



## The relationship between health expenditures and human development index

Zahra Mirahsani<sup>1</sup>

*Journal of Research & Health*  
Social Development & Health Promotion  
Research Center  
Vol. 6, No. 3, Jul & Aug 2016  
Pages: 373- 377  
DOI: 10.7508/jrh.2016.03.011  
Brief Article

1. **Correspondence to:** Department of Development Economic, Faculty of Economic, Tarbiat Modares University, Tehran, Iran  
Email: z.mirahsani@modares.ac.ir

Received: 22 Apr 2013  
Accepted: 8 Sep 2013

How to cite this article: Mirahsani Z. The relationship between health expenditures and human development index. *J Research & Health* 2016; 6(3): 373- 377.

### Abstract

Growth in gross domestic product does not necessarily mean growth in human development; experience in global level demonstrated that income growth and human development are not always companions and in some countries, an increase in one of them was took place with a decrease in the other. On the other hand, a study has found that as government health expenditures grow the efficiency of such expenditures fall. Taking into account the above as the main concern, this paper hypothesizes and tests a positive relationship between expenditures states allocate to health and human development index. The model, human development index is considered as endogenous variable and total health expenditures are taken as descriptive variable. Estimation of the hypothesized relationship is carried out using countries combined data from 2000-2008, extracted from Iranian government's "2025 Horizon" document. Results suggest that health expenditures growth in these countries has led to increased human development index

**Keywords:** Countries, Health Expenditures, Human Development

### Introduction

New definitions of development in the sense of human development pay attention to health more than ever. The reason is that health indicates the formation of human capabilities that introduce the primary dimension of human development. Generally, human development has two dimensions: formation of human capabilities, such as health and higher knowledge and skill; and people's use of these capabilities in leisure time, following the constructive goals, and doing social, cultural, and political activities. If the human development cannot balance these

two dimensions, human life is likely to decline at a high level. Therefore, the development must imply a sense beyond mere increases in wealth, and human should be set in the center and the process channel of development [1]. As shown above, new definitions emphasize on health promotion, and promotion of health index is a basic matter that receives attention in discussions of human development. Furthermore, studies show that the ratio of health expenditure in the gross domestic product (GDP) of developed countries is higher

than that in developing countries. In other words, the importance of human health would increase with the level of development of countries. In this respect, this study investigated the fundamental question that how the health expenditure correlated with the human developmental index as a newer index for measurement of countries' levels of development; whether there was a strong correlation between health expenditure and human development; and whether the increased health expenditure resulted in an increase in human developmental index or, in other words, whether higher health expenditure led to higher human development.

**Method**

This study examined the correlation between health expenditure as a ratio of GDP and Human Development Index (HDI) using consolidated data (panel) in 25 southwest Asian countries in 2000-2008. To introduce the instructions for estimating the panel data regression model, section (countries) and time (studied years) variables were defined in Stata software.

It should be noted that the studied southwest Asian region in the 20-year vision statement consisted of 25 countries in Persian Gulf region (Saudi Arabia, United Arab Emirates, Kuwait, Qatar, Oman, Bahrain, and Yemen), small Middle East (Iran, Iraq, Syria, Egypt, Turkey, Cyprus, Palestine, and Israel), Central Asia (Turkmenistan, Uzbekistan, Tajikistan, Kazakhstan, and Kyrgyzstan), Caucasus (Azerbaijan, Armenia and Georgia), and the Indian subcontinent (Afghanistan and Pakistan) [2].

It must be mentioned that Iraq was eliminated from economical tables because its economic statistics were not available. There was a similar problem with Palestine.

In this section, the panel data were estimated as consolidated observations performed on the sectional data related to the southwest Asian countries in 2000-2008 in order to examine the correlation between health expenditure and HDI.

To explain the studied variables in the model, HDI and total health expenditure were respectively considered as the endogenous variable and explanatory variable. Therefore, the regression model was follows:

In the above equation,  $\beta_{1it}$  is the intercept parameter and shows fixed effects or individual characteristics in each sectional unit. At first, simple Ordinary Least Squares (OLS) hypothesis testing method was tested as a  $H_0$  overlapping  $H_a$  against panel data regression model. The hypothesis can be shown as follows:

Once the data were defined as panel data in the software, it was necessary to report descriptive statistics of the model's variables. The results showed that the studied model was panel.

In the above hypothesis testing, the null hypothesis denoted the homogeneity of the individual effects of countries or individual units, whilst, the opposite hypothesis indicated the heterogeneity among individual units. An F-test with the following equation was used to test the above hypothesis:

$$F = \frac{(SSE_R - SSE_U) / J}{SSE_U / (NT - K)}$$

In the above equation,  $SSE_R$  is the sum of squared errors for the pooling model;  $SSE_U$  is the sum of squares sentences for the non-pooling model (the estimated model with fixed effects);  $NT$  is the total number of observations;  $K$  is the number of estimated parameters; and  $J$  is the number of constraints or  $n-1$  [3].

The results showed the null hypothesis introducing the use of ordinary least squares technique was rejected, and Hausman test was used to test the fixed versus random feature of variables.

In this part, Hausman sample function tested the null hypothesis of the panel data with random effects against the panel data with fixed effects and determined the truth of random effects against fixed effects. The value of the Wald sample function was greater than the chi-squared quantile of the statistic table. Therefore, the null hypothesis stating the truth of random effect was rejected. The fixed effect was used in the test. [4]

**Results**

The statistics obtained from World Health Organization (WHO) and HDI of the studied countries were estimated using the mentioned method. The results showed the positive

effect of increased health expenditure on HDI in southwest Asian countries. Regarding the significance of the effect of increased health expenditure on HDI, the increase in health expenditure in these countries can be emphasized as an important influential factor in development of these countries.

The health expenditure in the studied countries and period correlated with HDI positively. In other words, the increase in health expenditure in the studied countries resulted in promotion of HDI.

### Discussion

The comparison of health expenditures of the southwest Asian countries showed that maximum and minimum health expenditure belonged to Israel and Afghanistan, respectively. After Israel, highest health expenditures were respectively related to United Arab Emirates, Qatar, Cyprus, Kuwait, and Bahrain, which subsequently experienced favorable HDI. The lowest health expenditures were related to Afghanistan, Pakistan, Tajikistan, Yemen, Kyrgyzstan, Uzbekistan, Turkmenistan, and Syria, which enjoyed the lowest ranks of HDI. Among other 24 countries of the studied region, Iran had the tenth rank of health expenditure that comprised one third of the health expenditure of the first country.

If Iran was compared with oil-producing countries of the region, it would comprise

even a lower rank because countries with oil income spend considerable expenses on health, whilst, Iran does not emphasize the health sector favorably. For instance, mean health expenditure in United Arab Emirates, Qatar, Bahrain, Arabia, and Kuwait is \$1528 at purchasing power parity (PPP) per capita, whilst, Iran spends \$728 per capita. This shows that oil-producing countries averagely spend on health expenditure per capita twice as that in Iran. According to the table, Iran does not have a favorable rank among the region countries. However, making plans and applying appropriate policies can promote the rank of Iran in compliance with the objectives of the vision statement.

Iran's HDI in 2011 was 0.707 that belonged to the group with high index and assigned the 88th rank to Iran among 187 countries and the region countries. The HDI in Iran in 1980-2011 increased from 0.437 to 0.707, which revealed the total growth by 62% and mean annual growth by 1.6%. Based on the data and calculation method of 2011, Iran's rank in 2010 would be 87 out of 187 countries. Whereas, based on the data and calculation method of 2010, the rank was 70 out of 169 countries. However, it is not appropriate to compare ranks and values of different years because data, calculation methods, and number of studied countries change frequently [4,5].

**Table 1** List of countries by Human Development Index, 2011

Country	HDI rank
Very high human development countries	31
High human development countries	78
Iran	88
Medium human development countries	119
Low human development countries	157

Source: UNDP, 2013

In UNDP's classification, countries are divided into four categories: countries with very high HDI, countries with high HDI, countries with medium HDI, and countries with low HDI. In this classification, among the southwest Asian countries, maximum and minimum HDI belonged to Israel and Afghanistan, respectively. Among those countries, Iran has

the 1<sup>th</sup> rank (and 88th rank in the world) with HDI of 0.707, life expectancy at birth of 73 years, mean schooling years of 7.3, mean expected schooling years of 12.7, and Gross National Income (GNI) per capita of 10164. The important point is that countries with oil and gas reserves, such as United Arab Emirates, Qatar, Bahrain, Saudi Arabia,

and Kuwait, all have HDI higher than that of Iran, and Iran's HDI rank is even lower than that of Kazakhstan, Georgia, and Armenia. As described in the method calculating the HDI, GDP is a measurement index of the composite index and thus can highly contribute to increase HDI in countries where sales and exports of oil and gas comprise a great ratio of GDP. Therefore, it is appropriate to compare the oil-producing countries with one another, and as mentioned before, Iran did not gain a favorable rank and may even be degraded after the decline of oil reserves if long-term goals, maintenance, and development of Iran are considered.

The analysis of mean schooling years, and mean expected schooling years is another point that should be considered in HDI. These two indexes, which constitute the education index, in Iran are even lower than those in countries with HDI lower than that of Iran. The very high GDP of Iran against that of countries that are after Iran in HDI table has kept Iran at a higher rank, which has arisen from high sales of oil, as mentioned before.

There is a promising index in Iran; the life expectancy in Iran is 73 years that showed a favorable status among other countries in the region. Furthermore, the index's growth in the studied years in Iran was desirable.

There was a positive correlation between health expenditure and HDI in studied countries and years. In other words, the increase in health expenditure of these countries resulted in promotion of HDI.

Based on the investigations of this study and recommendations for future studies, it seems necessary to mention that the increase in health expenditure alone cannot improve health indexes. Therefore, policy makers in the health sector should always make appropriate policies and implement them in order to increase the efficiency of the expenditure. The development of public insurances, promotion of lifestyle, organizational modifications, and paying more attention to preventive measures are items increasing the efficiency of the health expenditure. The recommendation in this regard is to examine the indexes existing in the health

sector partially and rank the effect of these indexes on increased HDI. Moreover, these indexes should be compared at the level of country. Examples of such indexes include the expenses spent on health by the government, expenses spent on health by the private sector, foreign resources for health, expenses spent on health by the social security, and so forth.

### Conclusion

As stated in the section Theoretical and Experimental Literature, in recent years, economic theorists in the world introduce the human as the source of development, and modern growth theories rely on humans. It implies that they find the investment on physical and intellectual aspects of humans the most reliable condition for moving toward optimum economic development. Therefore, international organizations do not use GDP alone any longer to analyze the economic condition of different countries. Today, human development is the most modern criterion that determines the position of each country in the United Nations' table, and HDI and its growth rate play a significant role in preparing the countries for being active in the world's economy.

Regarding the objectives intended in the vision statement, Iran is supposed to reach the first rank in the region. In this respect, the scope of this study involved the health expenditure and HDI data of southwest Asian countries. The question was that whether higher health expenditure led to higher level of health, health indexes, and human development. In this respect, the health expenditure in the studied countries and its effect on the development of those countries were examined using the values and statistics provided by WHO and the Human development organization.

The comparison of health expenditures of the southwest Asian countries showed that countries with higher health expenditure experienced favorable HDI, and countries with lower health expenditure enjoyed the lowest ranks of HDI. Among other 24 countries of the studied region, Iran had the tenth rank of

health expenditure that comprised one third of the health expenditure of the first country in the region.

If Iran was compared with oil-producing countries of the region, it would comprise even a lower rank because countries with oil income spend considerable expenses on health, whilst, Iran does not emphasize the health sector favorably. A more detailed comparison showed that oil-producing countries averagely spend on health expenditure per capita twice as that in Iran.

In UN's classification, among the southwest Asian countries, Iran has the 11th rank (and 88th rank in the world) with HDI of 0.707, life expectancy at birth of 73 years; mean schooling years of 7.3, mean expected schooling years of 12.7, and GNI per capita of 10164 in 2011.

### **Acknowledgments**

Health Economics teachers of the Tarbiat Modares University are appreciated for their contribution to this study.

### **Contribution**

Study design: Zahra Mirahsani

Data collection and analysis: Zahra Mirahsani

Manuscript preparation: Zahra Mirahsani

### **Conflict of Interest**

"The author declare that they have no competing interests."

### **Funding**

The author (s) received no financial support for the research, authorship and/or publication of this article.

### **References**

- 1- Azkia M, Ghafari G. Development sociology. Tehran: Keihan publishing institute; 1998.
- 2- Rezaei Myrghaed M, Mobini Dehkordi A. Iran's future prospects on the Horizon. Tehran: Ministry of culture and islamic guidance; 2006.
- 3- Mohamadzadeh M. Stata in econometrics, Iran. Tehran: Nure elm publication; 2010.
- 4- Tahmasebi Torshizi J. Human development index and rank of Iran in the world. Tehran: Center for strategic research; 2013.

- 5- Keshavarz Haddad Gh. Econometrics. [dissertation] Tehran: Sharif University 2012; PP: 120-38.