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Is Kuwait Overspending on its Healthcare System? Estimating the Optimal Healthcare Expenditure for Single-Payer Healthcare system Countries

Nouf S AlSaied[1], Nadia S AlAli[2], Musaed S AlAli[3]*

1 Head of Quality Indicator Program – Ministry of Health, KUWAIT

2 Consultant Endocrinologist, AlAmiri Hospital – Ministry of Health, KUWAIT

3 College of Business Studies - Department of Insurance and Banking – PAAET, KUWAIT

***Corresponding author:**
Musaed S AlAli

ms.alali@paaet.edu.kw

College of Business Studies, Department of Insurance and Banking, PAAET, KUWAIT

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Abstract

Despite being one of the most basic needs for any human being, not all countries provide free medical coverage to all their residents, in a matter of fact there are only 32 countries that follow such system which Kuwait is one of them. The universal government-funded health system, also known as single-payer healthcare, is a healthcare system where government funds all healthcare services to all citizens and non-citizens residence regardless of their income or employment status. Some countries may require non-citizens to buy private insurance that is partially subsidized by the government. The aim of this study is to evaluate the factors that mostly affects healthcare expenditure (HE) per capita and based on it estimate HE per capita and compare it to the actual HE per capita to find which countries overspend or underspend on their HE. Using OLS regression that is based on a panel data of 29 countries that follows single-payer healthcare system in 2019 where HE per capita is set as a dependent variable. Results revealed that HE as percentage of GDP, GDP per capita, number of physicians per 1000 persons, and number of hospital beds per 1000 persons all showed statistically significant direct relation with HE per capita while oddly percentage of people aged 65 and above showed a statistically significant inverse relation with HE per capita. Results also showed that corruption and life expectancy did not have any statistically significant relation with HE per capita. Running the estimation model revealed that 6 countries were in the acceptable range, ±5% from forecasted HE, while 12 countries showed overspending and 11 countries were underspending. Cuba showed that it was the most overspending country by +22.26% and Georgia was the most underspending country by -30.80% while Kuwait overspend by +9.90%.

Keywords: Healthcare expenditure (HE); Kuwait; Healthcare expenditure per Capita; Single-payer healthcare syste; corruption

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Introduction

Human capital is considered as one of the most important factors affecting the growth and prosperity of any economy. A country with healthy population would yield much more productivity than a country with population that suffers from illness [1]. For that, countries pay huge amount of attention to the health of their populations. The country with better healthcare system would outperform other countries with the same level of resources. Marginal yield concept still applies to healthcare, spending on healthcare would yield positive benefits to the country population but that marginal benefit would starts to deteriorate after a certain point or at least stays flat [2]. This would mean that countries should not overspend on their healthcare systems after a certain point since these funds would not improve their healthcare system rather they should direct these funds to other areas such as education and technology that also affects the health of the population [3]. Education, technological change, income and cultural differences have been identified as major drivers of health outcomes rather than healthcare spending. The effect of education on health was greater than that of public health spending whereas the effect of real per capita income on health was found to be weak [2]. Adding to it, World Bank (2004) report found that public health spending to be ineffective in promoting health status. Or (2001) also suggested that public health expenditure plays little or no role in improving health status. By the use of the data of Gulf Cooperation Council (GCC)

countries over the period 1980 to 2014, showed that there was a statistically significant negative effect of HE per capita on life expectancy but there was a positive relation with education [1]. The studied tell relation between GDP, HE, and life expectancy in developing countries over the period 1996 to 2006 and found that there was statistically significant direct relation between country GDP and HE but there wasn't any significant relation between HE and life expectancy [4].

On the other hand, Newhouse (1977) suggested that countries with a higher income level can afford to spend more on health. Furthermore, countries with a higher GDP per capita would probably have a better standard of living, which would affect life expectancy and for that income per capita is most relevant variable explaining HE. His findings were supported [5], where they found a statistically significant direct relation between GDP per capita and HE when examining the determinants of health care spending in Saudi Arabia over the period 1979 to 2013. In Canada, used data from Canada to assess the impact of healthcare spending on health outcomes measured by life expectancy and infant mortality [4]. Using per capita income, physician per 1000 person and other socio-economic factors, they found that healthcare spending was relevant for promoting health outcomes.

As death nears, individuals typically receive costly intensive medical services [6]. It is found that expenditures tend to increase considerably at older ages [3], as elderly people often require costly medical treatment, and that improving life expectancy would often lead to increases in HE [7]. It is estimated that elderlies in their final year of their lives have a medical cost seven time greater than normal persons [8,9]. On the opposite side, It is found that the expected cumulative health expenditures for healthier elderly persons, despite their greater longevity, are similar to those for less healthy persons [10].

Corruption can broadly be defined as "abusive use of power with the purpose of satisfying personal or group interests" [11,12]. Health being one of the most essential and basic needs of an individual makes it a lucrative target for corruption [13,14]. Health having unique dimensions is vulnerable to both economic and political influences and its corruption not only involves monetary incentives but also involves corruption of knowledge. With huge amount of funds allocated to healthcare services, it is a valuable target for corrupted healthcare sector employees, politicians, and even for patients [15]. As a result, it should be logical to assume a direct relation between corruption and HE and an inverse relation with health quality measured by life expectancy [16]. This assumption was confirmed by the study on GCC countries where he found a statistically direct relation between corruption and HE [1].

Methodology

In this study, natural log of HE per capita (Y) is set as a dependent variable and natural log of GDP per capita (X1), number of physicians' per 1000 (X2), number of hospital beds per 1000 (X3), natural log of life expectancy (X4), percentage of HE of GDP (X5), percentage of people aged 65 years and above (X6), and the natural log of corruption index (X7). The purpose of using natural log is to reduce the problem of heteroscedasticity. The OLS regression model used to estimate the HE per capita is as follows;

$$Y_t = \alpha_t + \beta_1 X1_t + \beta_2 X2_t + \beta_3 X3_t + \beta_4 X4_t + \beta_5 X5_t + \beta_6 X6_t + \beta_7 X7_t + \varepsilon \quad (1)$$

Where ε is the error term.

Data and Empirical Results

This research is based on the year 2019 data of 29 countries out of 32 countries, 3 countries were omitted from the research due to lack of data, that adapt single-payer healthcare system. The data used in this research were obtained from World Bank website and Transparency international website.

Descriptive analysis is presented in table 1, where it can be seen that the average HE per capita for the 29 countries was $3421.74 while it was $3669 for Kuwait. GDP per capita in Kuwait was $32000 which was equal to the average of the sample. Although Kuwait had above average for physicians per 1000 people, they were below average when it came to hospital beds per 1000 persons. While the WHO set a standard of minimum 3 hospital beds per 1000, Kuwait had only 2. Kuwait also showed that while the average of the sample spend 7.75% of their GDP on healthcare, Kuwait only allocates 5% of its GDP to it. While the percentage of people aged 65 and above represent 13.46% of the population, that percentage was only 2.76% in Kuwait and that is due to the high birth rate compared to other countries in the sample. Using kurtosis and skewness results to identify distribution normality of the data, it can be seen that both of them fall within the acceptable range of normal distribution since the data fall between ±3 and ±10 for skewness and kurtosis respectively [8] **(Table 1).**

Regression results are presented in table 2, where it can be seen that adjusted R-square was 0.9441 indicating that the independent variables used in the model were able to explain 94.41% of HE per capital **(Table 2).** The model also showed a

Table 1 Descriptive analysis.

	Y	X1	X2	X3	X4	X5	X6	X7
Mean	3421.738	32011.09	3.304068	2.922500	78.71185	0.077454	0.134583	61.17857
Median	3632.833	29651.00	3.356250	2.840000	80.94268	0.085685	0.153785	58.00000
Maximum	6646.713	78778.99	8.421800	5.330000	83.48537	0.111875	0.230121	87.00000
Minimum	517.0000	3853.084	0.526900	1.490000	64.13100	0.024129	0.023121	35.00000
Std. Dev.	1787.522	21840.70	1.798200	0.905500	4.690915	0.024698	0.071473	16.92260
Skewness	-0.037100	0.576536	0.859987	0.713285	-1.286408	-0.610090	-0.367197	0.193484
Kurtosis	1.756695	2.355589	4.073152	3.209580	4.512121	2.244236	1.706603	1.697394
Observations	29	29	29	29	29	29	29	29

Table 2: OLS Regression Output.

Dependent Variable: Y				
Method: Least Squares				
Date: 06/09/21 Time: 20:30				
Sample: 1 29				
Included observations: 29				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	-5.961326	4.140794	-1.439658	0.1654
X1	0.628285***	0.071344	8.806467	0.0000
X2	0.072785***	0.023321	3.121064	0.0054
X3	0.114758**	0.047681	2.406791	0.0259
X4	1.603103	1.032907	1.552031	0.1363
X5	14.50420***	2.151458	6.741569	0.0000
X6	-4.432748***	1.034725	-4.283984	0.0004
X7	-0.127056	0.179854	-0.706441	0.4881
R-squared	0.958558	Mean dependent var		7.953580
Adjusted R-squared	0.944053	S.D. dependent var		0.684173
S.E. of regression	0.161828	Akaike info criterion		-0.569611
Sum squared resid	0.523765	Schwarz criterion		-0.188981
Log likelihood	15.97455	Hannan-Quinn criter.		-0.453249
F-statistic	66.08593	Durbin-Watson stat		1.703809
Prob(F-statistic)	0.000000			
*,**,*** indicate confidence levels at 90%, 95%, and 99% respectively				

Table 3 Over and Underspending Countries.

Overspending (Above 5%)		Within ±5%		Underspending (below 5%)	
Cuba	22.26%	Sweden	4.22%	New Zealand	-5.23%
Saudi Arabia	16.18%	Denmark	2.39%	Greece	-7.23%
Malaysia	15.57%	Canada	-0.58%	Brunei	-7.46%
Italy	14.13%	South Africa	-0.94%	Bhutan	-8.66%
Botswana	12.38%	Ireland	-3.06%	Sri Lanka	-9.75%
Portugal	10.80%	Bahrain	-3.44%	Trinidad and Tobago	-11.37%
Kuwait	9.90%			Norway	-12.90%
United Kingdom	9.51%			Australia	-24.91%
Finland	8.86%			Iceland	-27.23%
Malta	8.40%			Brazil	-29.83%
Oman	7.19%			Georgia	-30.80%
Spain	6.21%				

prob of F-statistic of 0.00 which indicates that the model can be labeled as a "good fit". It can also be seen from the table that GDP per capita, physicians per 1000, hospital beds per 1000, and HE as percentage of GDP all showed a statistically significant direct relation with HE expenditure at the 99% confidence level except for hospital beds per 1000 that was at the 95% confidence level. On the other side, despite the fact that older people need more healthcare, the percentage of people aged 65 and above showed statistically significant inverse relation with HE per capita at the 99% confidence level. Although life expectancy showed a direct relation with HE per capita, that relation was statistically insignificant. Since this research uses Corruption Perceptions Index (CPI) which gives a higher score to least corrupted countries, having a negative coefficient would actually means direct relation between corruption and HE per patient. So in the results this would mean that there was a direct relation between corruption and HE per patient but that relation was statistically insignificant.

By plotting the coefficients from table 2 into equation 1, the forecasting model would read as;

$$\hat{Y} = -5.961 + 0.628\,(X1) + 0.073(X2) + 0.115(X3) + 1.603(X4) + 14.504(X5) - 4.433(X6) - 0.127(X7) \quad (2)$$

Where $\hat{Y}$ is the estimated HE per capita. In determining whether or not a country over or underspend on its healthcare system, equation 3 is used where a country is considered overspending when the actual HE per capita is higher than the estimated number and vice versa.

$$Over\ or\ underspending = Actual\ HE\ per\ capita - \exp \hat{Y} \quad (3)$$

Results of applying the data of the 29 countries into equations 2 and 3 are presented in table 3. The outcome shows that 12 countries overspend on their healthcare systems where Cuba overspend by 22.26% followed by Saudi Arabia at 16.18%. On the flipside, there were 11 countries that illustrated underfunding in their healthcare systems, where Georgia healthcare system was the most underfunded by -30.80%. Only 6 countries were able to achieve somewhat actual HE per capita that is within ±5% of the estimated expenditure where Canada was the closest country to the estimated number. Kuwait was the seventh highest overspending country on their HE per capita by +9.90% (Table 3).

Conclusion

Having a healthy population is crucial to the growth and prosperity of any country. Spending more on healthcare does not necessarily means better health outcome, many researchers see that other aspects such as better education and technological improvements can also enhance the health status of the population. Results from this research show that 12 countries, out 29 countries that adapt single-payer healthcare system, were overspending on their healthcare systems. The research also shows that Kuwait overspend on its healthcare system by +9.90% suggesting that Kuwait is better off reducing its healthcare budget by 9.90% and allocate the funds to other areas such as education that have direct effect on the overall health of its population.

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