Abstract

It has been widely discussed (both in academia as well as policy circles) that improved education level of the population leads to better health and increased productivity which in turn leads to increase in income and therefore higher economic growth in developing countries. In this context, the present thesis attempts to estimate the effect of health on income and economic growth (for given level of education) in India. Using micro level data the present thesis starts with the very beginning of life cycle and estimates the effect of health on human capital formation; then it estimates the effect of calorie intake on wage among the workers in India. Next, the thesis uses macro level data to estimate the effect of average health of the working age population on income and economic growth in India. Finally, it also tests whether for a given level of health of the working age population, distribution of health or socioeconomic inequality in health affects the income and economic growth in India.

It has been established in the literature that linear growth and weight gain between mid-childhood and adolescent have significant effect on educational attainment and anthropometrics among the adolescents. According to National Family Health Survey (NFHS-3) almost 48% of the under-five aged children are stunted in India in 2005-06. Hence, using Young Lives Study, the thesis first investigates the effects of linear growth and relative weight gain on human capital accumulation. The thesis uses the mid-childhood cohorts drawn from India (Andhra Pradesh) that were first surveyed in 2002 and followed up during adolescence in 2009-10. The educational human capital was measured by years of schooling, peabody picture vocabulary test score (PPVT), and math test scores. Health human capital was measured by height, weight, body mass index, and age standardized Z-scores of height and body mass index. Results from cluster fixed effect linear regression models indicate that children’s
linear growth has positive effects on health and education capital accumulation. Also, the cluster fixed effect quantile regression shows that the positive linear growth gradient in education and health human capital is higher at a low level of theirs’ respective distributions. Further, relative weight gain has relatively higher effect at the lower distribution of age standardized body mass index. Whereas, weight gain has a relatively higher effect at the higher distribution of body mass index. The thesis highlights that mid-childhood nutritional intervention in case of stunted/underweight children can accomplish higher level of human capital accumulation that will lead to increase in their productivity during adulthood, which in turn will lead to higher incomes and thereby economic growth.

Moreover, calorie intake at a lower level of average health has a significant positive effect on physical health of the population and therefore increases the capacity to work for longer hours without absenteeism. According to the Economic Survey, human capital-intensive agriculture and service sector contributed 14.1% and 58.2%, respectively to the GDP of India in 2011-12. They also contributed 58.2% and 25.3%, respectively to the total employment in India in 2011-12. Having said this, the present thesis estimates the effect of calorie intake on wages using data from the nationally representative employment and unemployment and consumer expenditure surveys conducted by the National Sample Survey Organization of India. In order to take into account the endogeneity and heterogeneity in the effects, the thesis uses two-stage least square (2SLS) and instrumental variable quantile regression (IVQR) techniques for the above estimation. Results suggest that higher calorie intake positively affects wages of workers. That is, a 10% increase in per capita calorie intake per day leads to a 2.4% increase in daily wages of workers. The wage effect varies by occupation type and distribution of wages; the effect of calorie intake on wages is higher at the lower quantiles of wage distribution and for the non-
elementary workers. The findings of the thesis suggest a policy of public nutritional supplementation at low and median level of the wage distribution for the maximization of wage gain from the public nutritional expenditure.

The thesis also examines the effects of health (measured in terms of adult survival probability) on income (measured in terms of per capita net state domestic product) and economic growth for India during the last three decades (1983-2011). For the estimation cross-section time-series (panel) data of the 15 major states for the period 1983 to 2011 has been constructed using data from the Reserve Bank of India, the statistical report of the sample registration system (SRS) of Government of India and the nationally representative ‘socioeconomic surveys’. The fixed effects regression results indicate that a 10% increase in adult survival probability increases the income level by about 12%. Also, a 10% increase in growth in adult survival probability results in an increase in economic growth rate by about 7.4%. Further, instrumental variable generalised methods of moments regression estimates indicate that a 10% increase in adult survival probability increases the income by about 8%; where as a 10% increase in the growth in adult survival probability has the potential to achieve an increase in economic growth by about 26%. The results call for policies for improving the poor health infrastructure in the country and policies, which can stimulate the demand and supply of health facilities to achieve higher economic growth in India.

There has been a general idea in the past that irrespective of the distribution of average health, average health of the population leads to the high incomes and economic growth. Contrary to this, a few studies in the recent past have shown that health inequalities impede income and economic growth in developing countries. Given this, there is compelling evidence that there
are profound socioeconomic and inter-regional health inequalities in India, and these inequalities have been increasing over time. In this context, the present thesis also examines the effects of health inequality (measured in terms of inequality in under-five child mortality) on economic growth (growth in per capita net state domestic product) in India by constructing a cross-state panel data of fifteen major states for the period, 1983-2006. The results indicate that a 10 per cent decrease in health inequality results in up to 2% increase in per capita income. Moreover, a 10 per cent decline in health inequality increases the economic growth rate by about 0.7% in India. Clearly, India has the potential to achieve higher economic growth if the country can reduce the rampant health inequalities along with the improvement in the average health of the population in the country. Such efforts will also address the issue of inclusive and sustainable development goals.