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HUMAN HEALTH AND POVERTY: AN EMPIRICAL ANALYSIS OF SELECTED SOUTH ASIAN COUNTRIES

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ABSTRACT

Health is an important indicator of human capital that enhance the productivity of individuals. The objective of the study is to analyze the factors that affect human health. Poverty is one of the main indicators which affect the health badly. The purpose of this study is to find the impact of poverty, income and education on human health in South Asia for 1980-2017, applying panel OLS and fixed effects model. The results indicate that poverty is one of the main reason that adversely affects human health whereas healthcare services are helping to improve their health status. The findings also showed that education and individual's income are also playing a vital role for better health in South Asia. The study suggests formulating policies which improve the healthcare facilities and education to reduce poverty.

INTRODUCTION

Health is the actual foundation of economic development. A physical and mentally healthy population is the engine of economic growth, moreover, at individual level health is crucial to enjoying a more productive life. Health is considered as an indicator of human capital, and it is well admitted that good physical and mental health led to positive impacts on the productivity of the individuals. On the other hand, a situation of depression, which affects the productivity of the individuals badly, and the person loses both health and wealth.

South Asian region is the most important region of the world. It is the home of almost 22% world's poor, which is determined by the set poverty line. Poverty

affects the health of the poor people in the region, moreover affluent significantly affect the self-rated health of the people. So, the association between health and poverty confirmed this fact that the causality runs in both directions.

Less income countries, people who owned a very few amounts in hand, suffer more through the multiplicity of diseases, moreover, these people face a vicious circle of poverty as poor people have ill health and ill health brought poverty. The worst socioeconomic inequalities are found in the region of South Asia, and this deteriorated situation is bear in form of the bad healthcare system. In numerous studies, the disparities in the healthcare system have been studied. It is also an international policy agenda to risen the health care facilities to improve health facilities in this region.

According to a report, about 44% population of India lives below the poverty line in Nepal, Pakistan and Bangladesh are about 38%, 31% and 29% respectively. The situation of poverty in Afghanistan and Bhutan is also relatively bad, because of unavailability of data the exact figure is not traced out. To deal with the question of chronically poor people in south Asia surveys attempted to describe it in a good manner which revealed that about one-third of the poor population in South Asia. In an individual's life and their standard of living, health is considered as a key component, bad health, deaths and mental depression are the central issues of shaping human capabilities. By the involvement of government, the targets of achieving the wellbeing and for increasing the productivity of the individuals can be achieved.

In South Asia, because of lack of income among countries and due to low standard of living people face infectious disease and these diseases can only be completely cured when the government increases its spending to combat this by vaccination, but as the budget of these countries is very low so it cannot achieve long term results. The connection between workers, education and their productivity is very strong, as the healthy and educated worker earn more than others (Zimmerman et al., 2015).

The symbol of prosperity and economic growth is economic development. Human capital is considered as an important indicator of economic development, as it helps in many aspects, for instance, it boosts the productivity and uplifts the level of efficiency of the available resource. Now, to discuss the relationship between economic growth and health, it is cleared that different countries have different growth rates. For this purpose, many factors have been analyzed among them a gross domestic product (GDP) of the countries is the topmost among all. GDP affects health at large extent as it is viewed that higher in GDP brings a reduction in infant mortality and increase life expectancies. If an increase in GDP positively affects the health of the people, then it must be defined through a proper mechanism which is found in the form of productivity of the workers (Bloom et al, 2019).

Health facilities cannot be enjoyed without proper knowledge, an educated person is aware of the possible outcomes of chronic disease and he/she can get rid of from ill-health (Mohan and Mirmirani, 2007). The physicians are very

crucial for attaining better health as they are an important part of the healthcare system (Siddique & Kiani, 2020).

Human capital is considered a key factor which uplifts the worker's capabilities, i.e. their ability to do work, and this is achieved only by good health. Better life expectancies indicate the improvement in the living standard of individuals. An analysis is presented by Swift (2011) which confirmed an incorporation association among GDP and life expectancy in OECD countries.

To determine the public health priorities, the data on life expectancy and infant mortality is considered as an ample core. As long as, infant mortality rate decreases and life expectancy increases, as a result, the status of health will improve. A pivotal investigation by Pritchett and Summers (1993) showed that an increase in per capita GDP has positive health effects. At the national level, if a county has more resources to spend on health it becomes wealthier. Usually in developing countries, people have a lack of financial resources and they mostly cannot bear the burden of health expenditures, so, they prefer to earn for food. In those cases, the government of those countries directly involve and give benefits to the people. Mostly, in developing countries, there is a problem of infectious diseases, high rate of infant mortality, and premature mortality which cannot be tackled alone but only by the vaccination at a wide scale, provide clean drinking water and sanitation system, which can only be run through the involvement of government.

In South Asia, the government has a limited budget and it has to spend it on various sectors as well, the government has to make its expenditure on investment so that the growth of the country should be stable but they ignore this fact that spending on today would not cure those issues which need attention in a long term. Public spending on health, education, provision of better health facilities, on vaccination of infectious disease, to combat future disasters. It is not argued that the government is not making any spending over these areas but spending less than it is required. WHO provides a particular figure to the countries which must be fulfilled (Irfan, 2000).

It is well known that health led to its direct effect on productivity. To improve the status of health, reduction in infant mortality is complementary, it means that if the death rate of newly born babies controlled it in return has direct consequences on growth. Moreover, by providing health facilities, on the right time, it will reduce the death rate of newly born babies, who are particularly are not able to bear infectious diseases is it cause a "baby boom cohort".

The discussion can be summarized with this argument that spending on health is the investment which has a large effect on economic performances. The cost which is bear upon controlling the infectious disease in South Asian countries might be low as compared to other developed countries. In South Asia, the investment on health is seen as a significant impact on growth, and bidirectional impacts of growth can also be seen in the form of an increase in life expectancy and reduction in infant mortality, but this situation is different in the developed part of the world, where the benefits of spending on health can be witnessed only in elder age and late retirement (Zaidi et al., 2017).

The study used different indicators to examine the relationship between poverty and health by keeping education, economic growth, and health facilities in consideration also for 1980 to 2017 in South Asia.

LITERATURE REVIEW

An overview of the previous finding on the context of health and poverty relationship is described. How capital influences health? This association is also viewed from previous studies.

Another dimension for measuring the poverty determinants is been added in literature by examining the economic structure of neighbouring country on the homeland, (Wen et al., 2003). The economic structure of neighbour is viewed by their poverty, their income distribution and self-rated health for a home country in the USA. Data has been taken between 1990 and 1999. It is indicated that there is a significant impact of wealth on health.

Findings of the research indicate that most disadvantaged group of the society like children poverty, single-parent mothers, and addicted to drugs faced worst poverty, and this situation is most alarming in Portugal. Santana (2002) contributed to the literature by focusing on that disadvantaged group, where there are extreme cases of poverty adversely affect the health of the people. In 1990, Portugal was that country which is topmost who face the worst poverty. To draw the facts a survey is conducted in which people belong to urban and suburban areas are traced out. Finally, it is concluded that there is a need to make such policies to improve and provide better health services.

In particular, if an individual is facing any kind of poverty, what will be the effects on later periods about health and health behavior? A unique study which uses structural life course approach (Green et al., 2018), addressed the above question for two countries which have almost same liberal cash transfer approaches but different approaches to health care provisions. A very large sample data is taken from both countries about different variables like poverty in early age about 0 to 5 year, poverty at early adolescent age, cumulative poverty, persistent poverty, and poverty in any period of life, health behavior like smoking at adolescent period. Bayesian information criterion approach is applied which make it clear that Poverty was more persistent in the US, but associations between poverty and outcomes were consistent across countries. Although poverty can have cumulative effects on health and behavior, early interventions may offer the best long-term protection.

Poverty and mental health of the people is studied by Belle (1990) for America. The health for particular gender women is studied and it is concluded that low income and low socio-economic status is the cause of mental disorder among women of America. The single parent mother faced this problem usually than others. By the support of literature, it finds that mental disorder especially among female is in an alarming situation which needs serious consideration for policymakers.

David et al. (2017) provided an overview about different conflicts that prevail in South Asia and how they affect the health. In their research it is focused that as South Asia is an important region for the whole world and it is very populous but there exist many conflicts, which is defined as when two groups are against each other and casualties occur because of tension which is been created by these groups. In south Asia about all countries faces different types of conflicts among which migration is also placed big. Refugees get a little access to health care because of several reasons, like documentation, lack of resources, lack of awareness about where the health care units exist, but among all the reasons poverty is dominant. So the linkage between health and these conflicts is examined by various factors like mortality morbidity sexual health, gender-based violence etc. It is concluded that there is a need to improve health providing services in this region which is severely affected by many conflicts.

Zaidi et al. (2017) added a great contribution in literature by providing a view on a rapid increase in initiatives which provided by health and more inequalities. Moreover, it is concluded that south Asia is more active to plan to regulate and implement the programs.

South Asia is an important region of the world as worlds 5th population live here and about 43% of the world's poor is also having in the region. Unnisa et al. (2016) explored the relationship between growth, trade and poverty in South Asia, by taking different variables in consideration like trade, consumption, infrastructure development, investment, human capital index, Gini economic growth, life expectancy, secondary school enrollment, unemployment, poverty etc. It is concluded that openness has a positive effect on growth and if growth increases are a result of poverty reduces, which ultimately brings prosperity in the region. The data has taken from the period of 1960- 2014.

Owen and Wu (2007) worked on the association of trade openness and health as it is globally argued that the consequences of international trade adversely affect the health of people in developing countries. Some economic theories also anticipate that trade brought prosperity in developing countries as the average income of the individual increases. To find out the facts, the panel data of 139 developing countries is collected. Fixed effects approach is used by taking the data from the period of 1960-1995. The results indicate that an increase in trade reduces the average infant mortality and increased average life expectancy.

The linkage between income disparities and life expectancy and the impacts of illiteracy on health is studied for Brazil by Messias (2003) for 27 Brazilian states. Results indicate that there is a negative association among income disparities and life expectancy, illiteracy also showed a negative relation with life expectancy, while income is positively associated with life expectancy.

Income affects the health care expenditure is addressed by many researchers and used various techniques to undermine its consequences over health. For the United States, Lopez et al. (2016) measure the impact of income inequality

on health care expenditure by taking Gini coefficients as the measure of income inequality. Data is collected from 1998 to 2011. It is concluded that income inequality independently linked with greater expenses in health care.

Marmot (2009) analyze various studies and tried to answer the basic question which was in a discussion that to what extent income does affect health, individual earnings or by the income inequalities that prevails in the neighbour countries and their consequences on other regions. A detailed analysis is conducted in this regard which finally concluded that tax benefices policies and efforts to reduce the income inequalities will positively affect the health of the individual.

To understand the linkage between health and education, various studies are conducted which determine the various nature of the relation by using several variables, Cutler and Lleras-Muney (2007) also contributed to the literature by analyzing the relationship between life expectancy and no of years of school attending. It is concluded that as long as the education level increases the health of people improves. Taking these results as an economic perspective, it is quite clear that educated people get jobs and earn their livelihoods so they buy healthy food for themselves and also enjoy the health facilities.

It is admitted that education and health has a very close connection but the association among them remain the area of interest of many researchers. A new dimension of the relationship between education and health is given by Galama and Kippersluise (2015). It is described that health is different from skill, as health is for living a life which allows working to earn, it gives the time that can be devoted to generating income through work by utilizing the skills, so the relation between education and is not a simple one it is very complex in deep-rooted.

In this unique nature of the study, an attempt is made to understand the earned income tax credit families and infants health in term of birth weight. It is contributed in literature by providing an analysis that an increase in exogenous income, it will improve the health.

THEORETICAL FRAMEWORK AND METHODOLOGY

Theoretical framework

Good health considered as an important need and basic end because it helps to improve human health. To initiate an effective production function, good physical and mental health is considered as an important tool (Siddique at al., 2020). The economics literature has described many forces which derived economic growth. At the beginning of the 20th century, the average global GDP was less than its current value, and global life expectancy at birth was well below 40 years. It is well admitted that attitude towards health care affects health status. To promote better health, economic and social pathways affect the health of the individual Bloom et.al (2019).

$$health = f(income) \dots \dots (1)$$

Wen et al. (2003) investigated that, poverty hurts the lives of the poor. Due to lack of health facilities, bad road accommodations injuries are not treated properly and deaths occur. Poverty hinders the way of enjoying good health. Lowering the mortality rates, and to increase the life expectancy, health facilities are very important.

$$health = f(income, health\ facilities) \dots \dots (2)$$

Poverty adversely affects the life and health of the poor. Poor people remain backwards and deprived which directly affect their health (Wen et al., 2003). Poverty also has a bidirectional relation with health which showed that prosperity is drawn from good health and richness brings good health, while on another side, poor health brought poverty and vice versa (Abayawardana and Hussain, 2003). To understand the effects of those factors which influence the status of health in equation 2 can be extended by adding poverty.

$$. health = f(income, health\ facilities, poverty) \dots \dots (3)$$

Introducing the education and income as the determinant of health, a clear difference in morbidity, mortality and other risk factors is viewed by Siddique et al., (2018). Adults enjoy healthier and longer lives as long as the high level of educational attainments. At the macro level, it is viewed that health status disparities are greater among educated and uneducated people (Zajcova and Lawrence, 2018). The influence of capital on health and identified, an increase in mortality is contributed by income shocks and the provision of capital.

$$health = f(income, health\ facilities, poverty, edu, capital) \dots \dots (4)$$

$$H = f(Y, HF, P, E, K) \dots \dots \dots (5)$$

Equation 5 is converted into Cobb Douglas form:

$$H = Y^{\alpha_1} HF^{\alpha_2} P^{\alpha_3} E^{\alpha_4} K^{\alpha_5} \dots \dots (6)$$

By taking a natural log to linear equation 6:

$$\ln H = \ln Y^{\alpha_1} + \ln HF^{\alpha_2} + \ln P^{\alpha_3} + \ln E^{\alpha_4} + \ln K^{\alpha_5} \dots \dots (7)$$

The derived equation 7 is converted into an empirical model for the panel of South Asia.

$$\begin{aligned} \ln H_{it} &= \alpha_1 \ln Y_{it} \\ &+ \alpha_2 \ln HF_{it} + \alpha_3 \ln P_{it} + \alpha_4 \ln E_{it} + \alpha_5 \ln K_{it} + \varepsilon_{it} \dots \dots (8) \end{aligned}$$

In this equation, \ln is used for natural log, i , is an indicator of cross-section, while t represents time. H is used for health, and Y is an indicator of income. Health facilities are presented by HF , P is used for poverty, E is for education,

and K is used for capital. In this equation, α showed the elasticity of coefficient parameters.

To explain the relationship between poverty and health, we use two proxies of health i.e. life expectancy and infant mortality. Poverty gap is the proxy of poverty which are used in this study. Health facility is proxied by immunization and physicians. Gross enrollment in primary schools is used for education and gross fixed capital is used as capital.

$$LE = \alpha_{it} + \alpha_1 \ln YC_{it} + \alpha_2 \ln PHY_{it} + \alpha_3 \ln PG_{it} + \alpha_4 \ln E_{it} + \alpha_5 \ln K_{it} + \varepsilon_{it} \dots (9)$$

And eq. 10:

$$IM = \ln YP_{it} + \delta_2 \ln IMM_{it} + \delta_3 \ln PHY_{it} + \delta_4 \ln PG_{it} + \delta_5 \ln e_{it} + \delta_6 \ln K_{it} + \varepsilon_{it}$$

In these equations 'ln', is used for natural log, while, 'i' and 't' are used for cross-section and time respectively. LE is used for life expectancy which is a proxy of health, while, Y is used for income. PHY is used for physicians, PG is the poverty gap and E is used for gross enrollment in primary school which is proxy of education. K is used for gross capital formation. Infant mortality is showed by IM, which is used as a proxy of health.

METHODOLOGY

There exist several methods which can illustrate the impact of various social indicators on health in the cross country analysis. The study employed panel OLS and fixed effects model.

It is simply an OLS technique which runs on panel data to ignore the effect on individuals. Fixed effects model is used when we are interested to find out the influences of various variables over time.

Data

The linkage between poverty and health is described by using various variables which are briefly discussed in this section along with the correlation.

The study focused on South Asian countries in which Pakistan, India, Bangladesh, Sri Lanka, Nepal and Bhutan are included. The data is collected from WDI (2019) for all variables.

Health was decided on a global forum (millennium declaration) to eradicate extreme poverty among 189 members of UN millennium, there is need to reduce the figure which showed the deaths of mothers and newborn babies, so infant mortality is chosen as a parameter of health among different countries (Siddique et al. (2018) & (2020); Kamiya, 2010). Infant mortality is the number of those infants who doesn't enjoy their first birthday. Today maintain the health standard between the population across the globe is becoming a worldwide phenomenon because now it is accepted that the health patterns of

one nation affect the other (Global health). “Infant mortality rate is the number of infants dying before reaching one year of age, per 1,000 live births in a given year” (WDI, 2019). The rate of life expectancy is also used as the indicator of health which is used in the literature (Shahid et al., 2019).

Poverty gap is used as a dependent variable used as the proxy of poverty. “Poverty gap at \$3.20 a day (2011 PPP) is the mean shortfall in income or consumption from the poverty line \$3.20 a day (counting the non-poor as having zero shortfalls), expressed as a percentage of the poverty line, this measure reflects the depth of poverty as well as its incidence” (WDI, 2019).

GDP per capita at constant 2010 (YC) is used for life expectancy model, while, GDP per capita at purchasing power parity (YP) is used as income.

Education is strongly linked with health, those people who attended more year of schooling enjoy good health than others, so it is considered that education is the most important tool for bringing the betterment in health (Siddique et al., 2018).

Gross enrollment in primary level is used as the proxy of education. Immunization and physicians are also independent variables.

“Child immunization, measles, measures the share of children aged from 12 months to 23 months who received the measles vaccination before one year or at any time before the survey”. Physicians include generalist and specialist medical experts. Capital is the rate of change in investment and it is measured as gross capital formation.

Correlation among variables

Table 1 shows that income (YC) and physicians (PHY) are positively correlated with life expectancy (LE). The positive signs show the direction of the relations between dependent and independent variable. Poverty gap is taken as the proxy of poverty the negative sign with this variable shows that there exists a negative relation between PG and LE, while both education (SP) and capital are directly associated with life expectancy.

Table 1: Correlation Matrix (Model 1)

Variables	LE	YC	PHY	PG	SP	K
LE	1.0000					
YC	0.7289	1.0000				
PHY	0.4955	0.3728	1.0000			
PG	-0.7882	-0.6788	-0.2966	1.0000		
SP	0.6635	0.2444	0.2174	-0.4989	1.0000	
K	0.2382	0.4906	0.1338	-0.1262	0.2186	1.0000

Table 2 shows the correlation results of model 2, in which infant mortality (IM) is used as a proxy of health. The immunization (IMM), YP, SP, PHY and capital are negatively correlated with IM. The negative signs with variables indicate an inverse relationship between the variables.

Table 2: Correlation matrix (Model 2)

Variables	IM	YP	IMM	PHY	PG	SP	K
IM	1.0000						
YP	-0.2538	1.0000					
IMM	-0.4293	-0.1255	1.0000				
PHY	-0.3016	-0.2259	0.3025	1.0000			
PG	0.6777	-0.3766	-0.4441	-0.2649	1.0000		
SP	-0.5700	-0.1213	0.4121	0.1937	-0.2489	1.0000	
K	-0.4623	0.0569	0.3688	0.1682	-0.3642	0.3349	1.0000

EMPIRICAL RESULT AND DISCUSSION

Life expectancy and infant mortality both indicators are considered very essential to determine the health status of the region. The relation between per capita income and health is brought into discussion by many researchers and they found a positive association between them. The importance of education cannot be neglected to combat disease, the people who have enough income to spend on health tend to have good health as compared to deprived people.

Table 3: Panel OLS

Variables	Eq.1		Eq.2	
	Dep. var. : LE		Dep. var. : IM	
	Coeff.	Prob.	Coeff.	Prob.
Y	0.2766	0.0000	0.2851	0.1423
IMMU			0.0905	0.1426
PHY	-0.0024	0.5182	-0.0092	0.6767
PG	0.0925	0.4273	0.6637	0.0000
SP	0.5405	0.0000	0.0437	0.7318
K	-0.1386	0.0000	-0.3080	0.0089
R- Square	0.5416		0.4433	

Table 3 shows the results of panel OLS for both models. In model 1, income and education are increasing factors of life expectancy. The sign of poverty is not consistent with the literature but it is statistically insignificant. In model 2, the coefficient of income, physicians, and education is insignificant. The coefficient of poverty is positive which shows that increasing level of poverty increases the rate of child mortality.

Table 4: Results of Fixed effects Model

Variables	Eq.1		Eq.2	
	Dependent variable: LE		Dependent variable: IM	
	Coeff.	Prob.	Coeff.	Prob.
Y	0.0974	0.0000	-0.0562	0.9220
IMMU			-0.0365	0.1653
PHY	0.0065	0.0000	-0.0449	0.0000

PG	-0.0054	0.0877	0.1475	0.0000
SP	0.1961	0.0000	-0.5459	0.0000
K	0.0706	0.0000	-0.7839	0.0000
C	2.39721	0.0000	9.0591	0.0000
R-Square	0.8163		0.8097	

Table 4 represents the regression results of fixed effects for Eq. 1&2. According to the results of Eq.1, income has the coefficient of 0.0974 which shows a 1% increase in income causes a 0.0974% increase in life expectancy. The coefficient of poverty is negatively correlated with life expectancy. It is our main independent indicator which affects human health badly. The physicians, education and capital have also an increasing relationship with life expectancy. The results exposed that the income, education and healthcare facilities are the increasing factors of life expectancy while poverty decline the hope of life and adversely affect the human health in South Asia. The results are statistically significant and consistent with the literature (Siddique et al, 2018 and Bloom et al. 2004; Mohan & Mirmirani, 2007).

Results of Eq.2 exposed that income is inversely correlated with infant mortality and the coefficient (-0.0562) means a one percent decrease in income causes a 0.0562% increase in the rate of infant mortality. Poverty is a curse which has various effects on the macroeconomic indicators. The rate of infant mortality is high in the poor community. Results express that poverty is an increasing factor of infant mortality in South Asia. The coefficient of immunization is also negatively correlated with IM. Education, physicians and capital are playing an important role to decline the rate of mortality in children. The empirical findings are significant and matching to the literature (Siddique et al, 2018 and Bloom et al. 2004; Mohan, 2007).

CONCLUSION

Human health is a key indicator of human capital that improve the efficiency of individuals. The study aims to analyze the factors that affect health. Poverty is one of the foremost factors which disturb the health badly. This study is conducted to find the impact of poverty, income and education on human health in South Asia for the period of 1980-2017, using panel OLS and fixed effects method.

The empirics show that income per person increases the rate of life expectancy, whereas, it is inversely correlated with infant mortality. Poverty is the main independent indicator which affects human health badly. It is negatively correlated with life expectancy. Poverty is a curse which has various effects on the macroeconomic indicators. The rate of infant mortality is high in poor communities. Results express that poverty is an increasing factor of infant mortality in South Asia.

The coefficient of immunization is also negatively correlated with infant mortality.

The physicians, education and capital have also an increasing relationship with life expectancy, and on the other hand, education, physicians and capital are playing an important role to decline the rate of child mortality in South Asia.

The study suggests formulating policies which improve the healthcare facilities and education to reduce poverty.

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