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Impact of Income Inequality on Population Health in India

Abstract

There are many factors combine together to affect the health status of the population but the Income inequality hypothesis states that unequal distribution of income among individuals has detrimental impact on individual's health status. In this background, multiple regression models are exploited to estimate the relationship between population health status and income inequality in India. Infant mortality rate and life expectancy rate at birth are undertaken to measure the health status whereas Gini coefficient is undertaken to measure the income inequality. In order to estimate relative importance of income inequality, per capita GDP and literacy rate are also undertaken as independent variables. The data of Gini coefficient and literacy rates are taken from the different rounds of NSSO and the data of IMR and LER at birth are undertaken from various bulletins of SRS. Further, data of PCGDP is undertaken from economic survey. The result shows that income inequality has detrimental effect on health status, however, literacy rate also plays pivotal role in the improvement of health status.

Keywords: Income inequality, Health Status.

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Introduction

Population health refers to health status of the people. There are many factors such as housing, environmental factors, genetics, income, education level, poverty and individual's relationships with friends and family, access and use of health care services, inequalities in the societies etc., have considerable impact on population health. This means, there are many factors combine together to affect the health of individuals and communities. The health economics literature reveals that higher income leads to better health.

This means people in rich societies or countries live longer and healthier compared to poor societies or countries. But, income inequality hypothesis states that unequal distribution of income among individuals has detrimental impact on individual's health status. Wilkinson (1992) tested Income inequality hypothesis in a more quantifiable manner and argued that income inequality is one of the most powerful determinants of people's health. He revealed that people of those nations having less income inequality or equal societies are healthier as compared to the people of those nations having higher income inequalities or unequal societies. People in such societies are offered with more public goods, more social support and more social capital as they have higher social cohesion and less stress. Besides, people living in unequal societies of poor countries suffer from poor health in general.

Various studies were conducted in order to examine the association between income inequality and health status. The majority of studies (Rodgers 1979; Waldman 1992; Wilkinson 1992, 1996; Kaplan et al 1996; Kawachi et al. 1997; Russell and G. D. Smith, 1999; Ross et al 2000; Mellor and Milyo, 2002; Raphael Dennis, 2002; Deaton 2003; Wilkinson and Pickett, 2015) have reported negative relationship between health status and income inequality and revealed that greater income inequality leads to worse health of the people of nations. In this background, an attempt has been made in this article to examine the relationship between income inequality and health status of Indian population.

Objective of the Study

The main objective of this article is - To examine the impact of income inequality on population health in India

Research Methodology

In order to examine the relationship between population health status of India and income inequality in India, the following multiple regression models are estimated through OLS method:

$LER = a + b_1 * PCGDP + b_2 * GC + b_3 * LR + u_t$

$IMR = a + b_1 * PCGDP + b_2 * GC + b_3 * LR + u_t$

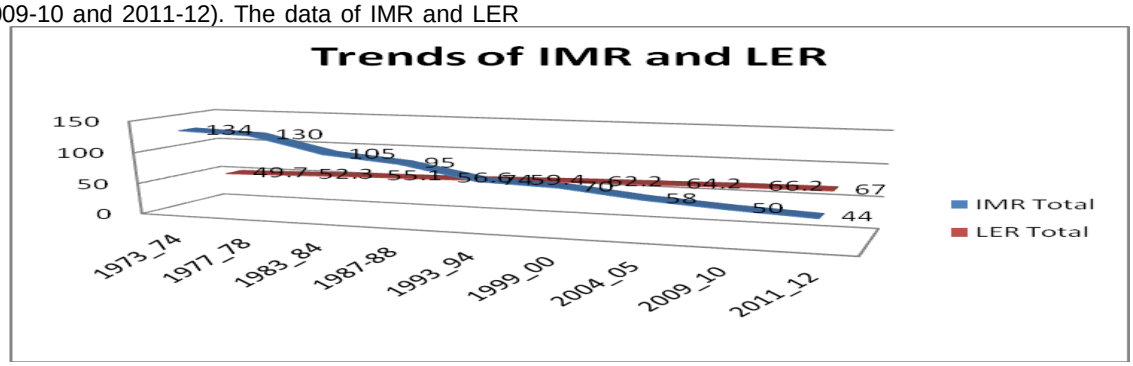
Where, LER –life expectancy rate at birth, PCGDP- per capita GDP, GC-gini coefficient and LR-literacy rate.

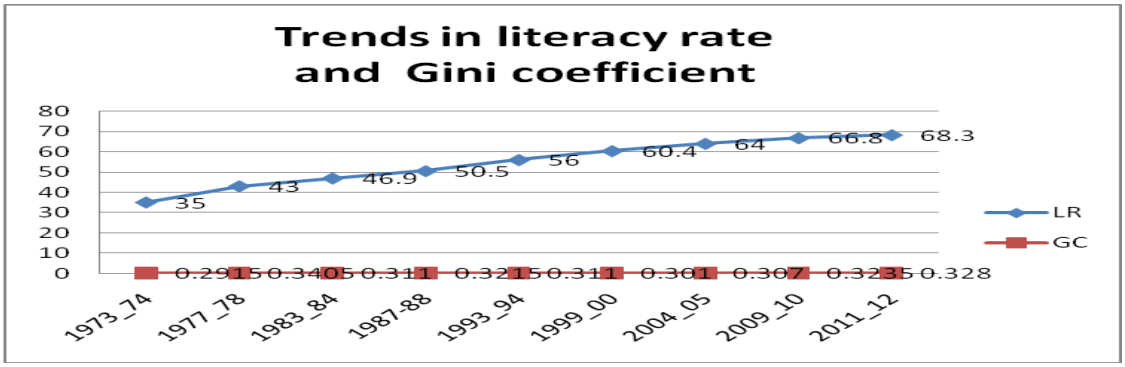
Infant mortality rate and life expectancy rate at birth are undertaken to measure the health status whereas Gini coefficient is undertaken to measure the income inequality. In order to estimate relative importance of income inequality, per capita GDP and literacy rate are also undertaken as independent variables.

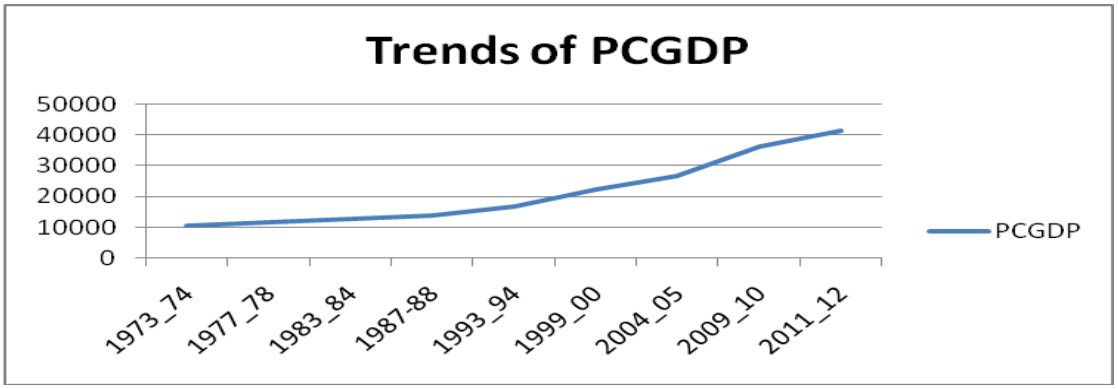
The data of Gini coefficient and literacy rates are taken from the different rounds of NSSO(1973-74,1977-78,1983,1987-88,1993-94,1999-2000,2004-05,2009-10 and 2011-12). The data of IMR and LER at birth are undertaken from various bulletins of SRS. Further, data of PCGDP is undertaken from economic survey.

Analysis and Discussion of Results

As shown in the following charts, the trends of IMR and LER clearly shows that from 1973-74 to 2011-12 IMR has decreased significantly from 144 in 1973-74 to 44 in 2011-12 while Life expectancy rate increased significantly in the same period from 49.7 to 67 years. Total literacy rate also increased significantly from 35 in 1973-74 to 68.3 in 2011-12. Trends of Gini coefficient show that the value of Gini coefficient increased in2011-12 as compared to 1972-73, while the per capita GDP increased considerably during the period from 1973-74 to 2011-12.







Regression Analysis: OLS Method

Dependent variable: LER (Life expectancy rate at birth)				
Independent Variables	coefficient	std. error	t-ratio	p-value
constant	39.21	1.126	34.82	000000367
PCGDP	0.00001	0.0000099	9.478	0.0002
GC	-22.6	3.43065	-6.586	0.0012

LR	0.46	0.00959076	47.94	0.000000075
Adjusted R-squared		0.999489		
F-statistic (3, 5)		5213.69		
P-value(F- statistic)		3.72e-09		
The Breusch-Pagan test for Heteroskedasticity				
Test statistic: LM		0.598067		
with p-value=P(Chi-square(3) > 0.598067)			0.896875	
B.K.Welsch collinearity test(VIF value)		PCGDP=5.1	GC=1.1	LR=4.97
Dependent variable: IMR (Infant Mortality Rate)				
Independent Variables	coefficient	std. error	t-ratio	p-value
constant	154.60	40.055	3.860	0.0119
PCGDP	-0.00012	0.00036	-0.4703	0.6580
GC	272.34	122.05	2.231	0.0760
LR	-2.79	0.3412	-8.188	0.0004
Adjusted R-squared		0.977810		
F-statistic (3, 5)		118.5085		
P-value(F- statistic)		0.000046		
The Breusch-Pagan test for Heteroskedasticity				
Test statistic: LM		2.155419		
with p-value=P(Chi-square(3) > 2.155419)			0.540783	
B.K.Welsch collinearity test(VIF value)		PCGDP=5.1	GC=1.1	LR=4.97

The estimated regression equations:

LER = 39.21 + 0.00001*PCGDP+ (-22.6)*GC + 0.46*LR + u_t

IMR = 154.60+ (-0.00012)*PCGDP + 272.4*GC + (-2.79) LR + u_t

The value of adjusted R squared is more than 0.98 in both the estimated equations which confirms that 98 percent variations in life expectancy rate and infant mortality rate are being explained by independent variables. This means the fitted models represent the better goodness of fit of the regression planes to the sample observations. The Breusch-Pagan test for heteroskedasticity states that the both the regression equations do not possess the problem of heteroskedasticity.

The Belsley-Kuh-Welsch collinearity test reveals that VIF values of independent variables are less than 10 which also confirm absence of the problem of multi- collinearity in the estimated regression models. Therefore, OLS method is appropriate for estimation.

The partial regression coefficients of PCGDP with life expectancy at birth and infant mortality rates reveal that PCGDP does not produce any considerable impact on the indicators of health status.

Partial regression coefficients of Gini with total life expectancy rate at birth and infant mortality rate are estimated to -22.6 and 272.34 respectively and found to be significant at 5 percent level of significance. This implies that decrease in the value of Gini coefficient (a fall in inequality) lead to a significant increase in total life expectancy rate at birth and decline in infant mortality rate. Further, partial regression coefficients of literacy rate with life expectancy rate at birth and IMR are estimated to 0.46 and -2.8 rspectively and found significant at 5 percent level of significance. This means higher the literacy rate, higher will be life expectancy and lower will be infant mortality rate. These results reveal that literacy rate plays an important role in the improvement in health status. Moreover, calculated values of F (3, 5) in both the estimated regression equations confirm that all the independent variables taken together have a significant effect on total life expectancy and infant mortality rates on on health status.

Conclusions

The analysis of the regression results reveal that individual's income level does not has considerable impact on health status, while the literacy rate plays crucial role in both increasing the life expectancy rate and in reducing infant mortality rate. As far as measure of inequality- gini coefficient is concerned, it is negatively associated with health status and plays detrimental role in the improvement in the health Status. This suggests that lowering the income inequality is the most effective policy instrument amongst others to improve the health status of the Indian population.

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