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Impact of Government Expenditure on Health Sector of Pakistan

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Abstract
Health is very important for human being which determines the productivity of individual and leads the country towards targeted economic growth. This paper studies the impact of government expenditure on health sector of Pakistan. Over the period 1990-2012. ARDL technique is used for examining cointegration among variables. The impact of different factors in form of infant mortality rate government expenditure % of GDP, improved sanitation facilities and literacy rate over health sector of Pakistan (crude death rate, crude birth rate) is analysed. The empirical evidence shows that infant mortality rate has a positive relationship with crude death rate whereas improved sanitation facility and government expenditure has negative relationship with crude death rate. Infant mortality rate has a positive relationship with crude birth rate, literacy rate has a negative relationship with crude birth rate and government expenditure has a positive relationship with crude birth rate. These empirical findings suggest that health sector can be improve if the sanitary facilities are improved, better education can reduce infant mortality rate. This could be done if the government expenditure is utilized in an effective and transparent way.

Keywords: Economic Growth, Government Expenditures, Health
JEL Codes: F43, H50

I. Introduction

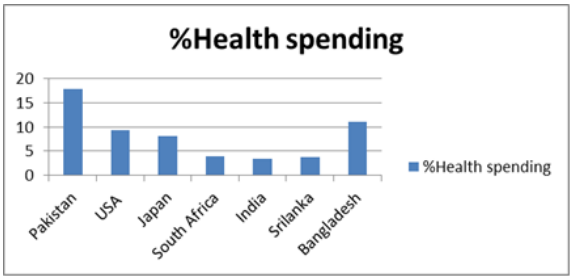
Health is an important constituent of life; it is a blessing bestowed by God Almighty. Health is of great importance at workplace, in a society at every step of life because a healthy environment would lead to fruit full results in every aspect of life. If a person is healthy he/she would attain better education and get good job which in return give better earnings. A healthy individual would lead a welfare society. The paper aims to study the impact of Government expenditure on health sector of Pakistan, on the basis of quantitative facts been collected. To analyse the health sector some of the health indicators such as crude birth rate and crude death rate are been determined (Todaro,2007).

I.I. Global perspective

Life expectancy rate can be determined from crude birth rate which is average births per 1000 in a year and crude death rate is average deaths per 1000 in a year. Life expectancy is the average number of years an individual life from the day of his birth. The year of an individual's life can be increased and can be made better off by providing better medication and by providing better vaccination to protect the individual against diseases (World Bank, 2016).

Health expenditure comparison of different counties:

Figure 1.1 Health Spending by Government



Source: SAARC Journal of Human Resource Development (2013).

Figure 1.1 depicts that in case of India, Sri Lanka and South Africa spending stands at less than 4 percent whereas Pakistan spends about 18% which is greater than USA which spends about 10% on health. It can be observed that the recipe to sustain economic growth is by looking into the level of investment in human capital by the developed economies in comparison with the developing economies like South Asia. Expenditure on health is 86.8 percent in Pakistan which is higher than Sri Lankan and Nepal in South Asia. While per capita expenditure of health on an individual in Pakistan is only US $34 in a year which is second lowest in South Asian as Bangladesh has the lowest per capital expenditure of US $26. Interestingly, in the respect also a tiny country of Bhutan stands first spending US $90 per year as per capital expenditure on health while Sri Lanka is second which spends US $88 per year.

I.II. Budget Allocation on Health Sector

Government of Pakistan have allocated a huge amount for health sector in the budget but was reduced when the budget was implemented. According to economic survey of Pakistan Rs 9863 million were set for health sector but latter itis revised budget and reduced to Rs 9437 Million (Economic Survey,2015). This budget was to be spent over the establishment of hospitals, provision of better institutions and provision of better paramedic's staff. The further division of budget at provinces level the share of health sector in budget of Sindh has mainly remained around 7 to 9 percent despite increase in the population as well as increase in many epidemic diseases. It was 8 percent in 2008-9 and 2009-10, however, it came down to 7 percent in 2010-11 and was increased to 8 percent during 2011-12 and 2012-13. However, the 9 percent share of health budget has remained constant during three fiscal years of 2013-14 to 2015-16. The faster increase in population causes an increase in demand of resources which also have an affect over the health services. Punjab increased Health Budget as Compared to previous year. Government Increased 4.5 Billion Rupees for Health Projects and also issued statement of 1.82 Billion for Free Medicines. Government Spent 1.44 Billion Rupees on health during 2015-16. Government announced to start 8 Health Projects of 2.5 Billion rupees in Punjab, 1 Billion for Hospital, 1 Billion for Mobile Health Services, and 3 Billion for Kidney & Liver transplant and Research Centre Lahore Pakistan. Government also announced 10,000 New Jobs for Doctors in Punjab. In Baluchistan 70 vaccination centres were to be set up across the province and Rs1billion was allocated for the purchase of equipment for government-run hospitals for 2014-2015. Similarly, Rs1.24 billion has been allocated for the provision of free medicine to patients across Baluchistan. Khyber Pakhtunkhwa have proposed Rs24 billion for health sector (Ministry of Finance, 2014).

I.III. Health indicators

Socio-economic and political factors play a significant role in distribution of health resources in Pakistan. The number of doctors and nurses are increasing in Pakistan, but they are not used efficiently and purposely used. Pakistan while planning does not take into account the environmental factors, nor the institutions consider the interdependence of man, resources, environment and development which can help to provide better facilities which would provide welfare to the nation (Siddique,1996). Currently in Pakistan for year 2015 the "crude death rate", "crude birth rate" and "life expectancy rate" are following:

Table 1.1 Current Facts and Figures

Crude Birth Rate (per thousand)	26.1
Crude Death Rate (per thousand)	6.80
Life Expectancy (years)	66.5

Source: Pakistan and Gulf economist (2015)

Table 1.1 shows that the average life expectancy of an individual is 66.5 years and the number of birth per 1000 is 26.1 percent in Pakistan and the death rate per 1000 is 6.8 percent.

I.IV. Problems of Health Sector

World Health Organization (WHO) is an organization which looks after the provision of the health facilities in developed and developing countries. Developed countries provide aid to the developing countries who fail to provide its citizen with basic health facilities (Todaro,2007). Many new vaccinations have been discovered in order to protect the people from the painful diseases. Every government has the responsibility to provide its citizens with the all basic necessities of life such as shelter education, health and the provision of food to eat and clean water to drink. According to Population association of Pakistan the rural areas face the problems to get access of safe drinking water as in urban areas people have taps in and outside the houses whereas the rural people have more of motor pumps, dug well and water from canal, river etc. which does not give them safe and clean water. This leads to increase in disease rate in rural areas. According to world bank (2010) Pakistan is eighth country in the ranking in which one of ten children born from 2001-2007 died before reaching the age of five years, one of 80 women die due to their bad maternal health during their pregnancy. One in every five individuals is malnourished or faces the deficiency of vitamin A or iron.

I.V Facilities for upgradation of Health

The government allocated Rs9.9 billion for health affairs and services for the health sector. This amount has been allocated for the 17 ongoing schemes and one new scheme will start with these funds. According to PSDP (2010), an amount of Rs2.8 billion has been allocated for the Program on Immunization, Reduction of Diarrheal Disease and National Institute of Health, Islamabad. 4.1 % fertility rate, contraceptive prevalence rate of 30% the population growth rate of 1.8% the malarial parasite incidence of 0.07% and incidence of TB of about 0.18% shows importance of health sector (Ministry of Finance, 2010).

Table 1.2 Provision of Health Facilities

Personal Health Facilities	
Basic health units	5171
Rural Health Care	531
Mother and child health centers	856
Medical Service Unit	131
Hospitals	876
Dispensaries	4635
Private Health Establishments	29,73,650

Source: Population Association of Statistics, (2002)

Table 1.2 explains that Pakistan focuses on large primary health care infrastructure. However, due to high population growth, the number of beds, doctors and nurses per person is still not meeting the required population needs. Health care system remains in crisis in Pakistan only 27% of population enjoys reasonable health care facilities (Antonia Settle,2010). The birth rate is showing decreasing trends because of the increase in the literacy rate and increase in women empowerment. Health programs are launched to make people aware

about the health protection and health cares**.** The government gets a large amount of aid which it is ought to be utilized in proper way whereas Pakistan has always lacked to use it in proper way because health is the basic unit which leads to the growth of the nation. Currently, a large part of rural Pakistan does not have better health facilities due to less the number of hospitals, doctors, paramedic staff, medicines etc. in the rural areas is less than demand of individuals. This is due to lack of government's attention towards health in rural areas. Doctors do not prefer going to underdeveloped areas due to which the people are forced to come to urban areas to seek treatment but to get this treatment the individuals face budget constraints.

I.VI. Programs to improve Health Sector

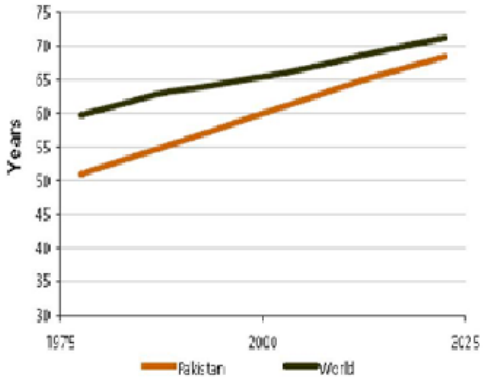
In some case government also contributes in social security benefits by providing financial support at times of sickness, child delivery, old age support. Pakistan Bait –ul- Maal plays a significant contribution towards providing financial assistance to poor widows and orphans for medical treatment, a family who has 2 or more disable children is given 25000 Rs annually (Economic Survey of Pakistan,2007). Pharmacy benefits management also provides grants and aids to the registered organizations to help the poor and deserving people. In past there were many diseases which had no treatment which became a cause of death of many people, but with the scientific discoveries of many vaccines and medicines the people were protected against many diseases. Recently many new activities have been initiated to make people aware about the ongoing diseases and its symptoms and some precautions to protect themselves against them such as the polio campaign started to give two drops to each child under the age of 5 to protect them against the disastrous disease another campaign started was the breast cancer awareness program which made the women much aware that they took precautionary measures themselves and even spread the message to protect the society and lead a welfare society. Government aims to take steps which are for the welfare of the society because it's the government's responsibility to provide the maximum utility to its citizens (Pakistan Institute of Development, 2007).

Government initiated the programs like National Maternal and Child Health Program, the Cancer Treatment Program, and the HIV/AIDS Control Program. Health nutrition & HIV/ AIDS program's provide education that ensures individuals to have knowledge and resources to lead a healthy life. Benazir Income Support Program gave health insurance to poor individuals (World Bank, 2011). Programs to control TB and to control tobacco usage were initiated; programs to control AIDS. National TB program treated 70 thousand TB patients with free diagnosis and treatment. The directorate of malaria control had the initiative to reduce 50% of Malarias burden in Pakistan till year 2010, greater than 70% would be awarded about the preventions and treatment against the diseases till 2015. The program for family planning and primary care was initiated to give awareness to the people in order to take protective steps to reduce the population and plan population for proper health. This program served 96,000 people of different communities. The expanded program on immunization was initiated which aimed to protect children in their childhood against TB, Polio, Diphtheria, Pertussis, Measles, Tetanus and also protected their mothers against Tetanus. The national Maternal, Neonatal and Child health program started which aimed to improve the accessibility and quality of health services and fill the resource gaps without replicating inputs and activities. The national program for prevention and control of Hepatitis initiated vaccinated 400,000 persons through this program and 104 hospitals were well equipped to provide free treatment to the patients. CDC took steps to prevent meningitis and pneumonia among young children, it also aims to determine the viral and bacterial causes of neonatal infections, and it also gives the plan to protect against bacterial diseases. Recently the World Bank has issued $ 100 Million for the reforms in health sector of Punjab as Punjab constitutes the greatest part of population and plays an important role in all activities of country. Pakistan Bureau of Statistics (2010).

I.VII. Foreign Assistance for health

Many developed countries provide health assistance in shape of foreign aid to developing countries. The relationship between health aid, government spending and in life expectancy is positive because when aid from the developed countries increases as the developing countries are not self-sufficient they cannot grow up without the support of strong economies or strong powers this would increase the government spending on the awareness programs like workshops, seminars, media ads, newspaper articles, pamphlets and banners etc. the increase in the laboratory that can help in the detection of the deficiencies of different components of an individual, detection of diseases or the provision of new public hospitals including the doctors which can guide the individuals this would in return increase the life expectancy of individuals.

Figure 1.2 Life Expectancy rate 1975-2025



Source: Global Economy (2013)

Figure 1.2 depicts that all the developed countries have increasing rate of life expectancy whereas Pakistan have a fluctuating life expectancy rate but it has improved in recent years because of the availability of health facilities. Therefore, the standard of the facilities in developed and developing countries may not be the same but to a large extend the aid provided by the developed countries in form of financial assistance and the moral support has helped Pakistan to achieve a bit of its life expectancy rate. The government has the responsibility to protect its every individual's life.

I.VIII. Impact of Education on Health

Education is not providing its due reward especially in backward areas. Fresh doctors are not given salaries as per their education. The strikes by young doctors are the consequence of this injustice to them; spending days on the streets raising their voices against the atrocities of inequality.

Table 1.3 Number of Recognized Medical Colleges

Province	Public	Private	Total
Punjab	18	30	48
Sindh	9	14	23
KPK	8	9	17
Baluchistan	1	1	2
AJ&K	3	1	4
Total	39	55	94

Source: Pakistan medical and dental council (2015)

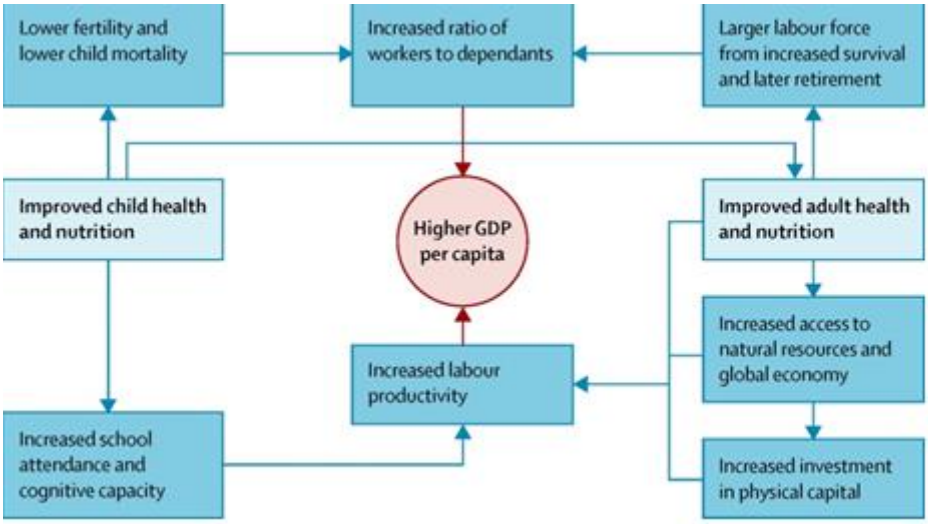
Table 1.3 shows the total number of medical colleges in Pakistan is 94. The total seats are 42000. The candidates compete for 3,405 medical seats and 216 dental seats in 17 public medical colleges and three public dental colleges, and around 3,000 MBBS seats and 700 BDS seats in 28 private medical colleges and 12 private dental colleges. This shows that seats and number of institutes are less and no of doctors are remained less for population.

I.IX. Effect of GDP Per Capita

In Pakistan government expenditure, number of hospitals and per capita expenditure on health has a negative impact on "crude birth rate" and "crude death rate" (World Bank, 2014). As the budget by the government is not allocated properly and the funds are used for other purposes which causes degradation of health sector.

Figure 1.3 depicts that the better child health increases school attendance of child which would further increase the labour productivity and the per capita GDP. Better allocation of natural resources would be better for national and global economy. This depends on the way how investment is made on physical capital that is why wise skills and management is needed for efficient resource allocation otherwise it would increase the scarcity of resources.

Figure 1.3 Per Capita GDP

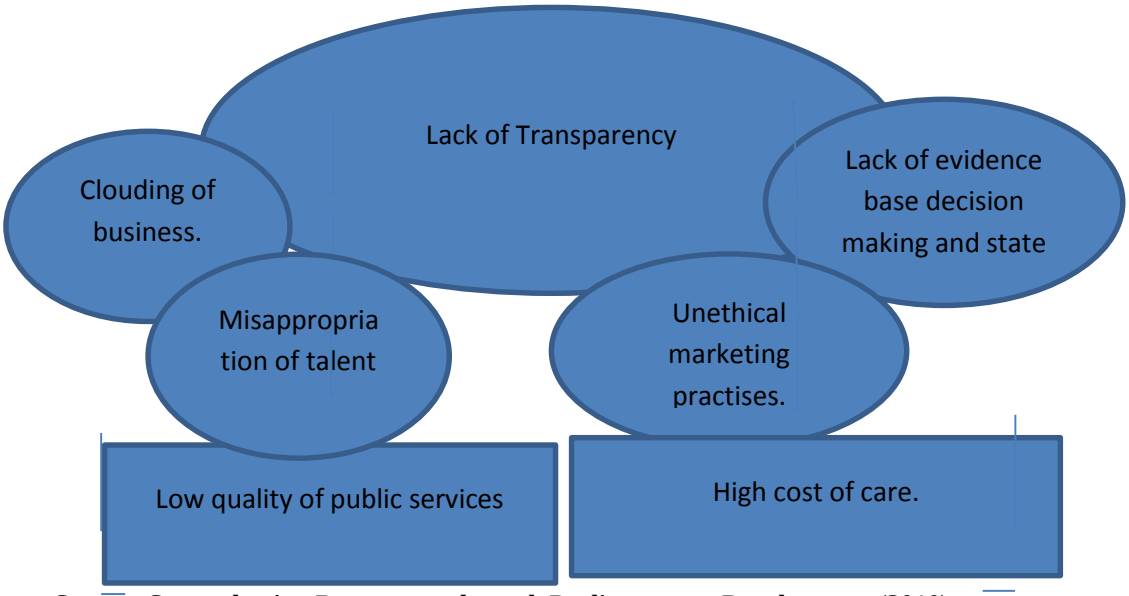


Source: The Lancet (2013)

I.X. Problems of Health Sector

Health sector faces a number of problem but the most serious problems which health sector faces which leads it towards deterioration is follows: Equality and quality in health delivery is undermined of health facility

Figure 1.4 Problems of health sector



Source: Strengthening Democracy through Parliamentary Development (2010).

Figure 1.4 shows that in health care sector of Pakistan as there is political influence there is lack of transparency the workers they are not loyal or committed to their work. The freshees those who are appointed are mostly not so professional that they do not have enough grips over their field which causes a problem for them while treating the patients. The funds are not properly transferred that could even help in provision of better hospitals, better medicines. The rate at which the services are provided is so high that it is not affordable by people belonging to low income group. The infrastructure and facilities of government hospitals are not up to the mark that can even increase infection in the patients and they can suffer due to it. Due to low returns even many doctors do not come to their jobs. Many doctors favour practising privately rather than working in government hospitals

I.XI Reforms in Health sector

Pakistan, has emphasized on provision of health care services. Steps should be taken to make health system effective and efficient. At the same time, emphasis must be placed on the provision of improved safe drinking water, and healthy environment. The regional health boards should receive funds according to their population they should have the freedom to generate new resources for health care. Social insurance schemes can also be introduced in order to provide protection to human lives.

II. Literature Review

Rashid, et al., (2014) stated in that Pakistan received massive foreign aid to improve the social and economic condition of society. Government has launched different population programs through foreign aid. This study analyze the fertility rate in Pakistan. The data is collected on fertility rate, prices, birth rates, foreign aid, female literacy rate and the lady health programs and the basic health units from economic survey of Pakistan. The auto regressive model is used to find the relationship between foreign aid and its utilization in health sector. The results show that foreign aid is positively related to fertility rate whereas after testation it is proved that they are negatively related in Pakistan and prices are negatively related to fertility rate. The increase in female education decreases fertility rate.

Ramzan (2014) stated that many people pay a great focus over protection and safety of their health whereas many factors such as transportation and land use planning causes hazards to health. Health improves productivity of labor force which improves economic growth leading towards welfare of individual. Literacy rate and GDP growth has a positive relationship with health growth. The data on infant mortality rate, water borne diseases malnutrition and unhealthy dietary habit, life expectancy and from WDI population growth are collected. The relationship between the health indicators and economic growth is been analyzed. Meghani, et al., (2014) highlighted that federal government is planning to formulate national policies on research, foreign assistance and training to advance the nation. Presently government is focusing on advancing technology but is not paying any attention to improvement of health sector. Quantitative data on total expenditure on health by government, GDP, GNP and foreign aid was used to analyse tertiary health care in Pakistan. Health shocks can various problems such as increase in diseases, unemployment, poverty etc. Appropriate administration and observation of healthcare system has been recommended.

Shaikh et al., (2013) stated that there are discriminations in health care delivery and access in recent reforms. Health system has insufficient finance, resources are misallocated and health services are mismanaged. The indicators of health in Pakistan presented high population growth rate, high infant and maternal mortality, and high incidence of low birth weight babies. Empirical data shows that a large proportion of budget of health sector goes to non-developmental fund and expenditures. Both systems of medical education and government fail to inculcate the moral responsibility among young doctors to go and serve the rural and un-served segments of population. Pakistan still represents noticeable health inequalities among poor and rich, Human resource policy for primary health care must be strategized, developed and implemented according to socio-cultural dynamics of the respective communities.

Bashir et al. (2012) stated that education and health are essential for development of an economy. It increases productivity, economic growth and employment level. When all facilities of health and education are provided to people it eliminates the disparities and provides employment in long run and short run. The data on education expenditure, total enrollment, number of hospitals, health expenditure and employment level used to find the relationship of health education and employment. Education increases the human resource development. A good health is necessary for a good life. The ordinary least square method, granger causality test, chi square tests, co-integration model and the employment model are used to test the relationship between employment, education and health. The results state that there is positive relationship among education, health and government expenditure in long run. The government expenditure on health and education in form of investment would increase the employment in Pakistan.

Valeecha and Reza (2012) stated that structural loans had a great affect over the health conditions and the economic growth of the country. Regression is used to determine relationship of structural loans, government expenditure and health indicators that include infant mortality rate. The multi collinearity, heteroscedasticity, coefficient of determination and auto correlation amongst the variables are tested. The ordinary least square techniques are used to determine the relationship among variables. The relationship of per capita income, government expenditure on health, worker remittances and structural adjustment loans are examined. The results show that there is a positive relationship between structural adjustment loans and health indicators. The equitable distribution of wealth is main aim of government as it would in return increase economic growth.

Drabo and Ebeke (2010) stated that in developing countries there is an impact of the foreign remittances on the health care services. The quantitative data on per capita income, foreign remittances, and health aid per capita were calculated to show results that increase in foreign remittances would increase the health services in poorer countries, the second results show that increase in foreign remittances and government expenditure in low income countries can benefit and can increase the health provision facilities. The foreign remittances play a vital role in the provision of health facilities in all layers.

Ahmed (2009) stated that fertility rate increase with employment and increase in use of contraceptives reduced fertility rate. It is in interest of political democratic governments to own such massive initiative and ensure the achievement of replacement level fertility in foreseeable future. Utmost attention should be given to human resource development to eliminate the intellectual gap at the senior management level and for smooth operational implementation. Pakistan's demographic transition, started through declining mortality has occurred relatively late compared to the developing countries of the world as slower change in fertility rate maintained growth profile relatively high. The fast declining mortality resulted in enhanced life expectancy while a wide gap between declining mortality and high fertility, though instrumental to high population growth rate, gave a youthful profile of Pakistan's population. The increase in woman empowerment and status gave them a sense to reduce the fertility rate.

Shirazi and Ali (2007) stated that foreign aid in Pakistan is used for saving, trade and investment gap's financing. The trade brings development by reducing poverty and improving standard of living. The aid is provided in form of emergency reliance, technical assistance and project aids. Many studies have ended up with conclusion that foreign aid brings a small increase in the investment expenditures but minor reduction in health and education expenditures. The impact of aid on growth and development is inconclusive by some authors.

Akram and Khan (2007) mention that GDP Per Capita is positively influenced by health indicators in long run. They state the higher income per capita is a desire of each individual which can be achieved by increasing the stock of human capita. The human capital includes health, training, migration and education which enhance the productivity of the individual. The relationship between health and GDP Per capita is in two ways (I) the health and other forms of physical human capital increases the GDP Per Capita by increasing the productivity of already existing resources and accumulating the new technical changes. (II) The economic growth improves the sanitation system, brings innovations in the medical technologies which increases the life expectancy and reduces the infant mortality rate. The method of co-integration, casual model and error correction model is used to find the relationship between the variables. There exists a uni-directional causal relationship between population per bed, age dependency, life expectancy and mortality rate causes per Capita GDP. The results show the poor allocation of public health expenditure and also show that long term indicators of human capital education and health have an impact on economic growth and there is no short run relationship between health indicators and economic growth. The health indicators education, life expectancy, age dependency and mortality rate are independent variable and economic growth is dependent variable.

Akram and Khan (2007) stated that study shows inequality of resource distribution and unfair provision of health services due to government expenditure. Health is an important factor of the efficiency of labor force which plays a vital role in generation of revenue which leads to economic growth. To increase human capital government subsidizes provision of health facilities to its citizens. The study lays emphasis over standard and measure of living in Pakistan. The methods of Gini coefficient and concentration coefficient are used to check the relationship between preventive measures used by households and the availability of clinics and general hospitals for health facilities and mother child heads. The results show that inequality in resource and expenditure distribution is higher in the provision of preventive facilities, in provision of general hospitals and clinics and the mother to child heads in comparison to the coefficient of concentration which is low in proportion to it. Development of health sector is dependent variable whereas government expenditure which includes the facility of preventive measure, the facility of general clinics and hospitals and the mother to child heads count.

Nishtar (2007) yields information of relevance to health status of people of Pakistan, health system and health information systems of Pakistan. She offers recommendations to strengthen Pakistan's health information system by focusing on institutional arrangements and strengthening data sources and collection mechanisms. The quantitative data on "crude death rate", "crude birth rate", "life expectancy rate", total population of rural and urban area of men and women, mortality rate and morbidity rate, maternal and child health, communicable diseases, non-communicable diseases, injuries, mental illnesses and disabilities and on dependency ration is been collected to make a quantitative analysis. Over the years birth rate have been increasing but suddenly it tends to decrease, the death rate have been constantly increasing due to lack of facilities whereas the life

expectancy rate of an individual have been fluctuating over the time due to increase in diseases to which the individuals are not immune to. The maternal and child health has not been given due attention.

Shezad (2005) stated that there are different ways of financing health programmes to change health outcomes. The health expenditure varies from all developing to developed countries. In low income countries financial protection against the cost of illness is still incomplete. As health services quality and health outcomes are both dependant on income and overall health expenditure. The results showed negative price elasticity estimates for a study for Pakistan where a fall in demand for health care is observed as price rises. When demand is inelastic, increases in health care price raise revenue (the positive effect is larger than the negative demand effect). When price of health care is elastic, increase in price reduces revenue because negative demand effect outweighs positive price effect.

Toor and Butt (2001) stated that investment in human capital in form of expenditure on health increases the productivity. Health expenditure is taken as independent variable which brings changes on the health outcomes. The quantitative data over age of child, the gender of child, schooling of child's mother, household per capita, reported days of child's disease or health problem, immunization of child, any before treatment made on child or the treatment that is been given to child now and the residence of child is been used to find the relationship between the health expenditure and its affects over the health of the individual. The regression model is used to determine the relationship of variables. The results showed that relationship in health inputs and health outcomes are a bit vague as it includes many more variables or factors as well.

Siddiqui et al., (1995) mention that component of human capital is improvement of the health status of the population. The changes in socio-economic conditions of the country would determine the provision of better health facilities. The socio-economic factors include education, Gross National Product Per Capita and urbanization. The relationship between socio-economic factors and the health facilities of the developing countries are calculated. The multi variable regression analysis is conducted to find relationship between GDP Education and urbanization. After testation results showed that with an increase in GDP the doctors per head increases, the availability of nurses per head increases the GDP and education are collinear. The results also showed that GDP is important determinant of non- developmental expenditure of the government. The results also show that the more resources are consumed the more the expenditure on health rises. Variables in the research are GDP; Education and Socio Economic changes are the independent variables that affect the expenditure of government done on the health sector.

III. Theoretical Framework

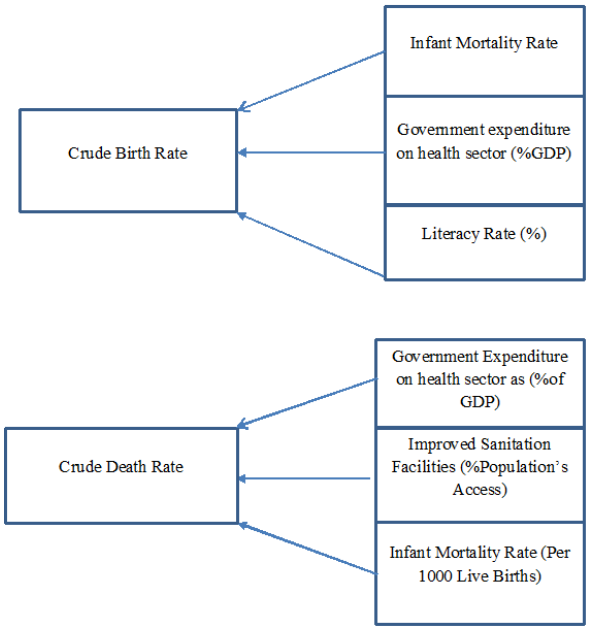


Figure 3.1: Theoretical Framework

III.I. Dependent variable

Health sector is measured through "crude death rate" and "crude birth rate".

- "Crude Death Rate"

Average number of deaths per 1000 over a year is known as crude death rate (World Bank,2016).

- "Crude Birth Rate"

"Average number of births per 1000 over a year is known as crude birth rate" (World Bank,2016).

III.II. Independent Variable

Government expenditure is measured through health expenditure % GDP, infant mortality rate, literacy rate and improved sanitary facilities.

- Health Expenditure Total % GDP

"Total health expenditure is the sum of public and private health expenditure. It consists of provision of health services, family planning activities, nutrition activities, and emergency aid given for health." (World Bank ,2016).

- Literacy rate(% of both Sexes)

"Percentage of population above 10 who can read and write simple description is considered functioning literate" (UNESCO,2016).

- Infant Mortality Rate

"Infant mortality rate is the number of infants dying before reaching age of one year, per 1,000 live births in a given year" (World Bank,2016).

- Improved Sanitation Facilities

"Access to improved sanitation facilities refers to the percentage of the population using improved sanitation facilities. Improved sanitation facilities ensure hygienic ways of dumping the human waste it includes flush, piped sewer system, septic tank, pit latrine, ventilated improved pi latrine, pit latrine with slab, and composting toilet." World Bank(2016).

Y_1 Crude Birth Rate$=\alpha_0+ \beta_1$Literacy Rate$+B_2$ Government Expenditure$+B_3$Infant Mortality Rate $+\mu$-----Eq (i)
Y_2 Crude Death Rate$=\alpha_0+ \beta_4$Infant Mortality Rate $+B_5$ Government Expenditure$+B_6$Improved Sanitation Facilities$+\mu$---------Eq (ii)

III.III. Econometric Model

$Y_1=\alpha_0+ \beta_1x_1+B_2x_2+B_3x_3+\mu$
$Y_2=\alpha_1+B_1x_4+\beta_2x_5+B_3x_6+\mu$
Y_1= Crude Death rate
Y_2= Crude Birth Rate
X_1=Literacy rate
X_2=Government Expenditure (%GDP)
X_3=Infant Mortality Rate
X_4= Improved Sanitation Facilities
X5= Infant Mortality Rate
X6=Government Expenditure (%GDP)

In this paper the stationarity of the variables is tested through Augmented Dickey Fuller test. Stationarity means that despite shocks the variables have tendency to revert back to the mean value. Augmented Dickey fuller test is used to test unit root of each variable either at level without trend and intercept or with intercept and no trend or with both trend and intercept same is tested at first difference.

At level

- With no intercept and no trend:

$\Delta Y_t=\Upsilon Y_{t-1+}\Sigma\beta i\Delta Y_{t-i}+\mu_t$

- With intercept:

$\Delta Y_t=\alpha_0+\Sigma\beta i\Delta Y_{t-i}+\mu_t$

- with intercept a trend:

$\Delta Y_t=\alpha_0+a_{1t}+\Sigma\beta i\Delta Y_{t-i}+\mu_t$

To test long run relationship Auto Regressive Distributive Lagged model is used. At first short run equation is been tested:

$\Delta Y_T=\alpha+\Sigma PY_{t-1}+\Sigma\beta 1\Delta X_{1t-i}+\Sigma\Upsilon\Delta X_{2t-i}+\Sigma\emptyset\Delta X_{3t-i}+\lambda 1Y_{t-1}+\lambda X_{1t-1}+\lambda 3X2_{t-1}+\lambda 4X_{3t-1}+\mu t$---------(iii)
$\Delta Y_{T=}\alpha+\Sigma PY_{t-1}+\Sigma\beta 1\Delta X_{4t-i}+\Sigma\Upsilon\Delta X_{5t-i}+\Sigma\emptyset\Delta X_{6t-i}+\lambda 1Y_{t-1}+\lambda X_{1t-1}+\lambda 3X2_{t-1}+\lambda 4X_{3t-1}+\mu t$--------- (IV)
Where t for independent variables for model (iii) & (IV) is 1 for independent variables and 3 for dependent variables.

Then the long run equation is tested:

$\Delta Y_T=\lambda 0+\Sigma\beta_1\Delta Y_t\text{-}i+\Sigma\beta_2\Delta X_{1t\text{-}i}+\Sigma\beta_3\Delta X_{2t\text{-}i}+\beta_4\Delta X_{3t\text{-}i}+\pi\mu_{t\text{-}i}+\varepsilon_t$ ---------- (1)

$\Delta \log Y_T=\lambda 0+\Sigma\beta_5\Delta Y_t\text{-}i+\Sigma\beta_6\Delta X_{t\text{-}i}+\Sigma\beta_7\Delta X_{5t\text{-}i}+\beta_8\Delta X_{6t\text{-}i}+\pi\mu_{t\text{-}i}+\varepsilon_t$ ---------- (2)

I=No of lags of regressors

$\Pi\mu t\text{-}i_=$ ECM Factor

ε_t=Error Term

IV. Results and Interpretations

If t calculated is less than t critical then we fail to accept H0 either with no constant no trend or with constant and no trend or with both constant and trend.

Table 4.1 Stationarity Results

Variable	Calculated value	Critical value	P-values
Crude Birth rate	-5.08	-3.00	0.0005
Crude Death rate	-2.07	-1.95	0.03
Government Expenditure % of GDP	-4.54	3.58	0.0001
Literacy Rate	-2.15	-1.95	0.03
Infant Mortality Rate	-16.7	-1.95	0.0001
Improved Sanitation Facilities	-5.41	-3.63	0.0013
LOG CBR	-4.32	-3.00	0.0029

Table 4.2 level of Integration

Variable	Level of integration
CBR	1
CDR	0
LR	1
GE	1
IMR	0
CBR 1	0
IS	0

As the order of integration of the first two models (CBR, CDR) dependent and independent variables are different hence it is concluded ARDL test would be run on both models.

Table 4.3 Short run results

Variable Name	Calculated Value
R^2	0.95
Adjusted R^2	0.93

Improved sanitation facilities, infant mortality rate and government expenditure brings about 95% changes in crude death rate.

Table 4.4 Bound Test Results

Calculated Value	Lower bound	Upper bound
6.88	3.38	4.23

The calculated value 6.88 is greater than upper bound 4.23 we reject H0 and there is co-integration.

Table 4.5 Long Run Result

Variable Name	Coefficient	Probability
Improved Sanitation Facilities	-0.46	0.11
Health Expenditure	-1.41	0.15
Infant Mortality Rate	0.26	0.0009

Table 4.6 Heteroscedasticity Test

Variable Name	Calculated value
F probability	0.065

The calculated value 0.065 is greater than critical value 0.05 we accept H0 and there is no heteroscedasticity.

Table 4.7 Autocorrelation results

Variable Name	Calculated Value
F probability	0.61

The calculated value 0.61 is greater than critical value 0.05 hence we accept H0 and there is no autocorrelation.

Dynamic Stability

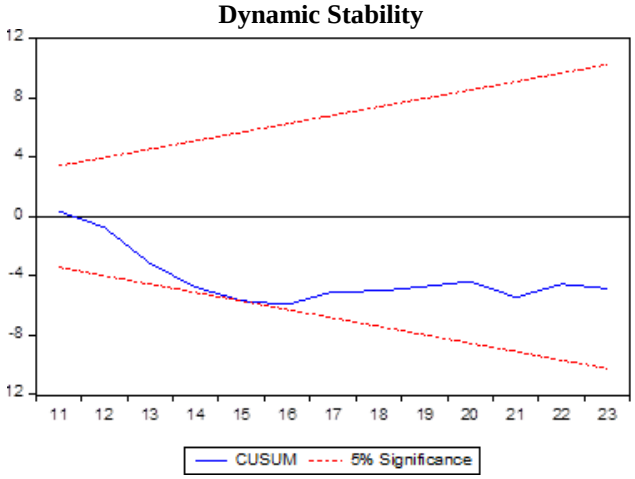


Figure 4.1 CUSUM Test CUSUM square test

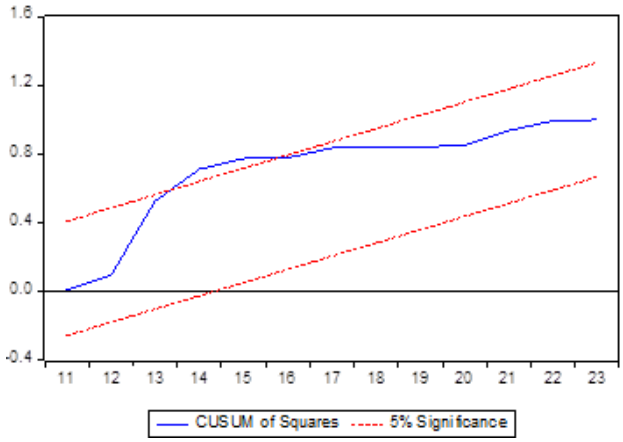


Figure 4.2 CUSUM Square Test

From the ARDL model it can be concluded that the government expenditure has a significant impact over health sector of Pakistan. Policies are pro-health sector enhancement which is also to be implemented socially and politically. This would have positive impact on economic growth. Hence the model after facing shocks due to terrorism attacks and floods can adhere shocks in long run at 5% significance level.

Table 4.8 Bound Test Results

Calculated Value	Lower bound	Upper bound
4.04	2.97	3.74

Hence the calculated value 4.04 is greater than upper bound critical value 4.23 we fail to accept H0 and there is co-integration.

Table 4.9 Long Run results

Variable Name	Coefficient	Probability
Infant Mortality Rate	0.04	0.05
Government Expenditure	0.07	0.62
Literacy Rate	-0.001	0.88

If one more child per thousand dies crude birth rate increases by 0.04 percent on average keeping other things constant. The T-probability shows that it is significant as it is 0.05 which is equal to critical value 0.05. Government Expenditure has an insignificant impact on Crude Birth rate. Literacy rate has an insignificant impact on Crude Birth rate.

Table 4.10 Autocorrelation Results

Variable Name	Calculated Value
F-probability	0.99

As the calculated value 0.99 is greater than 0.05 hence we accept H0 and there is no autocorrelation.

Table 4.11 Heteroscedasticity Results

Variable Name	Calculated Value
F probability	0.32

We accept H0 there is no heteroscedasticity as calculated value 0.32 is greater than critical value 0.05.

Dynamic Stability (According to Appendix M)

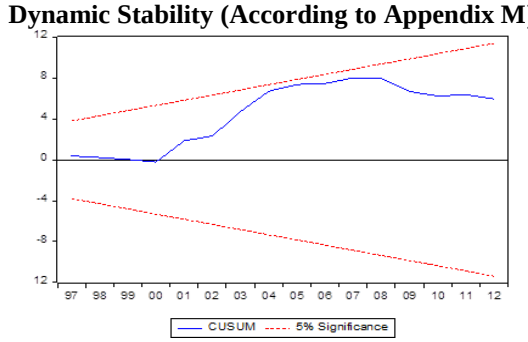


Figure 4.3 CUSUM Test

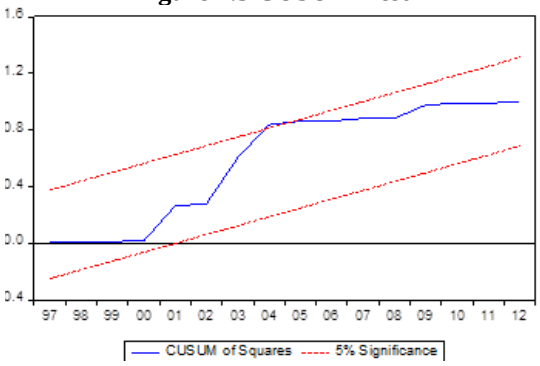


Figure 4.4 CUSUM Square Test

From the ARDL model it can be concluded that the government expenditure has a significant impact over health sector of Pakistan. Policies are pro-health sector enhancement which is also to be implemented socially and politically. This would have positive impact on economic growth. Hence the model can adhere shocks over long period at 5% significance level.

V. Discussion

The results of ARDL test show that there is long run relationship in crude birth rate and government expenditure, literacy rate and infant mortality rate at 10% level of significance where as crude death rate infant mortality rate, improved sanitation facilities and government expenditure at 5% level of significance. But the impact of government expenditure on health sector is insignificant which is expected to be proved as over the year's health sector instead to improve deteriorated. According to estimated results when improved sanitation facilities increases "crude death rate" tends to decrease this is because of provision of better facilities, increase in programs and a better family planning (MNCH, 2006). According to World Health Organization flood causes water borne diseases including cholera, rotavirus and typhoid. Floods also resulted in pregnancy complications. Under these conditions mortality rates (maternal and infant) might increase in the near future as women do not have access to proper health facilities. People living in rural areas do not have access to improved sanitation

facilities because health plans are mostly executed in urban areas which causes an insignificant impact over the decrease in crude death rate whereas the sanitation facilities have been improving (world Bank,2015). According to Economic Survey (2014) the millennium goal of 2015 is to improve the sanitation facilities and reduce crude death rate. People living in urban areas have greater access to better-quality health care than rural households. Government health expenditure is urban bias that gives larger health benefits for richer relative to poorer households (Toor and Butt, 2001). Thus, investing in provision of safe water supply and adequate sanitation is not only a development oriented strategy in itself, it can also yield other socio-economic benefits in terms of improved health status, quality of labour force and reduced burden-of-disease. Water and Sanitation is the neglected sector in Pakistan (PIDE, 2006). If this existing trend continues, 52.8 million people will be deprived of safe drinking water and 43.2 million people will have no access to adequate sanitation facilities in Pakistan. Generally, water pressure is low in Pakistani supply systems. Together with leaky pipes, this has led to infiltration of contaminated water. As a result of sewage and industrial waste, which leaked into drinking water through damaged pipes, major outbreaks of waterborne disease epidemics swept the cities of Faisalabad, Karachi, Lahore and Peshawar in 2006 (Khattak, 2011). Water supply system usually constructed and is expensive and it is difficult to maintain for local communities. Hygiene education and user participation were neglected until 1992, when the federal government launched the Social Action Plan, which was suggested various policy reforms concerning water supply and sanitation (Express Tribune, 2006).

According to estimated results when government expenditure increases crude death rate tends to decrease but has an insignificant impact this is because that federal government allocate the share in budget is transferred to the particular region or province through their representatives who may use the money for the own benefit (Akram & Khan,2007). The insignificant impact is also because the budget allocation from economic survey of Pakistan shows that budget is allocated at a big amount but later is revised and fewer amount is distributed to health sector. The priorities of government change as some focus on health and education whereas some focus on industry and agriculture whereas some have keen interest on developing better relations with other nations and some focus greatly on infrastructure this hinders the development of health sector. Constitution of Pakistan has declared health is primarily responsibility of the provincial government. (Economic survey, 2012).

The results show that when there is increase in infant mortality rate the "crude death rate" tends to increase because of malnutrition, diarrhea, acute respiratory illness other communicable and diseases which cannot be treated are mainly responsible for a high burden of infant mortality, while high maternal mortality is mostly attributed to a high fertility rate, low skilled birth attendance rate, illiteracy, malnutrition and insufficient access to emergency care services. (Economic Survey, 2012). The results show that when government expenditure increases it increases the "crude birth rate". Government expenditure and crude birth rate have long run relationship the crude birth rate which to improve with the improvement in the transmission of the funds allocated by government. Most of empirical studies show that public spending and health care system performance have doubtful relationship. Some studies indicate that the effect of public spending on health status is not significant (Carrin and Politi, 1995) while other studies prove lower or positive effect (Gupta et al., 1999; Gupta et al., 2001; Novignon et al, 2012) With increase in health care financing, provision of health insurance, providing employees with social security would increase crude birth rate these results were supported by Akram & Khan (2007). The impact of government expenditure on crude birth rate is insignificant in case of Pakistan as per testation is because federal government allocates a results low share in budget for health sector and money is transferred particular region or province through the representatives which may use the money for their own benefit (Akram & Khan,2007). The decision making in health sector have been under influence of federal bureaucracy and many financing institutions. Pakistan always suffers in case of financial position of the country and also mismanages human resources. People who use government health facilities are not satisfied because of shortage of medicines, long distances to the facility and due to bad behaviour of staff as supported by (Shaikh, 2013).

According to results when literacy rate increases the "crude birth rate" decreases this is because the fertility declines due to increase in awareness, family planning Programs, access to usage of contraceptives, increase in wage rate, urbanization an increase in status and education of women (Bhutto & Butt, n.d). The increase in use of contraceptives is caused by increase in female literacy, awareness through media and easy access to contraceptive techniques (Economic survey,2014). Basically it was aimed to reduce population because the increase in population depleted the resources spreading hunger and poverty threatening global economic and political stability. (Earth Policy Institute,2011). Impact of literacy rate is insignificant because the system of literacy rate has not been established in its true essence in Pakistan since its establishment nor the proper allocation of budget is made for the nourishment of education. The gender inequality in rural areas causes the women to work home give birth to children and men are ought to wok this is due to illiteracy this difference in rural and urban areas causes an insignificant effect over the control of crude birth rate (Chaudhry,2009).

As per the results above when infant mortality rate increases crude birth rate increases the reason behind it is that in rural areas people want more children so that in future they can become the helping hand of family to meet the rising income inequality. A high infant mortality rate usually indicates insufficient nutrition, malnutrition, and a high incidence of infectious disease (usually from contaminated drinking water). Infant mortality rate is at a high rate because of inadequate health care of poor women during pregnancy and of their babies after birth, drug addiction among pregnant women, and the high birth rate among teenagers. Low birth weights are also one of reasons of increase in infant deaths. Malthus stated that in the race between increasing population and increasing production, population must eventually win. Both Malthus and Ricardo explained that income can be improved with an increase in fertility rate (Siddiqui,1996). Mostly poor parents plan a new baby to replace their lost child or sometimes they want a baby to become their support in future (Siddiqui ,1996). Birth rate increased because of increase in fertility rate, control of fatal diseases, illiteracy, and increase in infant death rate, early marriages, and low status of women, joint family system, warm climate and false religious practices (Economic survey ,2014). The death rate is an inverse function of the average lifespan. People can afford more food, protection, and medicine with wealth, increasing their lifespan and decreasing the death rate. Mostly pregnancies in Pakistan are unplanned; many people continue having children without giving thought to the conditions of raising another child that can become a supporting hand in their future. Even couples who want to have fewer children lack access to family planning advice. This causes unplanned pregnancies, many of which end in unsafe abortions and maternal deaths. For women abortion seems to be a family planning method rather than using effective contraception. Increased contraceptive use could reduce the number of unsafely performed abortions and resultant deaths (Ali,2013). The fertility rate of educated and uneducated women in a society differs. Better educated may be influenced by the educational distribution in the community. If aggregate education on the whole, reduces fertility significantly will lead a welfare society. Increase in women's education the difference in standard of education and quality of education also show a difference in the results of a step taken for improvement (Toor,2007).

VI. Conclusions

This study examines the impact of government expenditure on health over labor productivity. Stationarity test and auto regressive lag distributive method are used to analyse the impact of government expenditure on health sector of Pakistan. The empirical and theoretical results of the study indicate that Impact of health expenditure on health sector of Pakistan is highly insignificant at 5% percent level of significance. The results show that the budget allocation is in huge amount but utilization is not appropriate due to dishonesty and corruption. The relationship of government expenditure and CBR is positive and is insignificant which is justified as per the expectation with the scenario of Pakistan's economy that the funds are not allocated or distributed to the local bodies; whereas infant mortality rate has positive relationship with CBR and is also significant which shows that especially rural population due to the sayings of Islamic scholars and illiteracy the birth rate tends to increase whether the infant mortality rate increases and literacy rate has a negative relationship with CBR and is insignificant because education level is not yet properly defined in Pakistan nor the facilities have improved whereas the crude birth rate reduces because of increase in women empowerment and the family planning programs and enough consciousness have led the women to think before planning a family. The relationship of improved sanitation facilities and CDR is positive because of the improvement in the access to clean water reduces death rate but is insignificant because of lack of transparent provision of such facilities. A proper planning and implementation is required to improve this sector because productivity, GDP, Trade, education mostly rely on health. CDR and infant mortality rate have positive relationship and is significant and government expenditure has a positive relationship with CDR but it is insignificant because of lack of transparent provision of funds.

VI.I Recommendations

- The allocation of funds for health sector should be transparent. Each regional government should get funds as per the population in the region. This would make the efficient allocation of resources and better facilities could be provided.
- The funds allocated in budget should be transmitted in same amount as mentioned in budget.
- More hospitals should be established so that the beds do not fall less at time of emergency.
- Literacy rate should be increased and policies should be made to promote the awareness campaigns as per the millennium goal of the plans of ministry of Finance.
- Better sanitation facilities should be provided so that the disease rate reduces this would also reduce the crude death rate by providing a healthy life to individuals.
- If the nation wants to improve it should improve its health sector as more expenditure on health more would be employment and more would be production which would at last increase GDP per Capita.

- Proper awareness of importance of health of a mother should be spread through campaigns or media so that the health of women remains stay better during pregnancy and this would reduce infant mortality rate.

Appendixes Can Be Provided upon request directly from Author.

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