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Linking Health Budgets to Economic Development

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Abstract:

In this study, we explore the relationship between public health expenditures and economic performance of 22 countries. Healthcare spending can lead to better health opportunities which can strengthen human capital and increase productivity, contributing to economic growth. Therefore, it is important to evaluate the phenomenon of healthcare spending in a country. We collected economic and health data of 22 countries from the World Bank database. The time period of the data is from the year 2000-18. Using visual analytics, the overall results strongly suggest a positive correlation between GDP per-capita (current US$) and Current health expenditure per-capita (current US$). Also, the research shows that there is negative correlation between Out-of-pocket expenditure and current health expenditure. The result of Multiple Linear Regression shows that Current Health Expenditure per-capita and Domestic general government health expenditure per-capita (current US$) has a positive and significant impact on the GDP per-capita of any country. As a result, making investments in healthcare by the government would boost income, GDP and productivity, as well as alleviate poverty. Considering these potential benefits, universal healthcare deserves additional research.

Keywords: GDP per capita, Out-of-pocket expenditure, Public Health expenditure.

1. INTRODUCTION

In an economy, healthcare spending and the impact it has on the performance of the economy are very important factors for the development of that particular economy. Endogenous growth models emphasize the importance of human capital for economic growth and development (Romer, 1990). It is widely acknowledged that health is one of the most important factors determining economic development, a healthy population means a higher level of productivity. Additionally, health indirectly impacts economic growth because aspects such as child health have an impact on the future income of people. An indirect impact is easier to understand if it is observed in the context of a family. When a family is healthy, both the mother and father can work, earn money, and feed, clothe and educate their children. A healthy and well-nourished child will perform better in school and a better performance in school will positively affect their future income. Generally, if parents make sure that their children will be able to reach adulthood, then they will have fewer children overall, and they can invest more in their health and education. Further, health loss has a greater impact on the poor since the body is the main asset and at times the only one. When these people become ill, they are left with fewer options and suffer greater consequences.

According to researchers like Lucas (1988), Mankiw (1992) Human capital is crucial to economic growth because it serves as a catalyst for economic development. As a result of the health led growth hypothesis (Muysken, 2003), health expenditure contributes to economic growth. According to this theory, health is capital; as a result, investments in health may increase productivity, therefore incomes and the welfare of the population. Bloom and Canning (2000), in their studies highlight that when labour is strong, it is more likely for them to develop new skills and knowledge because they expect to reap long term rewards. As a result, workers with poor health will be negatively affecting productivity, this explains the disparity in development between different regions of the world. According to World Health Organization report of 2005, 50% disparity in economic growth between developed and developing countries is due to ill health and low life expectancy.

Objectives of the Study The primary objectives of this study are as follows.

- To study the relationship between the Health Expenditure and Development of an economy especially in the context of Out-of-pocket expenditure.
- To study the relationship between the out of pocket expenditure and current health expenditure of an economy.

This paper consists of six sections. Section-1 consists of introduction, section-2 briefly reviews previous research on the impact of government health expenditure on the economic development of a country, section-3 discusses the importance of public health expenditure empirically using scatterplots, section-4 contains the research methodology that is used in this study. Section-5 contains the results i.e., the impact of Public Health expenditure on the GDP per capita of an economy was discussed using Multiple Regression technique and finally section-6 consists of conclusion.

2. REVIEW LITERATURE

A number of factors make health care different from other budget items (Arora, 2001) for example, its consumption is unpredictable and irregular. The value of curative health care is negligible except in the event of illness, which is beyond the control of the individual and whose onset carries a high risk of physical impairment or death. A patient's consumption of health care may be uncomfortable and painful, yet, at best, it allows her utility to be restored to its pre-illness level. As a result, the reduction in health expenditure on other budget items will reduce welfare rather than increase it, as is the case for other goods and services.

A study by Sorkin (1977) examined the impact of health on economic growth in developing countries concluded that a decrease in birth rates positively affected economic growth. As a result, health expenditures increased threefold, from $83M to $286M, and outpaced GDP growth. The study showed that health and income were interrelated and concluded that problems affecting healthcare delivery negatively affected economic growth (Strauss et. al, 1998). The effects of health on economic growth for industrialized countries were studied by Arora (2001). In a study that analyzed health indicators from 1965-1990 for developed and developing countries, economic performance in developing countries increased significantly with an improvement in public health (Bhargava et. al, 2001). Acemoglu et. al (2007) suggested that a 1-year improvement in life expectancy increases economic growth by 4%.

Furthermore, Mayer et. al (2001), found that a healthy population may be more important than education for human capital in the long run. With the extended Solow growth model, authors examined 21 African countries for 1961-1995 and 23 Organisation for Economic Co-operation and Development (OECD) countries for 1975-1994 and found 23 OECD health stocks affect growth rate of per-capita income (Gyimah et. al, 2004). Muysken et. al (2004) also investigated whether health is one of the determinants of economic growth and concluded that there is an iterative relationship between economic growth and health. High economic growth leads to investments in human capital and to advancement in health, and population health leads to more labor productivity and economic growth. The Schumpeterian growth theory was used by Aghion et al. (2005) to analyze channels associated with the influence of national health on economic growth. Health is one of the critical dimensions of human capital, according to the theory. A high life expectancy has also been shown to be critical for sustainable economic growth (Cervellati et al, 2011). Aghion et al. (2011) applied the endogenous growth theory, which proposes that a longer life expectancy enhances economic growth, to study the relationship between health and economic growth. They examined life expectancy for different age groups in OECD countries and found a decline in mortality rates for those under the age of 40 led to an increase in economic growth.

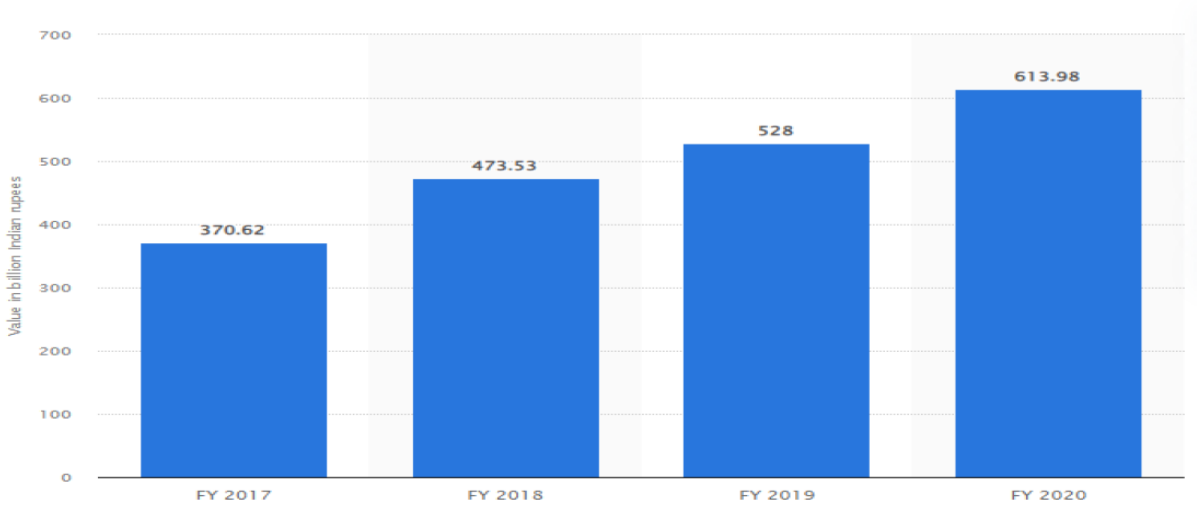
Researchers like Bloom et. al (2004) and Öztürk et. al (2014) has shown that improvements in health can lead to an increase in Gross Domestic Product (GDP) and vice versa. Healthcare plays an important role in human capital development. Piabuo et al. (2017) has showed that by increasing healthcare spending, human capital becomes more productive, thereby contributing to economic growth of a country. Most of the researchers never took South Asian countries particularly India and its neighboring countries in their sample. Therefore, we felt that there was a need for study wherein the situations of India and its neighboring countries should be examined in details. This study bridges this gap by taking the recent and most relevant data from World Bank to analyze the relationship between public health expenditure and economic development of an economy.

3. PUBLIC HEALTH EXPENDITURE VS DEVELOPMENT

3.1 Public Health Expenditure in India from financial year 2017 to 2020 (in billion Indian rupees) India's public health expenditure has been steadily rising over the last decade in order to cater to its growing population. In fiscal year 2018, the value of public health expenditure by states and union territories together amounted to around 475.53 billion Indian rupees (Figure-1). This was estimated to be around 1.28 percent of the country's GDP. In comparison, the United States' budget estimates showed an outlay of over 17% of the GDP to public health expenditure in its fiscal year 2018.

Including the private sector, the total healthcare spending in the country rose to 3.6% of GDP in 2016 but even this is very low compared with other countries. The average for OECD countries in 2018 was 8.8% of GDP while the healthcare expenditure in the developed countries like the US was 16.9%, China was 5%, Germany was 11.2 %, France was 11.2% and Japan was 10.9%.

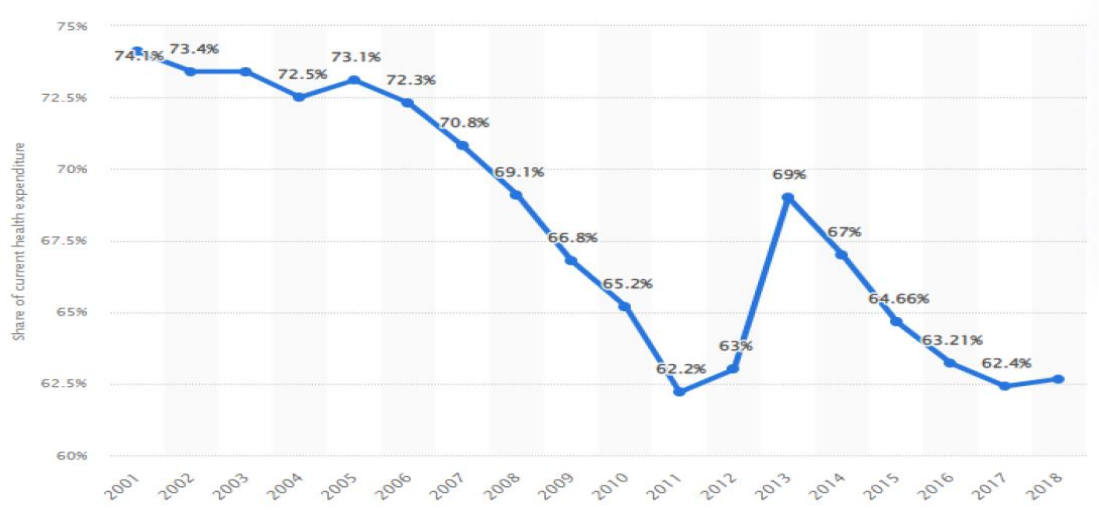
Figure 1: Public health expenditure in India FY 2017-2020



3.2 Health Expenditure in India

As shown in figure-2, Indians spent around 62.4% of their total health expenditures from out-of-pocket expenses in 2017 while the world average was just 18.2%. Healthcare expenses that people pay directly to providers dropped from 74% in fiscal year 2001 to 62% in fiscal year 2018.

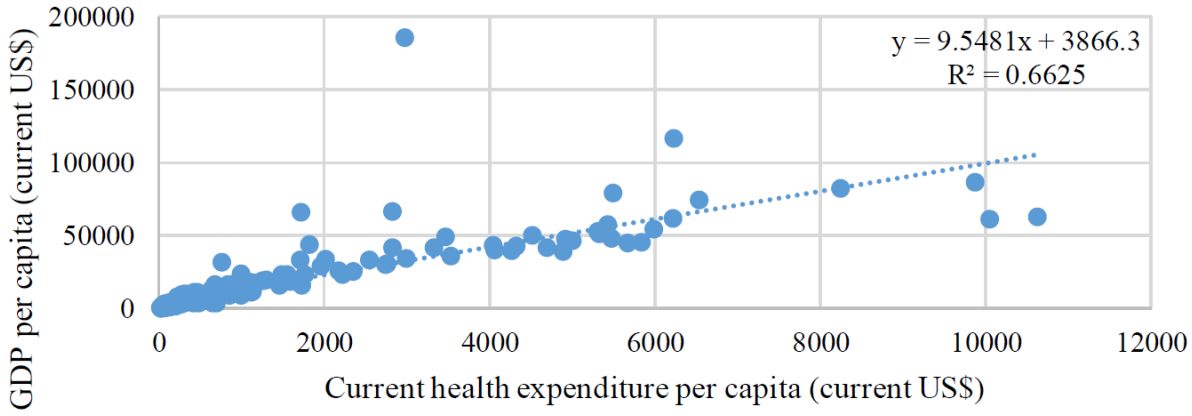
Figure 2: Share of current health expenditure in India FY 2001-2018



3.3 Health Expenditure vs GDP per capita

The figure-3 shows a positive relationship between current health expenditure per-capita (current US$) and GDP per-capita (current US$) of 151 countries in the world in the year 2018. The R2 between them is 66%. From the figure-1, we can make an inference that as the current health expenditure per-capita (current US$) increases, the GDP per-capita (current US$) also increases.

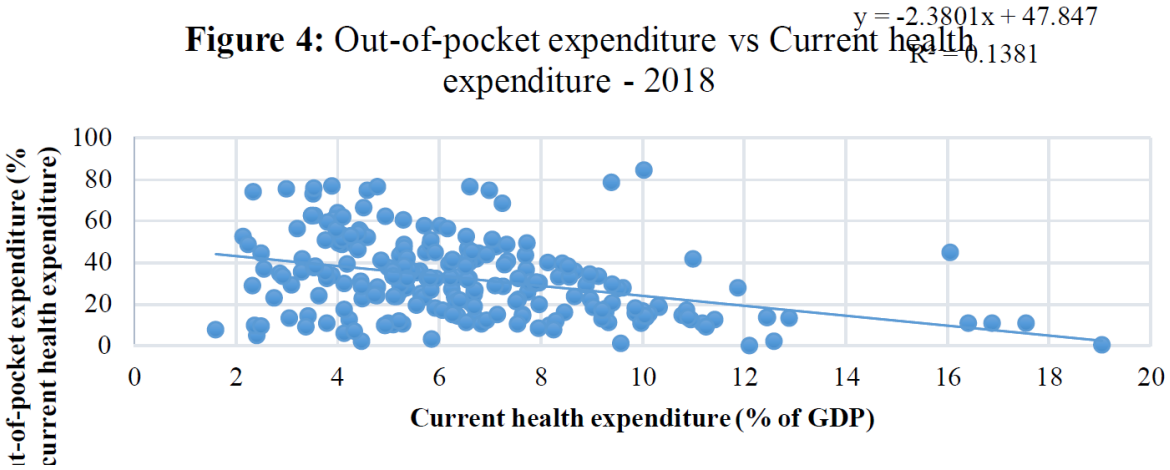
Figure 3: GDP per capita (current US$) vs Current health expenditure per capita (current US$) - 2018



3.4 Out of Pocket Expenditure Vs Health Expenditure

The figure-4 shows a negative relationship between out of pocket expenditure (OOPE) and current health expenditure of 151 countries in the world in the year 2018. As the Current Health Expenditure (% of GDP) by the government decreases, the out of pocket expenditure (% of current health expenditure) increases. Therefore, the government must make sure to increase its expenditure on health as this will ease of the citizen's personal expenditure on health. This will ultimately increase the savings of the people and by doing so every poor will get expensive treatments free of cost which will ultimately increase the labour productivity and thus the GDP per-capita of a country can be increased.

Figure 4: Out-of-pocket expenditure vs Current health expenditure - 2018



4. DATA AND RESEARCH METHODOLOGY

The data of 22 countries namely Afghanistan, Bangladesh, Bhutan, Switzerland, Czech Republic, Germany, Denmark, Spain, France, United Kingdom, Italy, Sri Lanka, Luxembourg, Maldives, Netherlands, Norway, Nepal, Slovak Republic, Sweden, India, Pakistan, Maldives were taken to determine the impact of Health expenditure on the respective country's GDP per-capita. The data related to GDP (per-capita US$), Current Health Expenditure (% of GDP), Out of pocket expenditure (% of current health expenditure) was collected from the World Bank website. The time period of the data is from the year 2000-18. Multiple Regression technique was used to determine the impact Public Health Expenditure on the development of a country. Here, a Multiple Linear Regression model was run where the GDP (per-capita US$) was taken as the dependent variable and the two independent variables taken were Current Health Expenditure per-capita and Domestic general government health expenditure per-capita (current US$). Log values of all the variables was taken as the data is non-linear in its distribution.

Table 1: Data description of model		
Data	**Data Description**	**Source**
GDP (Y)	GDP (per-capita US$)	World Bank
CHE (X_1)	Current Health Expenditure per-capita (current US$)	World Bank
DHE (X_2)	Domestic general government health expenditure per-capita (current US$)	World Bank
OOPE	Out-of-pocket expenditure	World Bank

5. RESULTS

After the computed results the, mathematical equation for Multiple Linear Regression can be written as shown in the equation-2. As shown in the table-2, the total number of observations were 416, the R2 for model was 98%, which means that the independent variables have significant impact on the GDP per capita of a country. The p-value of all the variables is less than 0.05. In other words, all these variables have a significant impact on the economic development i.e., the GDP (per-capita US$) of a country. For a 1% change in Current Health Expenditure per-capita (current US$) the GDP (per-capita US$) will increase by 0.45% and for 1% increase in Domestic general government health expenditure per-capita (current US$), the GDP (per-capita US$) will increase by 0.29%.

Regression Statistics	
Multiple R	0.991614732
R Square	0.983299777
Adjusted R Square	0.983218904
Standard Error	0.102434267
Observations	416

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	1.943395828	0.027227	71.37774691	**1.9612E-234**	1.889875213	1.996916
Current Health Expenditure per capita	0.459466395	0.02886	15.9207934	**7.6684 3E-45**	0.402736535	0.516196
Domestic general government health expenditure per capita(current US$)	0.299813746	0.023049	13.00757848	**1.1647 8E-32**	0.254505448	0.345122

6. CONCLUSION

The findings indicate that, in general, healthcare spending and GDP per-capita are positively correlated. Furthermore, spending on personal healthcare adversely affects time spent on purchases of goods and services. There is a negative correlation between out-of-pocket expenditure and current health expenditure. The variables Current Health Expenditure per-capita and Domestic general government health expenditure per-capita are having positive and significant impact on the GDP per capita of the 22 countries as their p-value is less than 0.05. Therefore, there is a need to enhance public health spending to a minimum of 5% of the GDP. A key aim of this study was to provide in-depth explanations of how the government can allocate healthcare expenditures in ways that will stimulate economic growth while improving the health of the population. Policy makers must also implement macroeconomic policies that target public health expenditures and economic development. With regards to the potential benefits of health care to the economy, universal access to healthcare is an area that should be researched further.

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