DETERMINATION OF THE RELATIONSHIP BETWEEN POVERTY AND HEALTH INEQUALITY[1]

Arzu KURŞUN[∗]

Öz

Son yirmi yıl içinde, ülkelerin çoğu ekonomik istikrar, yoksulluk ve eşitsizliğin olası etkileri ile birlikte politik ve ekonomik sistemleri içinde mortgage gibi küresel krizler yaşamıştır. Bu çalışmada, 2011 yılından toplanan WHO verileri kullanarak dinamik bir bağlamda yoksulluk ve sağlık eşitsizliği incelenmiştir. Fakir ülkeler ve gelişmiş ülkeler arasındaki yoksulluk durumunu anlayabilmek adına kişi başına düşen sağlık harcaması ile beklenen yaşam süresi arasındaki ilişki son derece önemlidir. Sağlığın dinamiklerine odaklanırken, birçok sağlık göstergesi karşımıza çıkmaktadır. Örneğin; bebek ölüm hızı, hastane yatak sayısı gibi. Bu göstergeler ülkelerin ekonomik gücünü kavramamıza katkı sağlarlar. Şaşırtıcı olmayacak şekilde, sağlık çıktıları ve yoksulluğun arasındaki dağılımın ilişkisi incelendiğinde sağlık eşitliğinin coğrafik olarak adaletsiz dağıldığı görülmektedir. Bu çalışmanın bir sonucu olarak, eğer fakir ülkelerde kişi başına düşen milli hasıla artarsa, o bölgelerde yaşayan insanların sağlık durumu daha iyi olacaktır. Anne ölümü yüksek gelir ile bağlantılı olarak yoksulluğun azalması nedeniyle düşecektir. Buna ek olarak, doğumda beklenen yaşam süresi, kaba doğum hızı ve kişi başına düşen toplam sağlık harcaması yaşam kalitesinin değişmesi dolayısıyla artabilir.

Anahtar Kelimeler: Kişi Başına Düşen GSYİH, Sağlık Eşitsizliği, Sağlık Çıktıları, Yoksulluk, Beklenen Yaşam Süresi

YOKSULLUK İLE SAĞLIK EŞİTSİZLİĞİ ARASINDAKİ İLİŞKİNİN BELİRLENMESİ

Abstract

In the last two decades, many of countries have experienced the global crisis such as mortgage to theirs economic and political system with likely effects on inequality, poverty and economic stability. In this paper, for the first time, we examine poverty and health inequality in a dynamic context using a WHO data, collected from 2011. I show that health expenditure per capita is extremely related with life expectancy, which helps to realize poverty condition between developed countries and poor countries. Focusing on the dynamics of health, there are a lot of health indicators. For example; infant mortality rate, number of hospital beds etc. These indicators contribute to understand economic power of countries. Unsurprisingly, I examine the correlates of distribution of health outcomes and poverty while health equality is geographically more unfairly distributed. As a result of this study, if GDP per capita get higher and higher in the poor countries, health conditions of people in poor countries will be much better. Maternal mortality may decrease due to poverty reduction as related with high income. In addition, life expectancy at birth, crude birth rate and per capita total expenditure on health may increase due to change of life quality.

Key Words: GDP per Capita, Health Inequality, Health Outcomes, Poverty, Life Expectancy

1. INTRODUCTION

In the recent years, the top one of underresearched field which poverty is the oldest issue as far as history of humanity. 'What is the poverty?' question is relatively complicated. I cite as starvation, lack of education, homelessness, be ill and incurable, unemployment. It is estimated that 80 million human beings are inveterately undernourished, 2,600 million lack to fundamental sanition, 1,600 million lack electricity, 1,000 million lack adequate home and 1,100 million lack access to clean water. About 2,000 million lack access to basic drugs, 774

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million adults are illiterate and there are 218 million child employees. These severe deprivations insist because majority of people in world's population are too poor to preserve themselves aganist them (Pogge, 2008: 2).

According to World Bank, total population of Middle East& North Africa (Yemen, Tunusia, Iraq etc.) was 339,6 millions in 2012 and region's population increased 113,4 millions in the last twenty-two years. However, poverty headcount ratio at $ 1.25 a day (% of population) in the same region was 2,4% in 2010 while it was 5,8% in 1990. In addition, annual GDP growth was 3,4% in 2009. As compared to Europe&Central Asia (Albania, Bulgaria, Hungary, Turkey, Georgia etc.) There are some differences about poverty. For example, poverty headcount ratio at $ 1.25 a day (% of population) was 7% in 2010, total population in region was 272,1 millions and GDP growth was 6,3% in 2011 (http://povertydata.worldbank.org/, 10.04.2014).

More generally, there has been consensus between economic growth and poverty. One interpretation emphasizes significant correlation in the poverty-reducing effectiveness of growth (Fosu, 2010; Perera&Lee, 2013; Ferreira et al., 2010) while another interpretation emphasizes that financial development helps to decrease poverty but its effect is not linear (Uddin et al., 2014: 405).

Poverty is a significant problem for majority of countries. Also, a country has to construct poverty reduction strategy to indicate how money freed up from another sources will be used for poverty decrease. It is extremely possible that the impact of health inequality on poverty has been largely unclear from empirical framework. There are also dramatic differences in health inequality among countries, even among regional areas. For example, child mortality is a remarkable health indicator for all of the world. Deaths per 1 000 live births for 0-4 years show an interesting finding in WHO data. African region has the highest death count (101,9) in comparison with other regions at 2011. In spite of this, deaths per 1 000 live births of European region are only 13,4 and this is the lowest value in data. Therefore, poverty can affect life quality of people with systematic characteristics such as preference of settlement, infrastructure for health capital and health habits. Especially, a substantial study by Pritchett and Summers (1996) examined increases in per capita GDP had favorable health effects. As a country enhances wealthier, it logically has more sources to expend on health developing social schedules. For instance; suitable shelter, potable water and heathy foods and medical care.

This study focuses on two main positions: poverty and health inequality. Besides, common used criterion of relation is multiple regression analysis. This benchmark is frequently used to determine health-related inequality. In addition, some researchers have consistently found that health indicators as life expectancy has increased in most countries, independently of changes in income (Preston, 2007:490). When poverty or inequality was reducing, there was a positive influence of GDP on life expectancy at birth and infant mortality rates (Biggs et al.,2010: 270). When it comes to nonempirical study Doorslaer et al. (1997) offered proof on income-related inequalities in health. Using health interview survey data, they found a strong association between inequalities in health and income. According to study, inequalities were particularly high in the United States and the United Kingdom. Among other European countries, Sweden, Finland and the former East Germany had the lowest inequality. (Doorslaer et al.,1997: 94).

Another article found that at both state- and district-level public health is negatively associated with average income and positively associated with poverty. İnfant mortality rates demonstrate a negative coefficient in 35 states of India and Union Territories. In spite of that average income is negatively and significantly together with under five mortality (Rajan et al., 2013: 102). Methodological criticism of evidence linking health and income inequality has occured in the last decade. Population health does not depend on direct effect of income inequality and relatedly poverty (Deaton,2001; McCartney et al.,2013).

2. METHODOLOGY

This paper will use multiple regression analysis to geographically compare income and health outcomes in the world to a extensive measure of health inequality. The following of sections describe data and analytic strategy, the method of calculating income and health outcomes and the source of data.

Data

There are chosen 31 countries in this paper. They are drawn from the Legatum Prosperity Index (2013) to understand developing level of countries. The first 10 countries are respectively Norway, Switzerland, Canada, Sweden, New Zealand, Denmark, Australia, Finland, Netherlands, Luxembourg in Prosperity list. At the same time, it can be said that prosperity show wealth of countries. Then, less developed countries are selected from the same data. These are Chad, Central African Republic, Democratic Republic of The Congo, Afghanistan, Haiti, Yemen, Pakistan, Iraq, Sudan, Zimbabwe, Bangladesh, Nigeria, Kenya, Egypt, India, Senegal. Ultimately, There are developed countries such as Japan, France, United Kingdom, and United States. Turkey is also eighty-seventh in Prosperity İndex.

Furthermore, data are drawn from various official sources, World Bank and World Health Organization. Eurostat is used for number of physicians in Scandinavian countries. Life expectancy at birth, per capita total expenditure on health (PPP int. $), infant mortality rate (per 1000 live births), under five mortality rate (per 1000 live births), maternal mortality ratio (per 100 000 live births), number of physicians data for this study are computed from World Health Organization database. The second key data of this paper is the poverty, crude death rate, population, GDP per capita (current US$), out-of-pocket health expenditure (% of private expenditure on health) data from World Bank (2011-2012).

The analysis was conducted using SPSS version 16.0. To decide magnitude and direction of the effect of economic factors on health outcomes, I used multiple linear regression that accounted for correlation between inequality and health dimensions of the data. Regression is a statistical tool used to represent the data with set of parameters by establishing a accurate relationship between dependent and independent variables. Dependent variable also termed as response variable. Independent variable also termed as predictor variable to find out its functional relationship with the dependent variable (Jamil, 2013: 284). For this study, four dependent variables are used such as life expectancy at birth, population, crude death and birth rate. In addition, other criterions are measured as independent variables. All influencing factors were combined to establish the multiple linear regression equation and I get some equations. Thus, it can avoid including into less remarkable variables and dropping the important ones.

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3. RESULTS
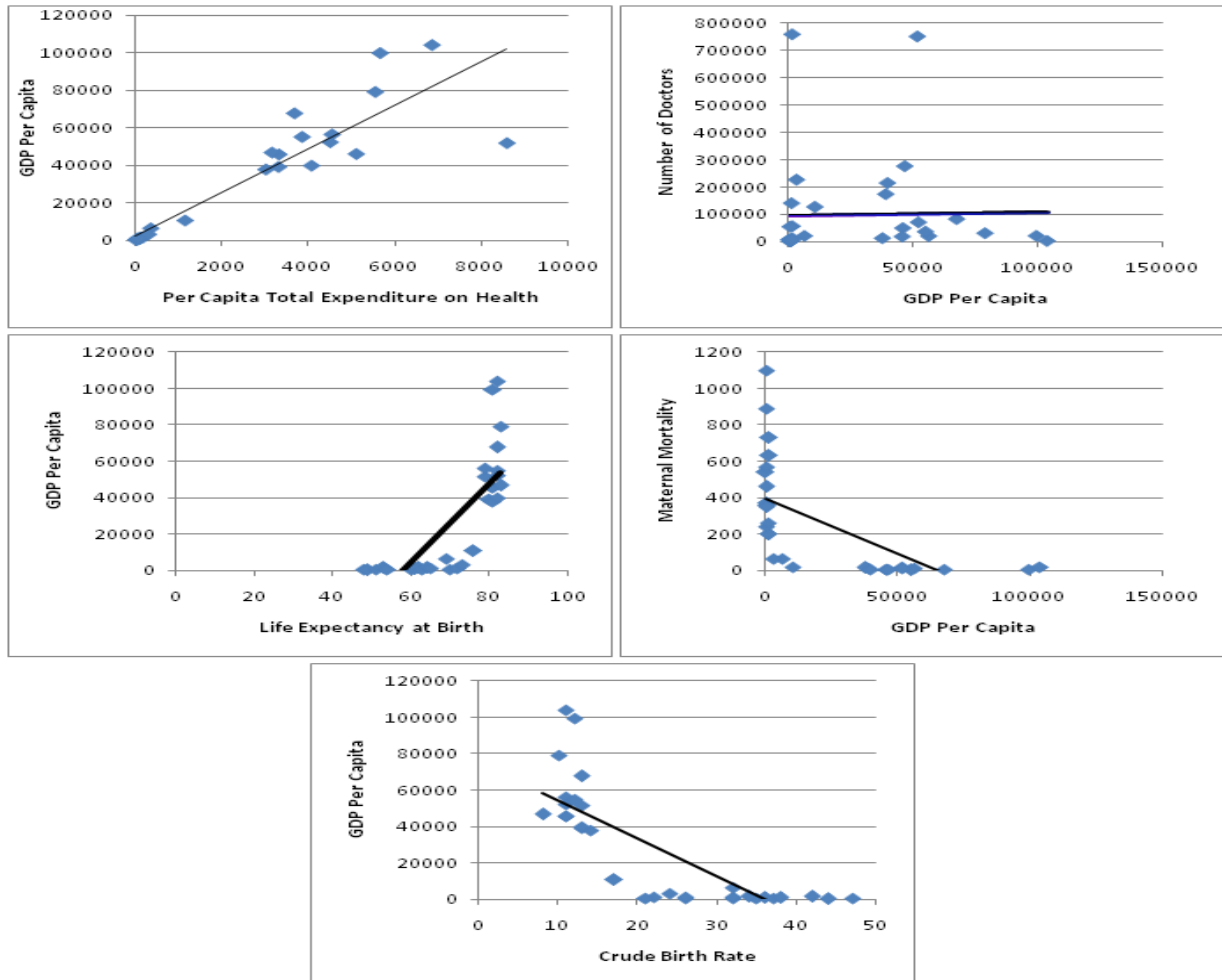
3.1. Scatter Plot Analysis

For the above five sorts of influencing parameters, this study uses scatter plots to determine whether its impact on the dependent variable is significant to elect whether it is an independent variable (Figure 1.)

Using typical regression notations, we can specify the relation between income and health as follows:

$$y_i = \beta^*(x_i) + e_i,$$

where y_i is the GDP per capita i; x_i is the health outcomes i; β^* represents the nonlinear (or concave) nature of the relation between y_i and x_i; and e_i is the residual differences in GDP per capita, after accounting for health outcomes.

Figure 1. Scatter Plot Analysis

It should be noted as well from the above the scatter plot analysis, per capita total expenditure on health, crude birth rate and life expectancy at birth have a apparent linear correlation with GDP per capita R2 respectively 0,828, 0,621, 0,609, while R2 for maternal mortility is 0,402 and R2 for number of doctors is 0,00. So the effect for GDP per capita is not rather significant. For this reason, number of doctors cannot be used as the independent variable in the multiple linear regression. The results based on correlation analysis using SPSS are shown in Table 1.

Table1. Correlation

	GDP Per Capita	Per Capita Total Expenditure on Health	Life Expectancy at Birth	Maternal Mortality	Crude Birth Rate	Number of Doctors
GDP Per Capita	1	0,910	0,781	-0,634	-0,788	0,019
Per Capita Total Expenditure on Health	0,910	1	0,781	-0,643	-0,794	0,253
Life Expectancy at Birth	0,781	0,781	1	-0,905	-0,643	0,198
Maternal Mortality	-0,634	-0,643	-0,905	1	0,859	0,256
Crude Birth Rate	-0,788	-0,794	-0,643	0,859	1	-0,263
Number of Doctors	0,019	0,253	0,198	0,256	-0,263	1

Seen from Pearson Correlation test, per capita total expenditure on health, Crude birth rate and life expectancy at birth have a very obvious linear relationship with GDP per capita while maternal mortality and number of doctors have little, which account for the scatter plot analysis. For this reason, I except number of doctors as independent variable. Of note are the very high bivariate correlations between GDP per capita and the other variables. Especially per capita total expenditure on health (r=0,910), crude birth rate (r=0,788) and life expentancy at birth (r=0,781).

Table 2. Model Summary

Model	R	R Square	Adjusted R Square	Std. error of the estimate
1	0,944	0,890	0,883	4,01951
2	0,915	0,837	0,825	5,04651
3	0,915	0,838	0,826	5,03645

Table 2 shows the relations based on GDP per capita computed using the health indicators. This table got three models. In the first model, GDP per capita was associated with life expectancy at birth and maternal mortality. The addition of maternal mortality only slightly improved the variance explained, but the addition of life expectancy at birth significantly effected to income distribution. There was a significant interaction between crude birth rate and maternal mortality (β=-0,407; β=0,601; p= 0,00) in the second model which GDP per capita was in association with crude birth rate and maternal mortality. Ultimately, the third model demonstrated relationship between per capita total expenditure on health, crude birth rate and maternal mortality. These findings are consistent with the view that health capital on health mediates the impact of crude birth rate and maternal mortality, while it mediates the impact of inequality on health. Model 1, Adjusted r^2=0,883, which means can explain 88,3% change in GDP per capita. Therefore, the selection of multiple linear regression equation is Model 1.

Table 3. Anova

Model		SS	df	MS	F	Sig.
1	Regression	3677,169	2	1838,58	113,799	,000
	Residual	452,380	28	16,156		
	Total	4129,548	30			

Table 3. provides the detailed review of the coefficent effect using regression, conduct F-test, the value of significant level sig=0,000< 0,05; thus the coefficents in the regression equation are not zero. The presumption of zero coefficents is rejected and equation is fitting as well.

Table 4. Coefficients[q]

Model		Unstandardized coefficients		Standardized coefficients	t	Sig.
		β	Std. error	β		
1	(Constant)	73,312	1,579	,345	46,424	,000
	Life Expectancy at Birth	,000	,000	-,686	4,269	,000
	Maternal Mortality	-,027	,003		-8,477	,000

q: Dependent variable: GDP per capita

Establish a linear regression model based on each variable coefficient shown in Table 4:

$$Y = 73.312 + 0.000X_1 + 0.027 X_2$$

The value of all significant level is 0,000; all beneath 0,05; meaning all variables affect GDP per capita dramatically.

4. DISCUSSION

Using data from 15 developing countries and 16 less developed countries for he period 2011-2012, the present papers examine the effect of income distribution on health and poverty. The research questions of the study are as follows: To what extent has GDP per capita led to a increase in health status? Does income equality led to higher health equality? Has the level of health outcomes had an influence on poverty reduction?

Income should be a remarkable value of health is more reasonable in less developed countries than in rich ones. If many people do not have enough money to buy sufficient food, especially children seldom suffer from a poor diet, and parents do not provide to feed their children, there is a dramatic problem for all of the world (Deaton, 2003). According to a research conducted in South Africa, this work finds evidence of grand effect of income on health outcomes (Case,2004: 295). In addition, the same author did the other study about this issue and her study examine that a family's long-run average income is a powerful determinant of children's health status (Case at al.,2002: 29).

In spite of this, the study advanced by Mellor and Milyo (1999) may also help to explain the negative relationship between income and health outcomes. Mellor and Milyo indicated that income inequality is not one of the most powerful determinants of health. They assumed that they control for unobserved fixed effects that may be spuriously correlated with income inequality and they explore whether the relationship between income inequality and health is robust across geographic units. The failure to find a robust association between income inequality and health after controlling for fixed effects in United States. This paper also claims that the psycho-social effects of income inequality have dramatic consequences for individual health outcomes. Besides, this report advanced by Rowlingson (2011) can help to understand the results of Wilkinson and Pickett (2010). According to report, the negative impact of income inequality on health and social problems is 'status anxiety'. This suggests that income inequality is harmful because it places people in a hierarchy that increases status competition and causes stress, which leads to poor health and other negative outcomes. However, this theory has been challenged in terms of the precise mechanisms involved and the conceptualisation and definition of 'status'.

It can clearly be said that there is a noticable difference at cross-continental results. While people in less developed countries do not benefit from adequate health cares, people in developed countries take suitable health cares. Moreover, there is a important difference in United States. For example, Kennedy at al. (1997) tested the deleterious health consequences of the experience of racial discrimination in African Americans. The present study examined the association of racial prejudice-measured at a collective level to black and white mortality across the United States. Both measures of collective disrespect were strongly correlated with black mortality (r = 0,53 to 0,56), as well as with white mortality (r = 0,48 to 0,54). A 1 percent increase in the prevalence of those who believed that blacks lacked innate ability was associated with an increase in age-adjusted black mortality rate of 359,8 per 100,000.

Like this paper, Leigh at al. (2009) concluded that they except the three poorest OECD nations (Mexico, Poland and Turkey) and the richest (Luxembourg) and weight the remaining countries equally when they predict the slope. Using either life expectancy or infant mortality as a benchmark of health indicator, the harmless effect of income on health appears substantial as countries move from about $15,000 to $25,000 US dollars per capita. However, it does not include all of factors. Thus, reading of the evidence in this work is that most

studies of health and inequality find no statistically significant relationship income and health outcomes.

5. CONCLUSION

As a result of this study, if GDP per capita get higher and higher in the poor countries, health conditions of people will be much better. Maternal mortality may decrease due to poverty reduction as related with high income. In addition, life expectancy at birth, crude birth rate and per capita total expenditure on health may increase due to change of life quality.

Predictably, decisions of policymaker are very important on poverty and health inequality. The basic policy implication here is that officers need to tackle both poverty and inequality. Policymaker should walk on the same road. This expectation is said by Lynch et al. (2004), who result in their major critic: 'Reducing income inequality by raising the incomes of more disadvantaged people will improve the health of poor individuals, help reduce wealth inequalities, and increase average population health' (Rowlingson,2011).

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