



THE IMPACT OF HEALTH INDICATORS ON ECONOMIC GROWTH IN PAKISTAN

KASHIF RAZA

Lecturer, Department of Economics,
The Islamia University of Bahawalpur, Pakistan.
Bahawalnagar Campus
Email: kashif.raza@iub.edu.pk

SALMAN MAJEED

Lecturer, Department of Management Sciences,
The Islamia University of Bahawalpur, Pakistan.
Bahawalnagar Campus
Email: salman.majeed@iub.edu.pk

MARYAM ISLAM

M. Sc. Scholar of Economics,
The Islamia University of Bahawalpur, Pakistan.
Bahawalnagar Campus

ABSTRACT

This study aims at investigating the issues of health sector in Pakistan and highlights the important link between health indicators and economic growth. For this purpose, Ordinary least square method and Granger Causality technique are applied on time series data of Pakistan from 1980-2012. Health expenditures, fertility rate, life expectancy, and infant mortality rate have been used as health indicators. The basic objective of study is to enhance those issues in health sectors that directly or indirectly strike on economic growth of Pakistan so that effective policies can be chalked out to cope current as well future condition regarding health and an economic growth. The results showed that life expectancy, fertility rate, investment on health sectors has significantly influenced the per capita GDP. Health expenditures have also positive but insignificant impact on economic growth. Whereas there is negative relationship of infant mortality rate, population per bed on economic growth. The major policy implication of this study is that by increasing the health facilities through increase the investment on health sector that will improve the sustainable level of economic growth.

Keywords: Economic growth, GDP per capita, Granger causality, Life expectancy

I. INTRODUCTION

Simple and important sense, health is wealth. Fitness is a most important element of overall welfare of human being with respect to all economical aspects. This is a rational statement that good health moves up to the level of human capital that causes the high per capita economic growth in any country. Robustness amplifies employee's abilities to do work and decreases the illness, disability and ratios of per day's sick leaves, and shrinks the individual better pay work that is obtaining by other opportunities. Furthermore, good health is useful to improve the level of education in school and academics performances.

The growth economists that have integrated human capital in the studies, rewarded superior notice on analyzing the impact of education on economic growth, whereas showed negligence in a case of human capital. It is not merely, current times that studies have started looking at health and tried to estimate the relationship among health and economic growth.

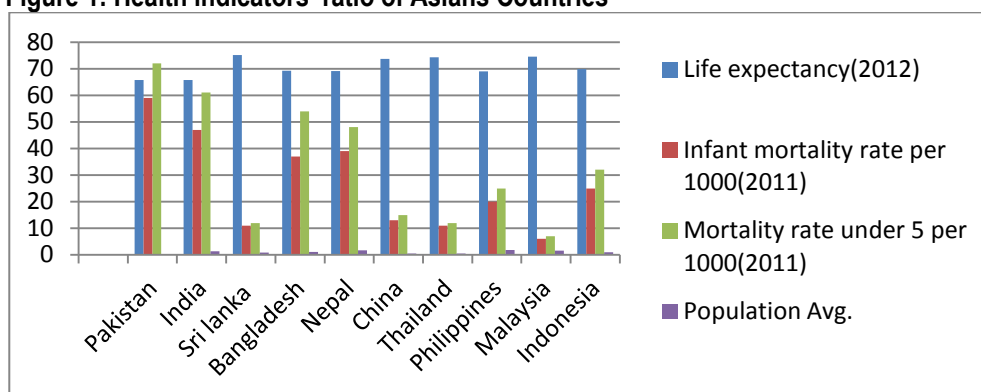
Decade of 1950's, Life expectancy rate in the developing countries was only 40 years and among these, 28 out of every 100 children pass away in the duration of 5 years and but in 1990's, Life expectancy raised from 40 years to 63 years. At the same time the child' death rate also has been minimized due to proper vaccination. Absolute levels of mortality in the less developed countries stay by mistake high, child mortality rates are about ten times high than those in the reputable market economics. Near about 400,000 women die in duration of pregnancy. Maternal mortality ratios are, on average 30 times high in the developing countries as in high-income countries but with the passage of time mortality rate also going down with the help of effective policies regarding health. In Pakistan, according to economic survey, investment in health sector is outlook as an essential part of the government's deficiency. Pakistan ranks unsuccessfully on this count. As a whole, life expectancy in Pakistan residue less than other developing countries, whereas, infant as well as maternal mortality rates was at peak.

The National Health Policy of Pakistan of 2009 was the key step towards health. It aims to do so by convey a set of basic health services for all by refining health manpower, get-together and using dependable health information to conduct program efficiency and plan, and measured use of rising technology. Pakistan is committed to convention these goals and upgrade new policy project of 2015. Through a major health programs and

strategies, it is expected to decrease, mortality rate to 52 per 1000, infant mortality rate to 40 per 1000, and maternal mortality ratio to 140 per 1000 in 2015.

In Pakistan, health status of population at large has improved significantly over time. Yet, by international evaluation, the status is mixed, but usually augmentation on this front has lagged in the case of Pakistan. Recent cross-country studies of important health indicators show a broad variation in epidemiological model among different Asian countries. Contrast with Bangladesh, India and Sri Lanka.

Figure 1: Health indicators' ratio of Asians Countries



II. ARGUMENTS OF DIFFERENT RESEARCHERS

Life expectancy is extensively simultaneous to successive economic growth. According to the estimates, 10% increment of life expectancy may possibly increase economic growth by 0.4% annually. (Robert Barro (1997)).

Health, education and income, these are really the three leader of human development. (UNDP, 1990) Death and health factor are not correlated with each other. It is not insecure whether life expectancy totally away the impact of health on economic growth, that a positive relationship among health and productivity for equally inexperienced and expert workers. Evans et al. (1994) analyzed that healthy persons are more capable and helpful about economic growth activities.

Economic growth and the importance of human capital are totally accepted in the active exogenous and endogenous growth hypothesis Grossman (1972), Bloom and Canning (2000) alternatively what is still debatable is that what cause is that factors should be measured as human capital. Equally economic progress results in improved nutrition,

better sanitation, innovations in medical technologies; all of these amplify the life expectancy and turn down the infant mortality rate. (World Development report (2007)).

In the same way, average life expectancy was only 40 years in developing countries in 1950. But now it had greater than before and increase from 63 to 65 years in 1990 (World Bank 1993). Preston (1976) has analyzed that a variety of determinants of life expectancy that effects the economic growth and highlight that economic maturity is key factor.

The healthcare services in Pakistan present a very unsatisfactory situation. It concluded that more about last 60 years, there is too much short expenditure on health. Health expenditure in Pakistan expenditures on health sectors remains at small collection that is 0.5-0.8% of GNP for the period of 1970-2007. Health expenditure was only 0.6% of GNP in 2006-2007.that is too less with compare the other developing countries.

In Pakistan, infant mortality rate was high at 77 per thousand live births; in 2006 life expectancy was less than 65 years, (Straus and Thomas 1998). In the below diagram health indicators from 1960 -2010 are summarized in such a way that

Table 1: International Description

Country	Life Expectancy	Infant mortality rate per 1000	Mortality rate under 5 per 1000	Population Avg. Annual(%) growth
Pakistan	65.7	59	72	2.03*
India	65.8	47	61	1.31
Sri Lanka	75.1	11	12	0.91
Bangladesh	69.2	37	54	1.18
Nepal	69.1	39	48	1.77
China	73.7	13	15	0.48
Thailand	74.3	11	12	0.54
Philippines	69.0	20	25	1.87
Malaysia	74.5	06	07	1.57
Indonesia	69.8	25	32	1.03

Source: Human Development Report(2013) UNICEF, * National Institute of Population (NICEF)

The central aim of this research is to find out that impact of health on economic growth. This study is exploring that how health expenditure, life expectancy, Infant mortality rate and Fertility rate create impact on economic growth.

III. LITERATURE REVIEW

A number of researchers conducted different studies to consider the connection between economic progress and Health. Following is an immediate review of some recent studies about Health and Economic growth.

Akram et al. (2006) examined the impact of different health indicator on economic growth in Pakistan. The co-integration, Error correlation model and granger causality techniques were applied. It was suggested that the impact of health on growth was only a long run phenomenon and in short run and there was no significant relationship exists between health variables and economic growth. Policy implication of this study was that if we desire a high level of per capital income, we will achieve it by increasing and improving the stock of health and human capital. The results showed that population per bed, age dependency and mortality were negatively related to economic growth whereas health expenditure, life expediency and trade openness has positive impact on per capita GDP.

Bhargava et al. (1990) investigated the effects of health indicators on economic growth. Life expectancy, child morality, adult survival rates, was used as independent variables to observe their impact on GDP growth. Panal data series were used for analysis. In this research paper on GDP series based on purchasing power adjustments and a GDP series based on official exchange rates and used several econometric methodologies. It was important to used two alternatives GDP series because of purchasing power comparisons.

Zon and Mysken (2001) were looked at the health sector along with endogenous growth theory on human capital formation and physical embodiment of knowledge in people. This study explored that, since the steady-state growth raised linearly in the average health-level of the population, the productivity of the health sector and it was considered as core determinant of growth. Growth may virtually withdraw for countries with high rates of decompose of health, low productivity of the health sector, or high rate of discount. If we observe the impact of health on longevity as an extremely, and find that the health sector was consistent with maximum economic growth.

Bloom et al. (2001) measured the effect of health on economic growth and also compared macroeconomics theories of growth with empirical evidences. Each nonlinear regression estimated by using the technique of ordinary least squares and all

contemporaneous growth rates of inputs were instrumented with their lagged growth rates. In this article researcher followed different models of economic growth to account two additional variables that micro economist were identified as fundamental components of human capital, work experience and health. There are various empirical studies define human capital solely in term of schooling. The main result was that good health has a positive and statistically significant effect on aggregate output.

Arora (2001) studied different aspects of health indicators, role of human capital and its contribution towards long term economic growth. This study explored the influence of health on growth trail frequently on industrialized countries over the period of 100 to 125 years. Changes in health expenditures increased rapid growth by 30 to 40 percent, in growth. The study was investigated that health is multifaceted and no single variable summarized it, especially at the aggregate level. Through number of variables represented all facets of health, several variables highlight particular aspects of it therefore researcher was used five other health related variables-life expectancy at birth and stature at adulthood to extend significantly the scope of that inquiry. The variables show remarkable changes over 125 year. Robert Engle and Clive Granger were used to estimate the non-stationary of the variables.

Bloom et al. (2004) estimated the effect of health indicators on economic growth” for this purpose of economic growth model incorporated two variables that microeconomic have identified as basic components of human capital; work experience and health. They were generating a panel of countries for experimental study of every 10 year over the period of 1960-90. Output data (GDP) was obtained from the Penn World tables. The result concluded that good health has a positive and statically significant effect on aggregate. By improving the education may increase output through labor productivity but also through the buildup of capital stock as well. The study was argued that life expectancy effect in growth regressions appears to be a real labor productivity effect, and was not the result of life expectancy performing as a proxy for worker experience.

Gauri (2004) examined with title of research paper as “social rights and economic growth: Claims to care and education in developing countries. In which author tried to evaluate accurate based and economic approaches to the provision of health care and education in upward countries. Differences included the consequences of long term

deficiency, and behavioral twist of subsidies. While the differences were not opposite and supporter of the approaches need not regarded each other as a competitor.

Rico et al. (2005) explored the empirical evidence about health and its impact on economic growth. This model was expected through a panel data investigation which comprised the growth rates of physical capital, labor, schooling and health indices that latter being expressed in their absolute level for the year 1970-80 and 1980-1990 with the method of ordinary least squares. The data was obtained from Penn world table. The variables that was used in the study was capital, labor, schooling, lifestyle, (which generate different health and behavioral problem related to overall health) environment (socioeconomic environment and physical environment) and health services, socioeconomic condition. Sample size was controlled from 52 to 72 countries. The health considered as a core factor showed significant impact on economic growth by using the technique of generalized least square (GLS). As a tool of macroeconomic policy, investment in health recovered the economic growth, was one indicator among few feasible options to destroy poverty traps.

Bloom and Canning (2005) investigated the impact of health on economic growth along with reconciliation of micro and macro evidences in which researcher estimated parameters by using least square method. The aim of this paper was to evaluate the microeconomic estimates of the effect of health on wages with the macroeconomic approximation of the effect of health on worker productivity. They originated that estimated macroeconomic effects of health were positive, and insignificant from the microeconomic estimates. Similarly study provided result for education and it device schooling levels with literacy rates to correct measurement error.

Weil (2006) focused on the effect of health on gross domestic product as proxy of growth and paper was published by National Bureau of Economic Research, in which researcher explored the microeconomic estimates of the effect of health on macroeconomic estimates. And observed the impact of health on GDP per capita, by using ultimate estimate, eliminating health differences among countries diminish the variance of log GDP per worker by 9.9 percent, and decrease the ratio of GDP per worker at the 90th percent to GDP per worker at the 10th percentile from 20.5 to 17.9. whereas this effect was economically significant and it was considerably less important than estimates of the health on economic growth that were derived from cross-country regression. Further he was

explore Several of these indicator channels, such the effect of better health in hopeful the accumulation of human and physical capital may possible were affirmative impacts on income that were a huge as the through channel.

Asia and Pueyo (2006) observed the government health spending and economic growth in a model of endogenous longevity in Spain in which they were present a model of endogenous longevity that was exhibited non-monotonic effect of government spending on economic growth. Meanwhile, the association between government spending and growth was measured to be negative relationship to each other; authors established a non-monotonic relationship when considered public health spending exclusively. The results showed affirmative effect of public health expenditure, life expectancy, saving on growth when it could equalize the effect of taking away resources from investment. The key element was that the effectiveness of visibly provided health care in improving life expectancy.

Abbas and peck (2008) was exploring the relationship among human capital and economic growth in Pakistan with aggregate time series data. The model was estimated with the Johansen (1991) approach and the fitted model was specify a significant role for human capital to enhance the economy's capacity to attract world technological progress

Hartwig (2010) was study on health capital formation and good long-term economic growth. In which a large body of both theoretical and empirical literature has declared a positive impact of human capital growth in the form of health on economic growth. The result was not providing sustainable view about health, capital formation foster long term economic growth in the OCDE area. No indication was found in OECD data that moreover health capital formation during health care expenditure or the rises in life expectancy cause per capital GDP growth. Life expectancy and GDP per capita has positive relation. On the other hand, when per- capital GDP growth was regressed on interval of per capita HCE growth in a panel Granger –causality testing framework, the coefficients for lagged HCE growth were strongly negatively associated.

Qadri and washed (2011) empirically examine “the human capital and economic growth, time series evidence from Pakistan. They explored that human capital was usually measured as a positive connection with economic *growth*. In this study, they estimated the regression by using time series data of Pakistan in period of 1978 to 2007. Health familiar,

education used as an indicator of human capital with the help of the standard Cobb-Douglas production function. The results verified that a long run affirmative relationship between human capital and economic growth in Pakistan. The health adjusted education indicator was created to be a highly considerable determinant of economic growth, which indicated that both the health and education sector should be given individually attention in order to make sure long run economic growth.

Aloi and Tournemaine (2011) examined a growth effect of environmental policy when population affected health sector clearly. This study developed a R&D based growth model with a population externality and a health production sector and showed how health spoil population, long term growth and the production reduction policy (tax). Researchers were amplification that tighter environmental tax has positive effects on growth by the use of two channels. On the one hand, it was enhanced workers health and thus productivity. The researchers further clarify that a tighter environmental policy could increase growth because it will bring not only improvements in health; hence better productivity, but also reallocation of recourses towards R&D, hence better intensity. Health preferences emphasized the effect on growth of a tighter environmental policy. The fact was that the overall rate of improvement environmental tax may involve utility achieve both in the short run and in long run.

Asghar et al. (2012) was analyzing the relationship between human capital and economic growth for Pakistan by using recent advances in dynamic modeling. The study was investigating causality between economic growth and human capital in Pakistan by using annual time series data for the period 1974-2009. ADF, PP and Ng perron test were applied to check the unit root problem in a series of data of included variables in a reserch. long run relationship were confirmed by Johannes and juselius co-integration test while the long run and short run dynamic were experiential by VECM specification, for model was be conventional through CUSUM and CUSUMSQ .it has significant positive relationship between human capital on economic growth. The results of the study participated significant for policy maker that for achieving goals. This study recommended that more education and health expenditures may cause significant impact on economic growth. Furthermore the ministries of education and health must lend a handsome amount in promoting an importance of health and economic growth.

IV. DATA AND METHODOLOGY

The Study is going to investigate linear relationship among health indicators and economic growth, by using the theoretical background of model as $Y=f(L, Inf, F, HE, P)$, in which Y is per capita GDP, L is a life expectancy, Inf, is an infant mortality rate, F is fertility rate, HE is total health expenditures, and P is population per bed (assumed to be proxy of Labor). The above equation shows that the economic growth depend upon life expectancy, fertility rate, population per bed, and health expenditures.

Life expectancy, fertility rate, health expenditure, has expected positive impact on economic growth whereas Population per bed, infant mortality rate will become negative.

A. DATA SOURCES

In order to find out the impact of health on economic several health variables can be used. Health indicators are converting into two categories; first one is health input indicators and second is health output indicators. Health input indicators include health expenditure on health sectors, accessibility and feature of health services etc. whereas health output indicator contain infant mortality rate, Life expectancy, Fertility rate and population per bed etc.

Table 2: Data Sources

Variables	Sources
Growth rate of GDP per capita	Hand Book of Statistics 2010
Life expectancy	World Development Indictor 2012
Infant mortality rate	World Development Indictor 2012
Health expenditure	World Development Indictor 2012
Fertility rate	Hand Book of Statistics 2010
Secondary enrolments	Hand Book of Statistics 2010
Investment % GDP	Hand Book of Statistics 2010
Population per bed	Hand Book of Statistics 2010

Conditional ahead and accessibility of time series data; some variables are used as a health indicators in this research that is life expectancy, fertility rate and infant mortality rate. Health expenditure as % of GDP is also using that most important output variables. The independent variables of the model are per capita GDP is used that is use as a proxy for economic growth. Readily available are definite other descriptive variable the data of all the variables is used ranging from 1980 to 2012.

B. ECONOMETRIC METHODOLOGY

This study used Ordinary Least Square (OLS) and Granger Causality test to observe the impact of health on economic growth. Annual time series data were used and sequence of analysis will be carried out as;

UNIT ROOT TEST

This test is used to check the stationary of the data. If probability distribution of data remains unchanged as time go on then data can considered stationary. There are different types of tests to check unit root such as Phillips Perron, Dickey Fuller GLS (ERS) and NG-Perron but Augmented Dickey Fuller (ADF) test is the most commonly used to check the stationary of the data. So, the study employed ADF test.

Unit root test is used to verify endure data is stationary or not. A series of data is considered as stationary if its probability distribution remains constant as time proceeds and it means that data invention procedure does not changed. To test the unit root generally used test is Augmented Dickey Fuller (ADF) test. If all variable are at level then OLS technique are useful on the other hand if all variables are at first difference then Johansen co integration technique is applied. The common form of ADF test can be written at level form as follows.

ORDINARY LEAST SQUARE METHOD (OLS)

Ordinary least-squares (OLS) regression is a generalized linear modeling method that may be used to model a single response variable which has been recorded on at least an interval scale. The method may be applied to single or multiple explanatory variables and as well categorical explanatory variables that have been properly implicit. OLS has following properties;

1. It is linear estimator
2. It is unbiased; if Intercept is incorporated and omitted variables are uncorrelated with included variables.
3. An estimator is efficient if it is unbiased and it has minimum variance.
4. Variance becomes smaller when, more variables are included.
5. It measures the goodness of fit.

GRANGER CAUSALITY

The concept of causality formulated in 1969 by Clive Granger, based on past paper by Wiener (1956), is mainly popular in the econometric literature. Granger Causality test help out to influential the way of causal relationship between different variables. To test the causality relationships following model is used.

$$Y_i = \sum_{i=1}^k \alpha_i x_{t-i} - \sum_{i=1}^n \beta_i y_{t-i} + \delta_t$$

$$X_i = \sum_{i=1}^k \gamma_i x_{t-i} - \sum_{i=1}^n \rho_i y_{t-i} + \epsilon_t$$

Where δ_t and ϵ_t are two white noise series and k is maximum number of lags. Granger causality is very sensitive with number of lags used. Four findings are possible in Granger Causality test

- Neither variable 'Granger Causes' other
- Unidirectional Causality from x to y but not vice versa
- Unidirectional Causality from y to x but not vice versa
- Both variables cause each other

C. MODEL SPECIFICATION

The Observed growth model can be written model developed can be written in the following form as;

GDP per capita = f (life expectancy, infant mortality rate, fertility rate, health Investment, health expenditure, secondary enrollment, Population per bed)

To conclude the impact of health on economic growth, Econometric model is;

$$Y = \beta_0 + \beta_1 FR + \beta_2 POP + \beta_3 IMR + \beta_4 LE + \beta_5 INV + \beta_6 HE + \beta_5 SE + U_t$$

Here, Y represents Per Capita GDP, FR shows Fertility Rate, IMR stands for Infant Mortality Rate, LE describes the Life Expectancy, HE is the abbreviation of Health Expenditure % of GDP, INV is Health Investment in % of GDP, SE belongs to Secondary Enrolment and POP is Population per Bed.

V. RESULTS AND DISCUSSION

Model estimation begins with the analysis of the order of integration of each variable using Augmented Dickey Fuller (ADF) test for this investigation. The null hypothesis for this testing is that the series enclose unit roots and the results for ADF test are reported in table 3.

A. RESULTS OF ADF TEST

The table 3 results expose that all dependent and independent variables is stationary at level which is the first step of time series analysis. So we reject the null hypothesis of unit root at level.

Table 3: Results of ADF Test

Variables	Levels		
	Intercept	Trend and intercept	None
Per Capita GDP	-4.490 (0.0012)	-2.529 (0.3129)	-12.704 (0.000)
Health expenditure	-2.263 (0.4401)	-3.982 (0.0220)	-3.366 (0.9999)
Life expectancy	1.290 (0.9980)	4.566 (1.000)	-3.087 (0.0032)
Fertility rate	-4.759 (0.0008)	-3.380 (0.0768)	-1.1949 (0.2051)
Infant mortality rate	0.0910 (0.9591)	-3.670 (0.0392)	-1.787 (0.070)
Investment % of GDP	-2.655 (0.0921)	-2.761 (0.2241)	-0.512 (0.4861)
Secondary Enrolment	-4.023 (0.0050)	-0.970 (0.9301)	4.083 (0.999)
Population per bed	-1.262 (0.6341)	-2.263 (0.4400)	-10.61 (0.0900)

Note: (Parenthesis shows probabilistic values)

B. RESULTS OF ORDINARY LEAST SQUARE (OLS)

The table 4 indicates that Fertility Rate creates positive and significant impact on GDP whereas health expenditure is also recommended positive but insignificant effect on economic growth. Mortality rate has negative and significant impact on economic growth. When (Input variables) health facilities increases in any economy then Infant mortality rate will decrease as a result GDP growth will be improve. Life expectancy has significantly impact on Per Capita GDP. Life expectancy has positively related with the economic growth. Investment and population Per Bed comprises significant impact on economic

growth. Investment is positively related with the economic growth. Its means when investments on health sector will increases then economic growth will also perk up.

Population per bed is harmfully affected the economic growth. When population per bed enlarges, it means that smaller amount health facilities are available to the people, and then this condition will absolutely create harmful impact on economic growth in the long run. Secondary enrolment has insignificant but positive relation with the economic growth. Its mean that more well-informed nation's workers, superior their possible to get closer to with general technologies and to attain the economic growth. There is no auto correlation problem in this model according to durbin watson value and overall performance of the model is good because model explained 77% variation.

Table 4: Results of OLS estimation

Variables	Coefficient	Std. Error	T-Statistic	Probability
C	39731.68	1015.272	39.13405	0.0000
FR	177.5164	26.14664	6.789265	0.0000
HE	3.766909	2.950506	1.276699	0.2134
IMR	-1048.857	52.26698	-20.06730	0.0000
LE	6288.127	308.7510	20.36634	0.0000
INV	6.652012	1.445466	4.601983	0.0001
SE	9.044883	11.94064	1.757487	0.4558
POP	-1479.352	46.96163	-31.50130	0.0000
R-squared	0.769947	Durbin-Watson stat	2.011411	
Adjusted R-squared	0.761456	Prob(F-statistic)	0.000000	

C. RESULTS OF GRANGER CAUSALITY TEST

Results of table 5 are indicating that there is a unidirectional Casual relationship between populations per bed, health expenditure, GDP per capita. On the other hand, there is no causal relationship among the Investment and secondary enrolment and GDP per capita. Above results expose that health output variable e.g. life expectancy, mortality rate causes the per capita GDP. Whereas a most important input variable Investment variable does not cause per capita GDP. Per capita GDP cause Fertility rate and Mortality rate.

Table 5: Results of Granger Causality

Null Hypothesis	F Stats	Prob.	Direction of Causality
GDP per capita does not Granger Cause Fertility rate	4.20412	0.02618	GDP per capita →fertility rate
Fertility rate does not Granger Cause GDP per capita	0.61176	0.55002	

GDP per capita does not Granger Cause Health Expenditure	1.73837	0.19564	Health Expenditure →GDP per capita
Health Expenditure does not Granger Cause GDP per capita	2.60016	0.09343	
GDP per capita does not Granger Cause life Expectancy	5.68613	0.00894	GDP per capita →life Expectancy
Life expectancy does not Granger Cause per capita GDP	1.46531	0.24946	
GDP per capita does not Granger Cause infant mortality rate	4.02319	0.03004	GDP per capita →mortality rate
Infant mortality rate does not Granger Cause per capita GDP	1.15791	0.32982	
GDP per capita does not Granger Cause investment % GDP	0.01295	0.98714	No Relationship
Investment % of GDP does not Granger Cause per capita GDP	0.17221	0.84275	
GDP per capita does not Granger Cause Secondary Enrolment	1.79353	0.18535	No Relationship
GDP per capita does not Granger Cause Secondary Enrolment	2.0514	1.14879	
GDP per capita does not Granger Cause Population Per Bed	0.85905	0.43524	Population per bed →GDP per capita
Population Per Bed does not Granger Cause GDP per capita	4.84924	0.04392	

VI. SUMMARY AND CONCLUSION

The core purpose of this study is to investigate the Impact of health on economic Growth. To achieve that objective ordinary least square (OLS) and Granger Causality method are used on the time series data of Pakistan for the period of 1980-2012. The OLS results verify that health variables play a very important role in decisive the economic growth. Since all the health indicators have a significant impact on the economic growth. Fertility rate has positive and significant impact on GDP per capita. Whereas health expenditures also positive but insignificant impact on per capita GDP .its means increases the health expenditure economic growth will be enlarge. Results investigate that Infant Mortality rate has negative but more significant impact on per capita GDP. Life expectancy and investment has positively related with the economic growth.

Life expectancy significantly affects the per capita GDP. Life expectancy and investment are correlated to each other. By increasing the investment on health sector we can improve the health facilities as a result life expectancy can be increased, that pick up the economic growth. Secondary enrolment has insignificant but positive relation with the economic growth. Its mean that more well-informed nation's workers, superior their possible to get closer to with general technologies and to attain the economic growth.

Population per bed is relatively significant and negatively related with per capita GDP. When population per bed increases, it means that smaller amount health amenities are available to the people, and then this condition will absolutely affects economic growth in the long run.

The Granger Causality result shows that health expenditure and Population per bed causes per capita GDP to be changed. Fertility rate, Health expenditure, Life expectancy, Mortality rate and population per bed have unidirectional relation with economic growth. But secondary Enrolment and investment have no causal relationship with per capita GDP. GDP per capita causes mortality rate, Fertility rate and life expectancy.

The policy implications of this study are that by increasing the health facilities through increases the investment and health expenditure we can recover the GDP per capita. The studies recommend that to attain the great and continual economic growth there is require enlarging investment in both public and private health sectors. More and more funds as percentage of GDP might be allocated for health segment in line with other sectors. Government should enlarge the health expenditures as a percentage of GDP. The Ministries of Health should collaborate in encourage the substance of health and distribution health care information to the people on priority basis.

REFERENCES

- Aisa, R., & Pueyo, F. (2006). Government health spending and growth in a model of endogenous longevity. *Economics Letters*, 90(2), 249-253.
- Aloi, M., & Tournemaine, F. (2011). Growth effects of environmental policy when pollution affects health. *Economic Modelling*, 28(4), 1683-1695.
- Arora, S. (2001). Health, human productivity, and long-term economic growth. *The Journal of Economic History*, 61(03), 699-749.
- Asghar, N., Awan, A., & ur Rehman, H. (2012). Human capital and economic growth in Pakistan: A cointegration and causality analysis. *International Journal of Economics and Finance*, 4(4), p135.
- Barro, R. (1991). Economic Growth in a Cross Section of Countries, *Quarterly journal of Economics*, Vol. 106.
- Barro, R. J. (1991). Economic growth in a cross section of countries, *Quarterly Journal of Economics*, No 106, mayo.

- Bhargava, A., Jamison, D. T., Lau, L. J., & Murray, C. J. (2001). Modeling the effects of health on economic growth. *Journal of health economics*, 20(3), 423-440.
- Bhargava, A., Jamison, D. T., Lau, L. J., & Murray, C. J. (2001). Modeling the effects of health on economic growth. *Journal of health economics*, 20(3), 423-440.
- Bloom, D. E., & Canning, D. (2005). Schooling, health, and economic growth: reconciling the micro and macro evidence. unpublished, Harvard School of Public Health (February 2005).
- Bloom, D. E., Canning, D., & Sevilla, J. (2001). The effect of health on economic growth: theory and evidence (No. w8587). *National Bureau of Economic Research*.
- Bloom, D. E., Canning, D., & Sevilla, J. (2004). The effect of health on economic growth: a production function approach. *World development*, 32(1), 1-13.
- Bloom, D. E., Canning, D., & Sevilla, J. (2005). Health and economic growth: reconciling the micro and macro evidence. Center on Democracy, Development and the Rule of Law Working Papers.
- Drury, A. C., Kriekhaus, J., Lusztig, M. (2006). Corruption, Democracy, and Economic Growth. *International Political Science Review*, 27(2) 121-13
- Fogel, R.W., 1994. Economic growth, population health and physiology: the bearing of long term processes on the making of economic policy. *American Economic Review*, 84, 369-395
- Hartwig, J. (2010). Is health capital formation good for long-term economic growth?—Panel Granger causality evidence for OECD countries. *Journal of macroeconomics*, 32(1), 314-325.
- Mayer, D. (2001). The long-term impact of health on economic growth in Latin America. *World development*, 29(6), 1025-1033.
- Murray, C. J., & Chen, L. C. (1992). Understanding morbidity change. *The Population and Development Review*, 481-503.
- Preston, S.H. (1975). The Changing Relation between Mortality and Level of economic Development. *Population investigation Committee*, 29(2), 231-248
- Qadri, F.S., waheed, A. (2011). A Human Capital and Economic Growth: Time Series Evidence from Pakistan. *Pakistan Business Review*, 86, 815-833
- Strulik, H. (2008). Geography, Health and the Pace of Demo-economic Development. *Journal of Development Economic*, 86, 61-75
- Stuckler, D., Basu, S., Mckee, M., SUHrcke, M. (2010). Thesis Responding to the Economic Crisis: A Primer for Public Health Professionals. *Journal of Public Health*, 32(3), 298-306
- Weil, N. D. (2005). Accounting for the effect of health on economic growth. NBER Working Paper series.
- Zon, A.V., Muysken, J. (2001). Health and endogenous Growth. *Journal of Health Economic*, 20, 169-185.