



Journal of Health and Medical Sciences

AlSaied, Nouf S., and AlAli, Musaed S. (2021), Does Spending More on Healthcare Yields Higher Life Expectancy? A Case Study on Gulf Cooperation Council Countries. In: *Journal of Health and Medical Sciences*, Vol.4, No.3, 109-113.

ISSN 2622-7258

DOI: 10.31014/aior.1994.04.03.185

The online version of this article can be found at:
<https://www.asianinstituteofresearch.org/>

Published by:
The Asian Institute of Research

The *Journal of Health and Medical Sciences* is an Open Access publication. It may be read, copied, and distributed free of charge according to the conditions of the Creative Commons Attribution 4.0 International license.

The Asian Institute of Research *Journal of Health and Medical Sciences* is a peer-reviewed International Journal. The journal covers scholarly articles in the fields of Medicine and Public Health, including medicine, surgery, ophthalmology, gynecology and obstetrics, psychiatry, anesthesia, pediatrics, orthopedics, microbiology, pathology and laboratory medicine, medical education, research methodology, forensic medicine, medical ethics, community medicine, public health, community health, behavioral health, health policy, health service, health education, health economics, medical ethics, health protection, environmental health, and equity in health. As the journal is Open Access, it ensures high visibility and the increase of citations for all research articles published. The *Journal of Health and Medical Sciences* aims to facilitate scholarly work on recent theoretical and practical aspects of Health and Medical Sciences.



ASIAN INSTITUTE OF RESEARCH
Connecting Scholars Worldwide

Does Spending More on Healthcare Yields Higher Life Expectancy? A Case Study on Gulf Cooperation Council Countries

Nouf S. AlSaied¹, Musaed S. AlAli²

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

² Department of Insurance and Banking, College of Business Studies, The Public Institute of Applied Education and Training (PAAET), KUWAIT

Correspondence: Musaed S. AlAli. Email: ms.alali@paaet.edu.kw

Abstract

This study aims to evaluate the nexus between economic factors and life expectancy in Gulf Cooperation Council (GCC) countries. Using the data of 115 countries for the year 2019, results revealed that only healthcare expenditure (HE) per capita showed statistically significant direct relation with life expectancy while GDP per capita and percentage of country GDP allocated to healthcare sector did not show any statistically significant effect. Based on panel OLS regression model used in this research, results showed that with the amount of money GCC countries spend on their healthcare systems, four out of the six GCC countries had a life expectancy that was lower than the estimated life expectancy by 3.28 years indicating inefficiency in their healthcare systems. The output also indicates that even though economic factors have an effect on life expectancy to a certain point, other factors such as the quality of the healthcare system staff, education, corruption, pollution, and other non-economic factors also affect life expectancy.

Keywords: Gulf Cooperation Council (GCC), Life Expectancy, Healthcare Expenditure (HE), Panel OLS Regression, Healthcare System Efficiency

Introduction

The health status of the population has always been associated with economic growth and prosperity of any nation. Novignon et al. (2012) showed that population poor health status has significant negative influence on economic growth. Life expectancy is widely used as an indicator of the health status of the population and the overall development of a country. Ngangue and Manfred (2015) used the data of 141 countries over the period 2000-2013 and concluded that the improvement in life expectancy showed positive affect on economic growth. Life expectancy is not only influenced by economic factors but it is also influenced by other factors such as environmental and social factors as concluded by Lleras-Muney and Sherry (2008) and Boachie and Ramu (2016). This research focuses on the effect of the economic factors on life expectancy in GCC countries. The GCC is a

council that is made of 6 oil-rich countries (Kuwait, Bahrain, Saudi Arabia, Qatar, Oman, and United Arab Emirates) that was formed in 1981. These countries pay huge amounts of attention to their healthcare systems and back them up with the financial support they need. The question of this research is whether or not that financial support is spent efficiently and does it really increase life expectancy in these countries.

Previous literature showed conflicted results when it came to the effect of HE per capita on life expectancy, for example Jaba et al. (2014) using the data of 175 countries found positive association between life expectancy and HE per capita. Deshpande et al. (2014) showed mixed results when studying the data of 181 countries where they did not find any significant correlation between HE per capita and life expectancy in developing countries, but that relation did exist in developed countries. While on the other hand, Kaufmann et al. (2003) did not find any statistical validations that considerably increase in investments in healthcare have any significant influence on the indicators of population health and life expectancy.

While many researchers associate healthcare expenditure as a percentage of country GDP with HE per capita, that relation tends to be weak. Countries that allocate large portion of their GDP to their healthcare sector but have large population sizes and low GDP would most likely have lower HE per capita than a country with large GDP and small population size. Healthcare expenditure as a percentage of GDP, might not give a clear picture regarding the amount of money paid to that sector but it gives an indication to the amount of attention the government pays to its healthcare sector. Linden and Ray (2017) examined the effect of healthcare expenditure as a percentage of GDP on life expectancy for 34 OECD countries over the period 1970 to 2012 and concluded that a direct relation exists between them does exist. Mahumud et al. (2013) analyzed data from Bangladesh during the period 1995 to 2011 and found that healthcare expenditure as a percentage of GDP had a statistically significant direct relation with life expectancy.

High income individuals can afford getting better healthcare services and thus would be expected to live longer than lower income people. It has been observed that there is a strong direct relationship between the level of income, measured by GDP per capita, and life expectancy among the poor countries (World Bank, 1993). Chetty et al. (2016) used U.S. data over the period 2001 to 2014 to examine the relation between income and life expectancy and found that income was positively correlated with greater life expectancy. On the other hand, Rogers (1979) provided a conceptual framework of the relationship between income and life expectancy and concluded that life expectancy rises at a declining rate as income grows. Wilkinson (1996) set a threshold income level of \$5000-\$10000 where the direct relation between income and life expectancy does exist below the threshold but fades above it. Sen (1999) questioned the validity of that relation where he found that the Indian state of Kerala has achieved impressively high life expectancy despite its low per capita income.

Methodology

This research is set to examine the effect of economic factors which are GDP per capita, HE per capita and HE as a percentage of GDP on life expectancy. In examining this relation OLS regression is used as shown in equation 1;

$$Life\ Exp = \alpha + \beta_1 GDP\ Per\ Capita + \beta_2 HE\ Per\ Capita + \beta_3 \%GDP + \varepsilon \quad (1)$$

Data and Empirical Results

Results of this research are based on a panel data of 115 countries for the year 2019, where the countries in the sample are shown in table 1. The data of this research were obtained from World Bank web site.

Table 1: Sample Countries

| | | | | |
|-----------|------------|---------|------------|-------------|
| Kuwait | Cuba | Tunisia | Mozambique | Singapore |
| Argentina | Cyprus | Iraq | Malaysia | El Salvador |
| Armenia | Czech Rep. | Iceland | Nigeria | Serbia |
| Australia | Germany | Israel | Nicaragua | Slovak Rep. |

| | | | | |
|------------------------|----------------|----------------------|--------------|--------------------|
| Austria | Denmark | Italy | Netherlands | Slovenia |
| Azerbaijan | Algeria | Jamaica | Norway | Sweden |
| Belgium | Ecuador | Jordan | Nepal | Seychelles |
| Bangladesh | Egypt | Japan | New Zealand | Chad |
| Bulgaria | Spain | Kazakhstan | Oman | Thailand |
| Bahrain | Estonia | Kenya | Pakistan | Tajikistan |
| Bahamas | Finland | Korea, Rep. | Peru | Turkmenistan |
| Bosnia and Herzegovina | United Kingdom | United Arab Emirates | Philippines | Iran, Islamic Rep. |
| Bolivia | France | Lebanon | Poland | Turkey |
| Brazil | Fiji | Sri Lanka | Portugal | Tanzania |
| Brunei | Georgia | Lithuania | Paraguay | Uganda |
| Bhutan | Ghana | Luxembourg | Qatar | Ukraine |
| Canada | Greece | Latvia | Romania | Uruguay |
| Switzerland | Honduras | Morocco | Russian Fed. | United States |
| Chile | Croatia | Mexico | Rwanda | Uzbekistan |
| China | Hungary | Mali | South Asia | Vietnam |
| Cameroon | Indonesia | Malta | Saudi Arabia | South Africa |
| Colombia | India | Montenegro | Sudan | Zambia |
| Costa Rica | Ireland | Mongolia | Senegal | Zimbabwe |

Descriptive analysis is presented in table 2, where it can be seen that average life expectancy for the countries under study was 75.18 years with standard error of ± 0.60 years. The mean GDP per capita was \$19314.13 and those countries spend on average %6.73 of their GDP on their healthcare systems. It can also be seen that both Kurtosis and skewness were within the acceptable normal distribution range of ± 10 and ± 3 respectively.

Table 2: Descriptive Analysis

| | <i>Life Exp</i> | <i>GDP Per Capita</i> | <i>HE Per Capita</i> | <i>% GDP</i> |
|----------------|-----------------|-----------------------|----------------------|--------------|
| Mean | 75.18 | 19314.13 | 2061.60 | 6.73 |
| Standard Error | 0.60 | 2075.30 | 190.21 | 0.24 |
| Median | 76.16 | 9126.56 | 1336.53 | 6.69 |
| Kurtosis | 0.99 | 2.71 | 2.16 | 0.66 |
| Skewness | -1.03 | 1.64 | 1.44 | 0.52 |
| Minimum | 54.24 | 441.51 | 79.01 | 1.60 |
| Maximum | 84.36 | 114685.17 | 10623.85 | 16.89 |
| Count | 115 | 115 | 115 | 115 |

A comparison between the factors means for the countries under study and GCC countries is presented in table 3. It can be seen from the table that five GCC countries had a life expectancy that was above the mean of the sample except for Saudi Arabia that was below even though Saudi Arabia had a higher GDP per capita and HE per capita than the mean of the sample. GCC countries are major players in the global oil and natural gas markets and for that it can be seen that their GDP per capita is higher than the mean of the sample countries except for Oman since it does not export much oil as the rest of the GCC countries. When it comes to HE per capita, it can be seen that both Bahrain and Oman fell below the sample average. Even though the percentage of GDP allocated to the healthcare sector does not give a clear picture of the actual amount of money spend on the healthcare sector, it sheds some light on the importance of that sector to the government. Governments that gives high priority to their healthcare sector would usually allocate higher percentage of their budget to that sector. Oman had the highest percentage of their GDP allocated to their healthcare sector among the GCC countries and was the only one that was above the sample average.

Table 3: Mean Comparison

| | <i>Life Exp</i> | <i>GDP Per Capita</i> | <i>HE Per Capita</i> | <i>% GDP</i> |
|----------------------|-----------------|-----------------------|----------------------|--------------|
| Sample Mean | 75.18 | 19314.13 | 2061.60 | 6.73 |
| United Arab Emirates | 77.97 | 43103.32 | 3172.61 | 4.23 |
| Bahrain | 77.29 | 23503.98 | 1955.35 | 4.13 |
| Kuwait | 75.49 | 32000.45 | 3669.02 | 5.00 |
| Oman | 77.86 | 15343.06 | 1729.54 | 9.21 |
| Qatar | 80.23 | 62088.06 | 3165.86 | 6.65 |
| Saudi Arabia | 75.13 | 23139.80 | 3519.91 | 6.36 |

The OLS regression results are presented in table 4, where it can be seen that the model showed an adjusted R square of 0.721 indicating that the economic variables used in this research were able to explain 72.1% of the variation in life expectancy while the remaining 27.9% are related to other factors such as education, technological advancement, pollution, and other factors. The model can also be labeled as a “Good Fit” since the *F-sig* was almost 0. The results showed that only HE per capita had a statistically significant direct effect on life expectancy which supports Jaba et al. (2014) findings. While Chetty et al. (2016) found significant direct relation between GDP per capita and life expectancy, results from this research contradicts their findings and support Sen (1999) findings especially since all GCC countries had a GDP per capita that exceeds the threshold of \$10000 set by Wilkinson (1996). The results also opposes Mahumud et al. (2013) and Linden and Ray (2017) findings that percentage of GDP allocated to the healthcare sector significantly affects life expectancy.

Table 4: OLS Regression Output

| <i>Regression Statistics</i> | | | | |
|------------------------------|---------------------|-----------------------|---------------|-----------------------|
| Multiple R | 0.854 | | <i>F</i> | <i>Significance F</i> |
| R Square | 0.729 | | 99.348 | 2.64E-31 |
| Adjusted R Square | 0.721 | | | |
| Standard Error | 0.048 | | | |
| Observations | 115 | | | |
| | <i>Coefficients</i> | <i>Standard Error</i> | <i>t Stat</i> | <i>P-value</i> |
| Intercept | 3.864 | 0.032 | 119.880 | 0.000 |
| GDP Per Capita | -0.002 | 0.013 | -0.141 | 0.888 |
| HE Per Capita | 0.067 | 0.016 | 4.320 | 0.000 |
| % GDP | -0.064 | 0.233 | -0.274 | 0.784 |

By plotting the coefficients generates from the OLS regression in equation 1, the forecasted life expectancy can be estimated using equation 2 as follows;

$$\widehat{Life\ Exp} = 3.863 + (-0.002 * GDP\ Per\ Capita) + (0.067 * HE\ Per\ Capita) + (-0.064 * \%GDP) \quad (2)$$

Where $\widehat{Life\ Exp}$ is the estimated life expectancy based on the economic inputs for each country. By looking at table 5, it can be seen that United Arab Emirates, Bahrain, Kuwait, and Saudi Arabia should have a higher life expectancy based on their economic factors and the amount of money they spend on their healthcare systems. Based on the personal income and the amount of money Saudi government spend on its healthcare system, the estimated life expectancy in Saudi Arabia should be 80.58 years but the actual life expectancy is 75.13 years meaning that the money allocated to the healthcare sector is not utilized efficiently. The same thing can be said about Kuwait where there was a 5.34 years difference between the average life expectancy and projected life expectancy. Despite having the lowest GDP per capita and HE per capita, Oman showed life expectancy that was higher than the forecasted one indicating efficiency in their healthcare system compared to other GCC countries.

Table 5: Projected Life Expectancy

| | Forecasted Life Exp | Life Expectancy | Difference | % Difference |
|----------------------|---------------------|-----------------|------------|--------------|
| United Arab Emirates | 80.04 | 77.97 | -2.07 | -2.65% |
| Bahrain | 77.58 | 77.29 | -0.28 | -0.37% |
| Kuwait | 80.83 | 75.49 | -5.34 | -7.07% |
| Oman | 76.75 | 77.86 | 1.11 | 1.43% |
| Qatar | 79.85 | 80.23 | 0.37 | 0.47% |
| Saudi Arabia | 80.58 | 75.13 | -5.44 | -7.25% |

Conclusion

This research was set to examine the effect of economic factors on life expectancy and estimate what life expectancy should be in GCC countries. Using panel data of 115 countries for the year 2019, results revealed that HE per capita was the only factor that had a statistically significant direct relation with life expectancy. Using the economic factors examined in this research to estimate what life expectancy should be in GCC countries, results showed that four out of the six GCC countries had a life expectancy that was lower than the projected one indicating that the healthcare sectors in these four countries are not fully utilizing the resources provided to them by their governments.

References

- Boachie, M. and Ramu, K. (2016). Effect of public health expenditure on health status in Ghana. *International Journal of Health*, 4(1), 6-11.
- Chetty, R., Stepner, M., Abraham, S., Lin, S., Scuderi, B., Turner, N., Bergeron, A., and Cutler, D. (2016). The Association between Income and Life Expectancy in the United States, 2001-2014. *JAMA*, 315(16), 1750–1766. <https://doi.org/10.1001/jama.2016.4226>
- Deshpande, N., Kumar, A. and Ramawami R. (2014). The Effect of National Healthcare Expenditure on Life Expectancy. Georgia Institute of Technology, available at <https://smartech.gatech.edu/bitstream/handle/1853/51648/The+Effect+of+National+Healthcare+Expenditure+on+Life+Expectancy.pdf;jsessionid=AE5D19255A0CB9474AFECD086C5D1297.smartech?sequence=1>
- Jaba, E., Baln, C.B., and Robu, I.B. (2014). The Relationship between Life Expectancy at Birth and Health Expenditures Estimated by a Cross-country and Time-series Analysis. *Procedia Economics and Finance*. 15(2), 108–114. [https://doi.org/10.1016/S2212-5671\(14\)00454-7](https://doi.org/10.1016/S2212-5671(14)00454-7)
- Kaufmann, D., Kraay, A. and Mastruzzi, M. (2003). Governance matters: governance indicators for 1996–2002. *World Bank policy research department*, Working Paper No. 3106.
- Linden, M. and Ray, D. (2017). Life expectancy effects of public and private health expenditures in OECD countries 1970–2012: Panel time series approach. *Economic Analysis and Policy*, 56, 101-113. <http://dx.doi.org/10.1016/j.eap.2017.06.005>
- Lleras-Muney, A., and Sherry, G. (2008). Health Inequality. *Education and Medical Innovation. Demography*, 45(3), 741–761.
- Mahumud, R. A., Hossain, G., Hossain, R., Islam, N., and Rawal, L. (2013). Impact of Life Expectancy on Economics Growth and Health Care Expenditures in Bangladesh. *Universal Journal of Public Health*, 1(4), 180-186.
- Ngangue, N., & Manfred, K. (2015). The impact of life expectancy on economic growth in developing countries. *Asian Economic and Financial Review*, 5(4), 653-660.
- Novignon, J., Olakojo, S.A. and Nonvignon, J. (2012). The Effects of Public and Private Health Care Expenditure on Health Status in Sub-Saharan Africa, New Evidence from Panel Data Analysis. *Health Economics Review*, 2(1), 1–8. <https://doi.org/10.1186/2191-1991-2-22>
- Rogers, G.B. (1979). Income and inequality as determinants of mortality: an international cross-section analysis. *Population Studies*, 33(3), 343-351.
- Sen, A. (1999). *Development as Freedom*, Alfred A Knopf, New York.
- Wilkinson, RG (1996). *Unhealthy Societies: The Afflictions of Inequality*, Routledge, London.
- World Bank (1993). *World Development Report 1993: Investing in Health*. Available at: <https://openknowledge.worldbank.org/handle/10986/5976>