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An Association between Health and Economic Growth in India

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Abstract:

The broad objective of this study is to understand the effect of economic growth on health; to find the impact of per capita net state domestic product (PCNSDP) on health indicators via infant mortality rate (IMR), under five mortality rate (UFMR) and immunization (IMM). This study is in four periods (1992-93, 1998-99, 2005-06 and 2010-11) and 25 states of India. The data has been used from different sources. In this study it is observed that GDP has increased since 1992-93 and in the period 1997-98 to 2005-06 there was a high rate of increase in it. Immunization has not increased fast in all the periods, also IMR and UFMR have decreased slowly over time. The results by the elasticity show that the effect of female literacy on health (via IMR, UFMR and Immunization) is much important than income. There must be many other relevant factors that influence on health. It can be concluded that the role of female literacy is without doubt more important on the health system than economic growth. However, to have more sustained health quality, we need to focus on the broader aspects of development and not just economic growth. The study shows that literacy and educational attainments play a significant role in improving the health in different states in India therefore, they should be improved; especially among the states which are educationally backward and awareness about health and well-being living is very low. Some factors like income and health inequalities are needed to explore more in the states to identify the best strategies and practices to promote economic development, poverty reduction and a healthy society in India.

Keywords: Economic Growth, IMR, UFMR, IMM, Female literacy

1. Introduction

Health status is affected by many socio-economic factors. In the literature of health economics, the most important factors that have been considered important for affecting health care are income, education and poverty as economic factors; and early marriages, religion, caste, gender, etc. as cultural and social factors. People with a more favourable socio-economic position have better health compared with those who are less well off. For instance, female literacy is considered as an important determinant of health as it creates information access, improved nutrition and medical care.

The greatest challenge of the twenty-first century is to provide every human being with a long and healthy life, free from poverty and full of opportunities in his community. The Millennium Development Goals (MDGs)- signed by 189 countries in 2000 - set clear targets for reducing poverty and other causes of human deprivation and for promoting sustainable development. How far are we from meeting these goals? How is the progress towards achieving good health? And what are the resources needed to help a country improve health status and development in both short and long terms?

National Rural Health Mission was launched in India in 2005 with the goal of providing universal access to equitable, affordable and quality health care which is accountable at the same time responsive to the needs of the people, reduction of child and maternal deaths, population stabilization, as well as gender and demographic balance.

1.1. Income and Education in India

Income: India's per capita gross national income has grown since 2002. It has about tripled from \$2170 in 2002-03 to \$5,640 in 2013-14, i.e., average growth of 14 per cent during twelve years. As of 2010, according to World Bank statistics, about 400 million people in India, as compared with 1.29 billion people worldwide, live on less than \$1.25 (PPP) per day. These consumption levels are on an individual and not household basis.

Education: India has made notable progress in terms of primary education attendance rate and expansion of literacy to approximately three-fourths of the population. Her literacy rate has grown from 52.2 per cent in 1991 to 74.04 per cent in 2011. However, the literacy rate of 74 per cent is still lower than the worldwide average of 84 per cent and the country suffers from a high dropout rate. Further, there exist great disparities in literacy rates and educational opportunities between males and females, urban and rural areas, and among different social groups.

2. Review of Literature

By analysing data for long time periods, studies have shown important gains ranging from lower levels to higher levels of health status for developed economies. They show that good health raises both output and economic growth rates. Wheeler (1980) finds that improved health significantly increases labour productivity and income. Behrman (1990) and Fogel (1994) mention that good health raises living standards directly and promotes higher income. Currais and Rivera (1999) analyse the positive role of health attainment in human capital accumulation. Therefore, their main conclusion is that health has a positive and statistically significant effect on economic growth. So, healthier nations would be wealthier nations. According to Malik Garima (2006), more attention has been given to education levels than to health status.

Income works to health through the effect of the private purchase of the inputs to good health, e.g., nutrition, medicines and healthcare (Schultz 1999; Viscusi 1994). Health status serves both as an indicator of population welfare and, in some of the studies, as a determinant of economic growth rates. Fogel (1994) shows that about one-third of the increase in income in Britain during the nineteenth and twentieth centuries could be attributed to improvements in health and nutrition. According to a World Bank study by Wang et al., (1999) income growth is less important for improving outcomes than other factors such as access to health technology (data from 1952 to 1992). Preston (1975), by using cross-country evidence, suggests that the effect of improvements in income on health was greater for the poorest countries than for the richest countries. He (1976) analysed cross-country data on life expectancy and national incomes for periods 1900, 1930 and 1960, and observed that the curves showed an upward shift over time.

The review of literature shows that socio-economic status (SES) and health are strongly related in both developing and industrialized countries, as well as in welfare states and liberal democracies. Some dimensions of SES cause health, others are caused by health, and still others are mutually determined with health. These differential patterns of causality make a single theory of socio-economic gradients in health difficult to propound. In childhood parental resources - education and income, for example - have a potent effect on health. Parental behaviours, which themselves are influenced by SES, play some role in the determination of child health (Case and Paxson 2002).

It is important that health policy-makers consider how to improve the quality of data emanating from the public health surveillance systems. This would ensure that health investments are properly channelized with the potential to reduce inequalities and ensure longer term improvements in health (Health and economic development in south-eastern Europe, WHO, 2006). Faisal and Waheed (2011) estimated the relationship between human capital and economic growth in Pakistan by using the Cobb-Douglas production function. Their study confirms the long run positive relationship between human capital and economic growth. The health adjusted education indicator for human capital was found to be a highly significant determinant of economic growth.

3. Data and Methodology

In this study the data has been used from different sources like National Family Health Survey (NFHS 1, 2 and 3), Sample Registration Survey (SRS), Coverage Evaluation Survey (CES), Census of India and Reserve Bank of India for the four periods of 1992-93, 1998-99, 2005-06 and 2010-11. The data on PCNSDP has been obtained from *Handbook of Statistics on the Indian Economy* published by the Reserve Bank of India. Since the data were available on different base periods, they have been transformed to 2004-05 bases. The data on female literacy rate are based on the Census of India. Further, the data for IMR, UFMR and immunization are taken from the NFHS Reports for 1992-93, 1998-99 and 2005-06. The data for IMR and UFMR for 2010-11 are taken from Sample Registration Survey. Immunization data are taken for 2009 from Coverage Evaluation Survey, 2009. The Pattern of Economic Growth and Health, overtime in India by figures and the elasticity of health with respect to PCNSDP and female literacy has been done.

4. Objective of the Analysis

The main objective of this study is to study the impact of the PCNSDP and female literacy rate on health indicators via IMR, UFMR and immunization, if any. Broadly, it seeks to find out if economic growth can improve the health quality or is it too narrow to define a variable for health status? Also, if economic growth helps in boosting the health quality, how far can we depend on it and how important is economic growth as a determinant of health?

Is growth a necessary as well as sufficient condition to improve health? Or, do we need to look at the broader idea of growth, that is, development factors like female literacy to improve the quality of life? In other words, an attempt is made to answer the following questions:

- i. What is the impact of economic growth and female literacy rate on IMR, UFMR and immunization?
- ii. Is the impact of economic growth on health greater, equal or less than the impact of female literacy rate on health indicators?

There are many studies that show that economic growth and health are related with each other. However, the literature is much focused on how health determines economic growth. The present analysis tries to understand the effect of growth on health and the extent to which it enhances health quality.

4.1. Health Status in the States of India

Health status is affected by many socio-economic factors. In the literature of health economics, the most important factors that have been considered important for affecting health care are income, poverty and education as economic factors; and early marriages, religion, caste, gender, etc. as cultural and social factors. These factors are major determinants of health and well-being because people with a more favourable socio-economic position have better health compared with those who are less well off. These determinants, therefore, strongly interact to influence health and, in general, an improvement in any of them can produce an

improvement in both health behaviour and outcomes among individuals or groups. For instance, female literacy is considered as an important determinant of health as it creates information access, all the prenatal and post natal care, improved nutrition and medical care.

4.1.1. Under Five Mortality Rate¹

UFMR is considered as an important indicator of health because it is regarded as dependent on broad socio-economic factors such as female education, access to preventive and curative health services, immunization coverage, safe drinking water, nutrition intake and sanitation.

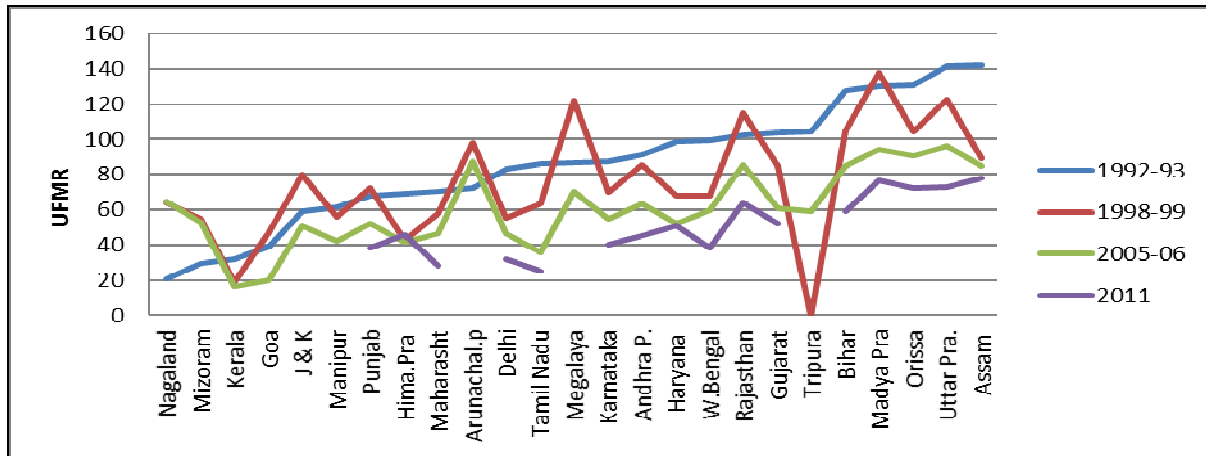


Figure 1: Trend in Under Five Mortality Rate

Figure 1 shows the trends of UFMR in four periods of time in different states. There is much of the heterogeneity among the states and the regions over time. There has been a consistently lower UFMR in Kerala and it has seen a continuous fall. However, in the states like Tripura, the fall is not continuous. It rose again in 2005-06 after a steep fall in 1998-99. Further are other trends in remaining states. The states like Punjab, Rajasthan, Madhya Pradesh and Uttar Pradesh have a much sharper decline in it from 1992-93 to 2011. However, in states like Kerala the change in it is relatively small, but the absolute figures also show less UFMR since 1992-93. ²This means its trends are more uniformly distributed over time.

4.1.2. Infant Mortality Rate²

IMR is regarded as a highly sensitive measure of population health. It reflects the association between the causes of infant mortality and other factors that are likely to influence the health status of whole population such as the economic development, general living conditions, social well-being, rates of illness and the quality of environment.

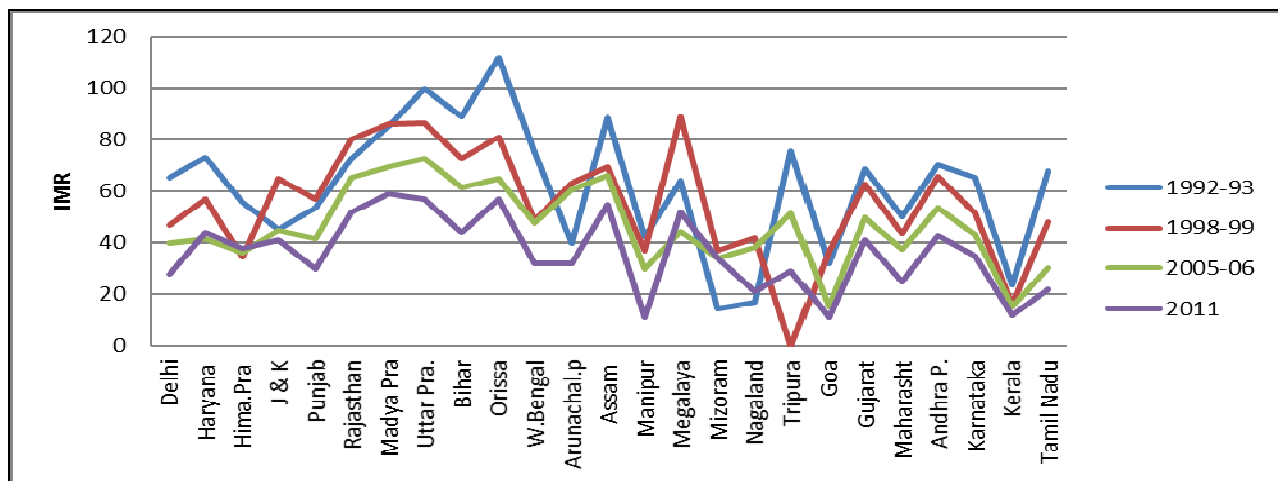


Figure 2: Trends in Infant Mortality Rate

¹ The rate defined as the annual number of children dying between birth and exactly five years of age and is expressed per 1000 live births

² IMR is defined as the number of deaths in children of less than one year of age per 1000 live births in the same year.

Figure 2 shows the trends of IMR over time in different states for four periods of time. The trends are more or less similar to that of UFRM as shown in Figure 1. The relatively less developed states like Uttar Pradesh and Orissa have higher IMR in all the time periods even after much decline. On the other hand, more developed states like Kerala and Goa have consistently lower IMR in all four years as compared with other states. The highest IMR in 2011 is observed in Madhya Pradesh (59) and the lowest IMR in Goa and Manipur (11).

Immunization: Finally, we talk about immunization which is widely regarded as a good proxy for the overall strength of a government's public health system. It is designed to measure the extent to which governments are investing in the health and well-being of their citizens. Moreover, it affects the economic growth as the healthy workers are more economically productive; healthy children are more likely to reach higher levels of educational attainment; and healthy parents are better able to invest in the health and education of their children. Immunization programmes increase labour productivity among the poor, reduce spending to cope with illnesses, and lower mortality and morbidity among the main income-earners in poor families.

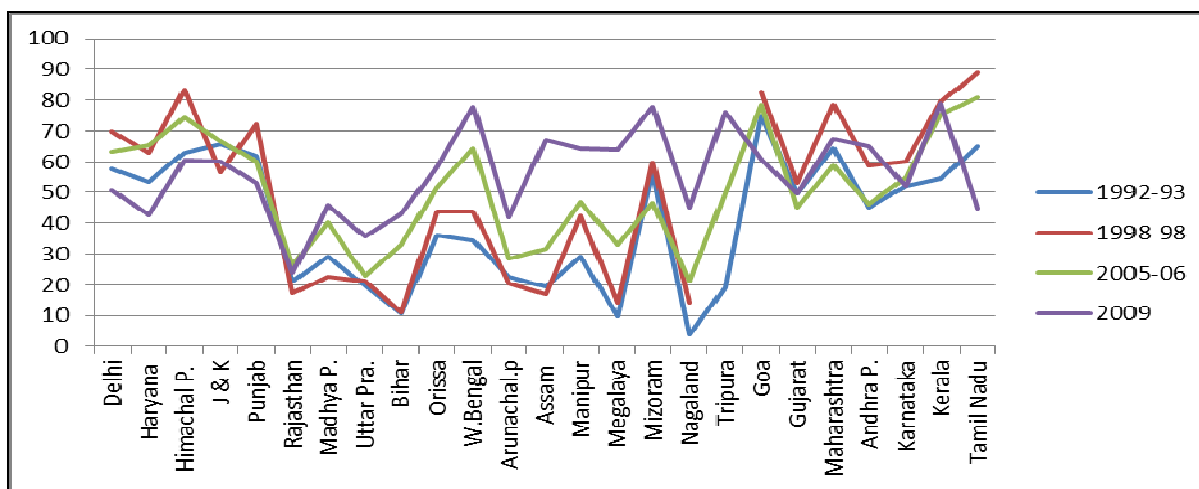


Figure 3: Trends in Full Immunization Rate

As shown in Figure 3, the percentage of full immunization has a heterogeneous distribution among all states. For instance, the states like Delhi, Haryana, Karnataka, Kerala and Tamil Nadu have comparatively higher immunization than Rajasthan, Madhya Pradesh, Uttar Pradesh, Bihar, Nagaland and Meghalaya. Over time, the percentage of immunization has improved. However, in a few states like Delhi, Haryana and Himachal Pradesh, it has fallen in 2009. Thus, the nature of distribution is highly skewed. The highest percentage of immunization in 2009 was in Mizoram (77.9) which increased by approximately 67 per cent since 2005-06. However, the highest percentage of immunization in 2005-06 was in Goa (78.6) which declined to 60.6 per cent by 2009. Therefore, there are high variations among the states.

4.2. Economic Growth and Female Literacy

This study essentially focuses on the two major determinants of health: (a) Per Capita Net State Domestic Product (PCNSDP) as a proxy for economic growth and (b) female literacy which is also considered as one of the variables for economic development. The primary focus is to understand the effect of economic growth on health status in India. However, many of the arguments are based on the effect of health on economic growth. Therefore, the present study attempts to understand this association and to know whether economic growth has any influence on health. If so, then how strong is it as a determinant of health? Can we say that a country with good economic growth can improve its health status significantly? Or, is it that if economic growth influences health, then after a certain achievement, its impact increases only with decreasing rate? Then, do we need to move to a much broader definition of growth by focusing on development indicators like female literacy that can improve the health status?

4.2.1. Economic Growth and Health

Much of the literature of association between health and economic growth is about the causality of health on economic growth. This is mainly based on the labour productivity. Health and education improve the labour productivity. In addition, there are assertions that with higher life expectancy (an indicator of health), individuals save more which adds to capital accumulation and, therefore, GDP. On the other hand, some macroeconomic studies of health and income considers the question whether health determined by economic growth. This is based on the argument that if there is growth in the economy, investment in health increases that improves health services and their reach to the people. Besides, growth boosts investment in other sectors like education that strengthen the socio-economic factors that promote health.

Figure 4 shows the trends of health indicators and economic growth at four points of time. It is observed that GDP has increased since 1992-93 and the rate of increase is much faster after 1997. Immunization has not increased fast in all the periods, also IMR and UFRM have decreased slowly over time. The percentage of immunization has increased over time uniformly. Similarly, there is a continuous and smooth fall in IMR and UFRM at four points of time.

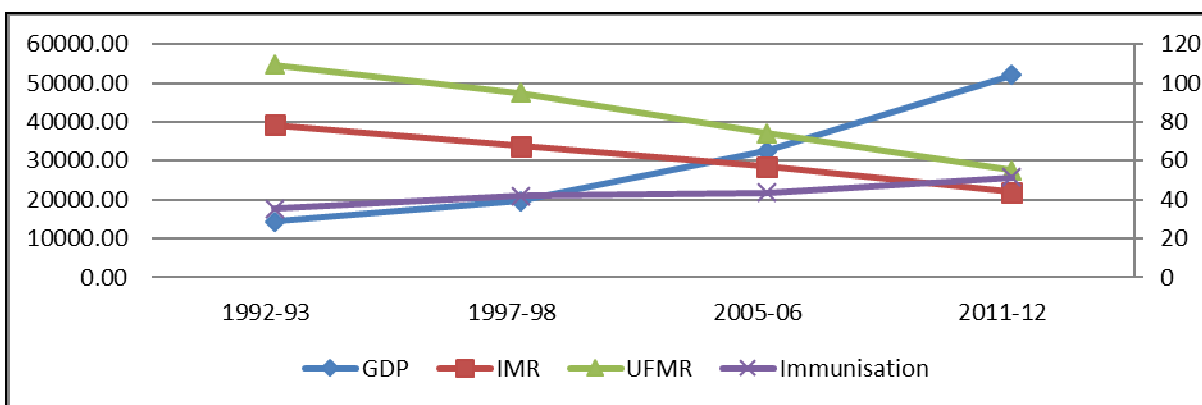


Figure 4: Pattern of Economic Growth and Health Overtime in India

Figure 5 depicts the pattern of change in GDP and change in the values of health indicators over time. The GDP has a steeper slope from 1997-98 to 2005-06. In this period, the slope of change in health indicators, especially IMR and UFMR, is relatively much flatter. This reflects that when there was a high rate of increase in GDP, the change rate of health indicators was less, meaning thereby that there must be many other relevant factors that influence health. This is not to say that economic growth is not an important factor of health. It just means that economic growth is one of those important factors that affect health.

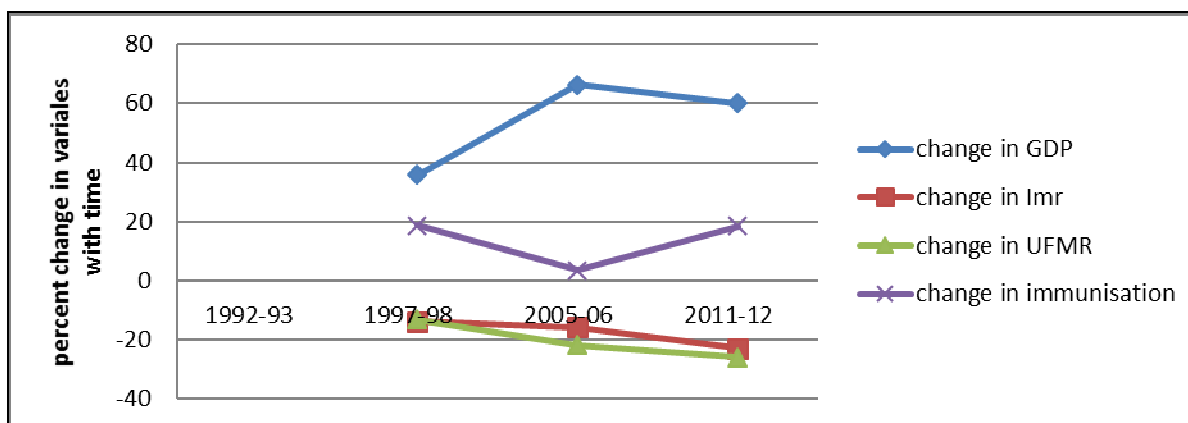


Figure 5: Percentage Change in Economic and Health Variables Overtime

Various studies by authors like Bhalotra (2001) and Hanmer (2000) explain economic growth as an important indicator of health. Economic growth boosts more expenditure on health services that may improve health status. Thus, it is a relevant determinant.

4.2.2. Female Literacy and Health

It is being argued by health economists that female literacy is one of the most important determinants of health as it brings a more sustained impact in the wellbeing of the people. Literate females are aware about the nutritional requirements, good health care, immunization benefits, and pre and post natal care, etc. So, female literacy is considered as an important factor for improving health. Also, females are likely to be aware of the vaccinations needed for their children which reduce the chances of many diseases and, therefore, the IMR and UFMR. Sen (1998) provides the example of Kerala whose success is related to its high level of basic education. Literacy among young adult women in Kerala is close to 100 per cent which is the reason for a less gender bias which reflects less discrimination among girls and, therefore, lowers infant mortality indirectly. Furthermore, lack of education also adversely affects women's health because of likelihood of less knowledge about nutrition, birth spacing and contraception which increases the chances of maternal deaths.

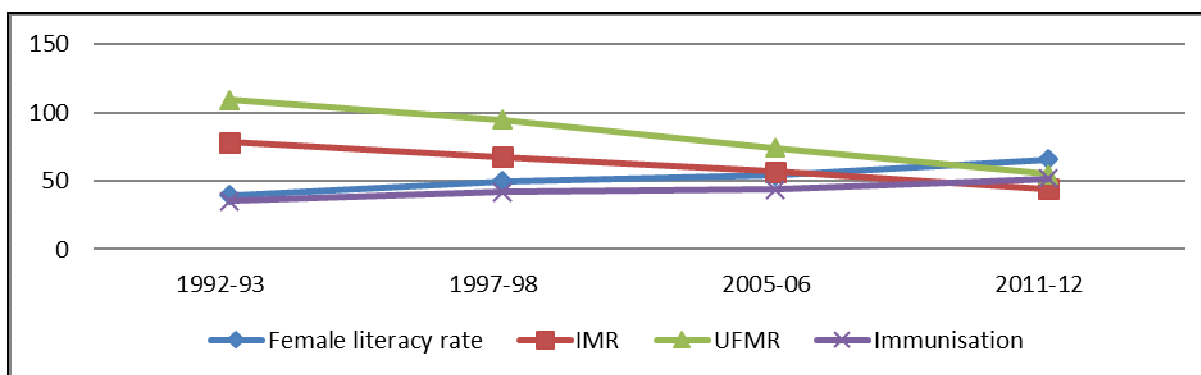


Figure 6: Patterns of Female Literacy Rate and Health Indicators in India

In Figure 6, the pattern of female literacy and health indicators is shown. Immunization has increased in all the periods but not fast. Similarly, there is a continuous and smooth fall in IMR and UFMR at four points of time. Female literacy has improved slowly which after 2005 the rate has become faster.

The percentage of immunization has increased over time uniformly. Moreover, the slope of female literacy curve is much flatter whereas the slopes of IMR and UFMR curves are steeper. This is observed in Figure 7 where the percentage change in the variables over time is shown. Slopes of all the indicators are relatively steeper. This means that there is a possibility that the impact of female literacy rate on health indicators is stronger than that of PCNSDP.

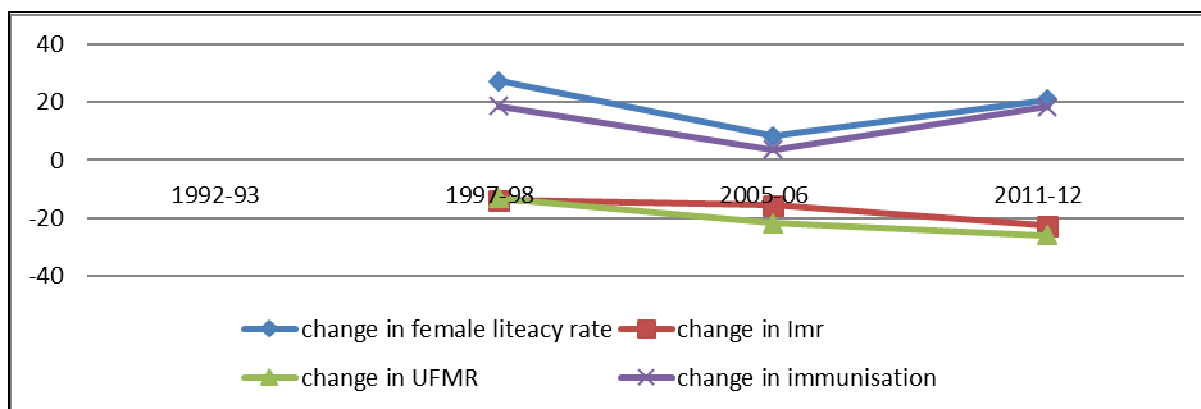


Figure 7: Percentage Change in Health Variables Overtime

Thus, this leads us to look into the role of economic growth on health more vividly. If we rely on economic growth, then to what extent can it be considered to be a boosting determinant of health? Is it that we need some policies to work on broader aspects like that of taking female literacy rate as one of the key determinant of health and frame policies that work on these aspects to improve the quality of life? Thus, we attempt to understand the role of economic growth and female literacy to reach answers of these questions.

4.3. Elasticity of Health

If we look at the elasticity of health with respect to PCNSDP and female literacy, the Table shows that the elasticity of any of health indicators with respect to economic growth is less than the elasticity of any of health indicators with respect to female literacy rate.

The elasticity of IMR and UFMR with respect to female literacy rate is much significant than respect to PCNSDP. For example, elasticity of IMR with respect to female literacy rate is -1.0386 while the elasticity of IMR with respect to PCNSDP is -0.0006 at 2011-2012. The effect of income on UFMR has increased more at 2011-2012 compared to 1998-1999.

Elasticity of Health						
Year	Elasticity of health with respect to PCNSDP			Elasticity of health with respect to Female Literacy Rate		
	Elasticity of IMR	Elasticity of UFMR	Elasticity of IMM	Elasticity of IMR	Elasticity of UFMR	Elasticity of IMM
1998-99	-0.0021	-0.9488	0.5199	-0.2549	-2.7818	0.9009
2005-06	-0.0008	-1.3843	0.0539	-1.3939	-1.8980	0.8400
2011-12	-0.0006	-1.1389	0.3068	-1.0386	-1.3718	0.8031

Elasticity of Health with respect to PCNSDP and Female Literacy Rate

Source: Based on the author's calculation

This shows that health is significantly affected by both the factors and female literacy is much important to increase immunization and decrease IMR and UFMR than income. Therefore, it can be concluded that the role of education is without doubt more important on the health system than economic growth. It is true that income levels are important to enable the people to avail of the health services. However, to have more sustained health quality, we need to focus on the broader aspects of development and not just economic growth.

5. Summary and Policy Implications

There are many studies show that economic growth and health are related with each other, and good health raises both output and economic growth rates. The data of this study is used for the four periods of 1992-93, 1998-99, 2005-06 and 2011-12. It is shown that the rate of economic growth in India has increased since 1992-93 and the rate of increase is much faster after 1997. Health in terms of IMR, UFMR and Immunization has improved. It is found that immunization has not increased fast in all the periods and all the states. Besides, the rates of decrease in IMR and UFMR are slow over time.

Various socio-economic factors play an important role for improvement of health. The association between health and economic growth indicates that there is a close connection between them. The impact of economic growth on health becomes relatively less after attaining a certain level of growth. This suggests that there are the other factors that improve the health status at the higher level.

The study shows that female literacy has much more impact on IMR, UFMR and IMM than PCNSDP. Income levels are certainly important for improving the health status in the economy, but higher income alone does not reflect the complete picture. Therefore, it can be concluded that the role of education is without doubt more important on health; and a combination of high female literacy and increasing in income can bring out the better results for India.

It is important to realize that the health status in India has substantially improved in the last decade. However, it is yet too far away from the targets of Millennium Development Goals (MDGs). India was not able to bring a more rapid decline in IMR and also to promoting the other health indicators.

The study shows that awareness and educational attainments play a significant role in improving the health. Therefore, they need to be improved, especially among the states which are educationally backward. The results show that many public health facilities are ill-equipped and health services are inadequate and/or inefficient in many poor-performing states. The study also suggests that the training programmes in the health sector is needed greater attention in addition to structural factors like governance for further reduction in IMR, UFMR, TFR, and improvement in childhood immunization at all states of India.

The important functions of health systems are directed towards improving the health facilities and their reach to the people. In India there is an additional need to provide equitable, efficient and good quality health systems. This is required to improve the health of people as observed by indicators like infant mortality rate (IMR), immunization, under five mortality rate (UFMR), and also maternal mortality rate, life expectancy and so on. The IMR is still one of the most important indicators of the progress of development.

6. References

- i. Abel-Smith, B., (1994). *An Introduction to Health: Policy, Planning and Financing*. New York. Longman Publishing. pp: 3-30.
- ii. Aguayo-Rico A., Guerra I., & Montes R. (2005). *Empirical Evidence of the Impact of Health on Economic Growth, Political Economy*, Vol. 14, August.
- iii. Ahluwalia, MS. (2001). *State level performance under economic reforms in India*. Working Paper No. 96. Stanford University, USA: Center for Research on Economic Development and Policy Reform.
- iv. Anell A., Willis M. (2000). *International comparisons of health care systems using resource profiles*. *Bulletin of the World Health Organization*, 78:770-778.
- v. Akram N, Haq Padda I. & Khan M. (2008). *The long Run Impact of Health on Economic Growth in Pakistan*, *The Pakistan Development Review* 47: 4 Part II, pp.487-500.
- vi. Alsan M., Bloom D., & Canning D. (2006). *The Effect of Population Health on Foreign direct Investment. Inflows to Low- and Middle- income countries*, *World Development* Vol.34, No. 4, pp 613-630.
- vii. Arora S., (2001). *Health, Human Productivity, & Long-Term Economic Growth*, *The Journal of Economic History* Volum 61, No. 3 (Sep.), pp. 699-749. Published by: Cambridge University Press. Stable URL: <http://www.jstor.org/stable/2698133>.
- viii. Baird M., & Shetty S. (2004). *Getting There, How to accelerate progress toward the Millennium Development Goals*. Health and Development. Editor Jeremy Clift. Washington DC. International Monetary Fund. December. Pp.1-7.
- ix. Bajpai N., & Goyal S. (2004). *Primary Health Care in India: Coverage and Quality Issues*, CGSD Working Paper No. 15, June. The Earth Institute at Columbia University. www.earth.columbia.edu.
- x. Barro, RJ. (1998). *Determinants of Economic Growth: A cross-country Empirical Study*. *Journal of Comparative Economics*, 26. pp 822-824, Article No.JE981532, Cambridge.
- xi. Barro, RJ. (2003). *Determinants of Economic Growth in a panel of countries*. *Annals of Economics and Finance*, 4, pp 231-.274.
- xii. Barro, RJ., & Robert J. (1996). *'Health, Human Capital and Economic Growth'*. Program on Public Policy and Health, Division of Health and Human Development, Paper prepared for the American Health Organization, November.
- xiii. Basu, K., Maertens A. (2007). *The pattern and causes of Economic Growth in India*. *Oxford Review of Economic Policy*, Volume 23, Number 2, pp.143 – 167.
- xiv. Bhargava, A., Jamison D., Lawrence L. & Murray C. (2001). *Modeling the Effects of Health on Economic Growth*, GPE Discussion Paper Series: No. 33, Evidence and Information for Policy, World Health Organization and Geneva.
- xv. Bloom D., & Canning (2005). *Health and Economic Growth: Reconciling the Micro and Macro Evidence*. Working Paper (February), Stanford University, Palo Alto, CA.

- xvi. Bloom D., & Canning D. (2008). Population Health and Economic Growth. Commission on Growth and Development. Working Paper No. 24. The World Bank, USA.
- xvii. Bloom D., Canning D., & Sevilla J. (2004). The Effect of Health on Economic Growth: A Production Function Approach, World Development Vol.32, No 1, pp.1-13.
- xviii. Bloom, D., Canning D., & Sevilla, J. (2001). The Effect of Health on Economic Growth: Theory and Evidence. Working Paper 8587, National Bureau of Economic Research 1050, Cambridge, November. <http://www.nber.org/papers/w8587>
- xix. Brundtland, & Harlem G. (2002). Health and the International Economy. Report of Working Group 4 of the Commission on Macroeconomics and Health, August.
- xx. Case, A. (2001b). Health, income and economic development. Annual World Bank Conference on Development Economics. Available at <http://www.wws.princeton.edu/~chw>.
- xxi. Cutler D., & Miller G. (2004). The Role of Public Health Improvements in Health Advances: The 20th Century United States, Working Paper 10511, JEL No. H4, I1. Cambridge. <http://www.nber.org/papers/w10511>
- xxii. Deaton, A. (2001). Health, inequality, and economic development. CMH Working Paper No. WGI: 3, Commission on Macroeconomics and Health.
- xxiii. Dreze, J., & Sen A. (1995). India: Economic development and social opportunity. Delhi: Oxford University Press.
- xxiv. Elmi, Z., & Sadeghi S. (2012). Health Care Expenditures and Economic Growth in Developing countries: Panel Co-Integration and Causality. Middle-East Journal of Scientific Research 12 (1): 88-91.
- xxv. Garmia, M.(2006). An examination of relationship between health and economic growth. Indian council for the research on international economic relations, Working paper No. 185.
- xxvi. Grossman, M. (1972). On the Concept of Health Capital and the Demand for Health. *Journal of Political Economy*, 80: 223-255.
- xxvii. Gujarati, DN. (2004) 4th ed., Basic Econometrics, New York: The McGraw-Hill. Gupta I., Mayur T. (2008). The slow decline in the infant mortality rate in India. *Journal of Health and Development*, Vol. 4 No.1-4
- xxviii. Gupta I., & Mitra A. (2004). Economic Growth, Health and Poverty: An Exploratory Study for India. *Development Policy Review*, 22 (2), March.
- xxix. Hammer, J. (1997). Economic Analysis for Health Projects. *World Bank Research Observer* 12(1):47-71.
- xxx. Hausman, JA., & Taylor, WE. (1981). Panel data and unobservable individual effects. *Econometrica*, 49:1377-1398.
- xxxi. Kapoor, Sh. (2010). Infant Mortality Rates in India: District Level Variations and Correlations. UC Riverside. May 22. http://www.isid.ac.in/~pu/conference/dec_10_conf/Papers/ShrutiKapoor.pdf
- xxxii. Krishnan, TN. (1995). Access to health and burden of treatment in India: An inter-state comparison. Working paper No. 2, UNDP Research Project. Thiruvananthapuram: Centre for Development Studies; 1995.
- xxxiii. Leipziger, D., Fay M., Wodon Q. & T. Yepes (2003). Achieving the Millennium Development Goals: The Role of Infrastructure. Policy Research Working Paper No. 3163, World Bank, Washington, DC.
- xxxiv. Lleras-Muney, A. (2001). The relationship between education and adult mortality in the U.S. Columbia University, Mimeo.
- xxxv. Lustig, N., & Gertler P. (2001). Health, shocks and poverty. Notes prepared for the Commission on Macroeconomics and Health (CMH). Draft. 8 June.
- xxxvi. Milis, A. (2011). Health System in Low- and middle- Income Countries. Glied Sh., Smith P.(eds): *The Oxford Handbook of Health Economics*. Oxford University Press. New York. pp.31-57.
- xxxvii. Mushkin, S.J.(1962). Health as an Investment. *Journal of Political Economy*. 70(5): 129-157.
- xxxviii. Sachs, JD. (2004). "Health in the Developing World: Achieving the Millennium Development Goals." *Bulletin of the World Health Organization* 82(12):947-49.
- xxxix. Sadr, S.M.H. (2012). A Review of the Impact of E- health on Economic Growth in developed and developing countries. *Developing Country Studies* www.iiste.org. ISSN 2224-607X (Paper) ISSN-0565 (Online), Vol 2, No.7.
- xl. Savdeoff, W.D., (2004). "Find Out What Works to Achieve the MDGs." *Bulletin of the World Health Organization* 82(12):950-1.UNDP, 2003.
- xli. Tandon, A. (2005). Attaining Millennium Development Goals in Health: Isn't Economic Growth Enough? Red Policy Brief, Sereise No.35 (Asian Development Bank).
- xlii. Vogelpang, B. (2005). *Econometrics, Theory and Applications with EViews*. England, Pearson Education Limited.
- xliii. Wagstaff, A. (2001). Poverty and health. Commission on Macroeconomics and Health Working Paper Series WGI: 5, Geneva: WHO.
- xliv. Weil, D. N. (2007). Accounting for the Effect of Health on Economic Growth. *The Quarterly Journal of Economics*, Volume 122, Issue 3 August, Page: 1265-1306.
- xlv. World Bank (2004). Attaining the Millennium Development Goals in India: Role of public policy and service delivery, Human Development Unit, South Asia Region The World Bank.
- xlvi. World Bank (2007). *World Development Indicators 2007*. Washington, DC: World Bank.
- xlvii. Peykarju, K. et al. (2011). Studying the relationship between health and economic Growth in OIS member states. *Interdisciplinary Journal of Contemporary Research in Business*, December Vol. 3 No. 8,