THE IMPACT OF LIFE EXPECTANCY ON HEALTH-CARE SPENDING AND ECONOMIC GROWTH IN INDIA.

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ABSTRACT

Introduction

Life expectancy is one of the primary indicators of the social-economic, health condition, and economic development of a country. It also reflects the multidimensional indicators like happiness, social, economic, and health of the people living in the country. Our main objective is to determine the impact of Life expectancy on economic growth changes and health care expenditure and to examine the trend of life expectancy according to the gender difference.

Materials and methods

We have source the data from World Bank Developmental Indicators from 2005 to 2017, whereas health expenditure an independent variable and life expectancy as a dependent variable. We used ordinary least squares (OLS) regression to estimate the life expectancy on economic growth and health care expenditure in Python. (Open sourcestatistical Software)

Results

The life expectancy was higher in females than males in the following years. Our Results suggested that an increase in 1$ in Current Health expenditure (CHE) per capita will increase 0.25 years in life expectancy, 1$ increase in Domestic general government health expenditure (DGGHE) per capita, PPP (current international $) will increase in 0.27 years and one dollar increases in Domestic general government health expenditure per capita; PPP (current international $) will increase 0.06 years of life expectancy in India. P<0.05 was taken as statistically significant.

Conclusion
Private and public health expenditures have different effects on health outcomes in each health care system, and policymakers should choose an optimal combination of private and public health expenditures. Participation of the human health force in macro and micro policy-making is also required, and other determinants of healthcare costs should be scrutinised.

Keywords: Life expectancy, Quality of life, Health expenditures, Health outcomes

I. INTRODUCTION

Life expectancy is a standard overall measure of health status in populations and is determined by the mortality pattern over all ages. It is also relatively independent of the age structure of the population.(1) It indicates the condition of health of the people of the country, including the impacts of mortality and morbidity.

Life expectancy, is a result of many factors besides health sector inputs, including economic factors (level and distribution of income), social factors (education, in particular), cultural factors (religion, diet and other health related behaviours), environmental factors related to water supply, sanitation, housing and pollution, ecological factors that determine climate, food supply and endemic disease, and several other influences.(2)

According to Sample Registration System (SRS), India's overall life expectancy at birth increased from 49.7 in 1970-75 to 69.4 in 2014-18. The annual increase in LE was 2-3 years between 1970 and 1990, and the improvement has been a mere 0.4 years in the last decade.(3)

Japan, which has the highest life expectancy at birth (among large countries) at 84.5 years, reached India's current level of LE in 1960, or 60 years ago, and China reached it in 1990, or 76.7 years ago. According to the United Nations Human Development Report 2019, Bangladesh and Nepal, which had a lower life expectancy in 1980, now came to India with a life expectancy of 72.1 and 70.5 years, respectively. Pakistan has the lowest life expectancy in the region, at 67.1 years.(4)

The health expenditure varies depending on the health-care system. Financing is an issue in some health-care systems. A fair distribution of resources is required to achieve the desired level of development. Based on this mechanism, health expenditures can increase health capital, and also consequently increase human capital.(5)

Nevertheless, health services undoubtedly affect premature mortality through preventive and treatment endeavours, and one might expect higher life expectancy with higher health expenditure. The present study examined the level of the health expenditure and economic growth and life expectancy from 2005 to 2017.

II. MATERIALS AND METHODS

We analysed the annual time data of India from 2005 to 2017. The data on determinants of health expenditure and life expectancy were sourced from the World Bank.(6) We had Current health expenditure (% of GDP), Current health expenditure per capita current, US$ (CHE), Current health expenditure per capita PPP current international $(CHE), Domestic general government health expenditure per capita current US$(DGGHE), Domestic general government health expenditure,% of current health expenditure (DGGHE), Domestic general government health expenditure per capita PPP current international $(DGGHE), Domestic private health expenditure % of current health expenditure(DPHE), External health expenditure per capita PPP current international$(EHE) as an independent variable Life expectancy at birth, male (years), female (years) and Life Expectancy from Birth(Years) as a Dependent Variable. Ordinary least square regression analyses have been done through the Python statistical software package.

III. RESULTS

Table 1 show that descriptive statistics of average, standard deviation (SD), and number of observations (on the basis of which the statistics were calculated) were presented. The average life expectancy was about 66.00 years (SD 1.55 years). The Current health expenditure per capita was about US$47.31 (SD US$15.28). Also, the averages of public health expenditure as a share of GDP were about 3.52 % (SD 0.016%).

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Std. Dev</th>
<th>Minimum</th>
<th>Maximum</th>
<th>95% CI for Mean</th>
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<thead>
<tr>
<th></th>
<th>Lower bound</th>
<th>Upper bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life expectancy at birth, total (years)</td>
<td>66.00</td>
<td>67.94</td>
</tr>
<tr>
<td>Current health expenditure per capita, PPP (current international $)</td>
<td>170.68</td>
<td>198.30</td>
</tr>
<tr>
<td>Current health expenditure per capita</td>
<td>47.31</td>
<td>55.05</td>
</tr>
<tr>
<td>External health expenditure per capita, PPP (current international $)</td>
<td>1.61</td>
<td>1.89</td>
</tr>
<tr>
<td>Domestic general government health expenditure per capita (current US$)</td>
<td>11.84</td>
<td>14.29</td>
</tr>
<tr>
<td>Domestic general government health expenditure per capita, PPP (current international $)</td>
<td>42.52</td>
<td>51.13</td>
</tr>
<tr>
<td>Domestic private health expenditure (% of current health expenditure)</td>
<td>74.42</td>
<td>76.06</td>
</tr>
<tr>
<td>Current health expenditure (% of GDP)</td>
<td>3.52</td>
<td>3.62</td>
</tr>
<tr>
<td>Domestic general government health expenditure (% of current health expenditure)</td>
<td>24.55</td>
<td>26.32</td>
</tr>
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</table>

**Trend analysis**

Figure 1. Shows that the trend of life expectancy by sex. As the year, the life expectancy rate is increasing among both males and females. Throughout the years, females have been found to have a higher life expectancy rate than males. In 2005 the female life expectancy in India increased from 65.35 years in 2005 to 70.42 years in 2017, while male life expectancy increased from 63.68 years in 2005 to 68 years in 2017. The gap between male and female was 1.66 years in 2005, narrowing to 2.42 years in 2017.

![Figure 1 Life Expectancy of males and females](image-url)
Table 2 shows the result of Ordinary Least Square analysis between life expectancy and predictors variables respectively. If current health expenditure per capita will increase by one dollar, then life expectancy will increase by 0.25 years (95% CI, 0.08-0.41). And, if domestic general government health expenditure (% of current health expenditure) increase by one percent, then life expectancy will increase by 0.27 years (95% CI, 0.03-0.50). Further, one dollar increases in Domestic general government health expenditure per capita; PPP (current international $) will increase 0.06 years (95% CI, 0.03-0.10) of life expectancy in India.

Table 2: Ordinary least squares (OLS) regression was performed between life expectancy and other predictor variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient</th>
<th>95 % CI</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current health expenditure per capita</td>
<td>0.25</td>
<td>0.08-0.41</td>
<td>0.008*</td>
</tr>
<tr>
<td>Domestic general government health expenditure (% of current health expenditure)</td>
<td>0.27</td>
<td>0.03-0.50</td>
<td>0.029*</td>
</tr>
<tr>
<td>Domestic general government health expenditure per capita (current US$)</td>
<td>-0.44</td>
<td>-0.81-0.06</td>
<td>0.004*</td>
</tr>
<tr>
<td>Domestic general government health expenditure per capita, PPP (current international $)</td>
<td>0.06</td>
<td>0.03-0.10</td>
<td>0.006*</td>
</tr>
</tbody>
</table>

* P-value less than 0.05 is considered as statistically significant

IV. DISCUSSION:

Our study has clearly explained relationship between life expectancy and health expenditure.

The study by Filmer and Pritchett(7) reveal that an increase of total health expenditures had impact on life expectancy at birth and Barlow and Vissandjee(8) shows the same study results. but contradicting the findings of Novignon et al. (9)

A Study by Nixon et.al(10) established that public health care expenditure and private health care expenditure had no impact on life expectancy at birth because life expectancy is affected by some other external factors such as diet, lifestyle, physical activity and environment.

Past empirical studies on the relationship between healthcare expenditure and health sector outcomes provide conflicting views. For example, Rana, et al.,(11) Anand and Ravallion,(12) and Patricio et al. revealed a positive relationship between public healthcare expenditure and health sector performance for 30 OECD countries.

Study by Mathers et al(13) exploring healthy life expectancies via disability adjusted life years encompassing almost all global regions provided firm evidence that life expectancy increases faster than total life expectancy together with increasing health expenditure per capita

Xu et al(14) found a positive relationship between government health expenditure and the percentage of the population over 60 years old in the lower-middle-income countries.

Caliskan has examined the relationship between individuals aged 65 years or more and the total public and private health expenditure per capita for OECD countries between 1984 and 2005. The study has found that there are positive and significant relationships between the proportion of the population aged 65 years and over and health expenditure indicators.

In contrast, in the study conducted by Maestas et al,(15)they found that a 10% increase in the population aged 60 years or over decreases the growth rate or GDP per capita by 5.5%.
V. CONCLUSION

The study concluded that prioritizing health care spending, appropriate resource allocation, improving per capita income, and access to healthcare workers also play essential roles in improving people's health. In addition, in countries with national health services, the public sector should be more responsible for the country's health due to the different impacts of private and public health expenditures on health outcomes in each health care system. Similarly, in countries with a mixed economy, the private sector should bear a greater share of responsibility for the country's health. As a result, countries should choose an appropriate mix of healthcare spending based on the types of healthcare systems.

REFERENCES: