/economy/2016/05/15/Saudi-Arabia-to-privatize-295-hospitals.html
[31] The Economist. Transcript: Interview with Muhammad bin Salman. January 16, 2016. Available from: http://www.economist.com/saudi_interview
[32] United Nations. World population prospects. New York, UN Population Division, 2015.
[33] Abusaaq H. Population aging in Saudi Arabia. Saudi Arabian Monetary Agency publication, Riyadh, Saudi Arabia, 2015.
[34] Ministry of Health. 2030 Vision and MOH tasks. Riyadh, Saudi Arabia, MOH Publication, 2015 [in Arabic].
[35] Saudi Kuwaiti Finance House. Saudi Arabia healthcare "healthy living." Kuwait, KFH Research Ltd, 2014.
[36] Saudi Arabian General Investment Authority. National investment plan: Chapter 2: Healthcare, Riyadh, Saudi Arabia, 2016. Available from: http://sagia.gov.sa/en/NationalInitiatives/Council of Co-operative Health Insurance. Vision and tasks of the Council of

Table 1: Distribution of population, public and private hospital resources according to Saudi Regional classification in 1992 and 2014

Variables		Developed Regions		Developing Regions		Least Developed Regions	
		1992	2014	1992	2014	1992	2014
Population		64.2	65.9	23.8	23.0	12.0	11.2
Public sector							
(%)	Hospitals	42.0	44.8	35.1	31.9	23.0	23.3
	Beds	54.8	55.3	29.1	26.4	16.1	18.4
	Physicians	55.8	54.6	29.7	26.1	14.5	19.3
	Nurses	57.7	55.8	29.1	25.5	13.2	18.7
Beds per 1,000 people		1.4	1.1	1.9	1.5	2.1	2.1
Physicians per 10,000 people		5.0	6.7	7.1	9.3	7.9	14.0
Nurses per 10,000 people		13.0	19.1	17.6	25.1	15.9	37.7
Private sector							
(%)	Hospitals	82.7	73.8	13.3	22.7	4.0	3.5
	Beds	88.7	81.5	8.6	16.1	2.7	2.5
	Physicians	91.5	85.5	6.3	12.9	2.3	1.6
	Nurses	94.4	87.3	3.7	11.6	1.9	1.1
Beds per 1,000 people		0.6	0.7	0.2	0.3	0.1	0.1
Physicians per 10,000 people		2.6	4.4	0.5	1.9	0.3	0.5
Nurses per 10,000 people		6.4	9.6	0.7	3.7	0.6	0.7

Source: Ministry of Health, 1992 and 2004; General Authority for Statistics, 1992 and 2014, calculated by authors

Table 2: Distribution of population and public and private hospital beds, physicians, and nurses according to Saudi regions in 2014

Region	Population	Hospitals		Beds		Physicians		Nurses	
		Public	Private	Public	Private	Public	Private	Public	Private
Riyadh	7,717,467	47	34	7,937	4,554	5,555	2,890	14,762	6,541
Makkah	7,897,975	39	44	8,230	4,044	6,110	3,187	14,564	5,674
Jizan	1,533,496	21	3	2,050	250	1,428	94	3,297	135
Eastern Province	4,650,183	35	26	6,111	4,155	1,997	2,788	9,412	7,220
Aseer	2,145,733	27	12	3,050	837	1,820	404	4,591	772
Qassim	1,370,727	18	5	2,754	393	1,017	216	4,430	578
Hail	670,468	12	2	1,175	100	748	60	2,106	75
Madinah	2,012,749	20	12	2,768	1,035	2,270	625	5,426	1,094
Baha	461,360	10	1	1,125	100	746	34	1,358	54
Northern Border	359,297	8	0	1,010	0	678	0	1,941	0
Tabouk	887,383	11	1	1,170	86	931	36	2,560	81
Najran	568,631	10	1	1,150	100	840	35	2,166	39
Jouf	494,906	12	0	1,770	0	878	0	2,847	0
Total (Saudi Arabia)	30,770,375	270	141	40,300	15,654	25,018	10,369	69,460	22,263

Source: Ministry of Health, 2004; General Authority for Statistics, 2014

Table 3: Regression results of the spatial distribution of public and private hospital healthcare provision, 2014

Variables	Hospitals		Beds		Physicians		Nurses	
	Public	Private	Public	Private	Public	Private	Public	Private
	Coefficients							
Constant	10.105	-1.896	821.565	-297.271	376.637	-266.845	1262.326	-528.463
Population	0.000	0.000	0.001	0.001	0.001	0.000	0.002	0.001
	t Stat							

	6.749	-1.837	5.218	-1.503	1.974	-2.072	6.434	-1.230
	10.511	18.224	21.353	11.203	11.970	12.195	30.693	7.700
	P-value							
	0.000	0.093	0.000	0.161	0.074	0.063	0.000	0.244
	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Adj. R2	0.901	0.965	0.974	0.912	0.922	0.925	0.987	0.829
F-Stat	110.489	332.100	455.940	125.497	143.292	148.711	942.042	59.283
Sig. F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000