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Healthcare Cost and Education Level in India: A Temporal Analysis

Karuna Rathore (Post-Graduate Diploma in Hospital Management (PGDHM), Perusing PhD Research Scholar at Mohanlal Sukhadia University - Udaipur

ABSTRACT Health and education are the important factors which determine the phase of growth of a country. In this study the status of health and education over a period of time India has been assessed. Education in turn is one of the important determinants of health as it leads to health awareness and healthy lifestyle practices of people the central and state. Government is taking lot off initiatives to improve the status of health of the people and spectacular improvement has been achieved but still there is a lot more to be done to achieve the "health for all" target. The compound annual growth rate and liner trend equation methods have been used. The study indicated significant annual growth in health expenditure per capita (8.09%), enrollment ratio of pre-primary (16.12%) and secondary (3.16%). Linear trend equation for health expenditure related indicators and out-of-pocket health expenditure proved to be significant. Time alone attributed for 53% of variation in enrollment, whereas variation health expenditure per capita is affected by 91% due to time factor. Education level related Indicators: gross enrolment ratio; pre-primary, gross enrolment ratio; secondary, have 97% and 98% of variation due to time factor. All indicators showed remarkable growth by the year 2020. The difference in gross enrollment ratio for primary and secondary level will decline in 2020 compared with year 2007. The health expenditure and education related indicators were examined. The study indicated significant increase in health expenditure and education level in India. Health expenditure per capita and enrollment in primary and secondary ratio are growing at highest rate. All indicators followed linear trend. The gap in gross enrollment ratio of primary and secondary increased from (45.89%) year 2007 to (26.06%) 2020 as number of students enrolling for secondary education is growing. This is due to government initiatives, which leads to improvement. However there is need for further improvement and the public private partnership can help improve the status of health and education in India.

KEYWORDS : GDP (Gross Domestic Product), WHO (World Health Organization), CAGR (Compound Annual Growth Rate), GER (Gross Enrollment Ratio)

Introduction

An old saying stays very true that "Health is the Biggest Wealth" and everyone tries to maintain good health. According to World Health Organization (WHO definition of Health, n.d.) health is define as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. Health is multifactorial, many factors combine together to affect the health of individuals and communities. Whether people are healthy or not, is determined by their circumstances and environment. To a large extent, factors such as where we live, the state of our environment, genetics, our income and education level, and our relationships with friends and family all will have considerable impacts on health, whereas the more commonly considered factors such as access and use of health care services often have less of an impact (The determinants of health, n.d.).

Good health status can be maintained but then falling sick and getting diseases is again not very uncommon and to conquer this and to maintain good health; people need to pay substantial cost. Lot of focus has been put on health by Government of India by means of various national health programs. But 'Health for all by 2000 AD' remains as a distant mirage and the slogan has been rephrased as 'Health for all in 21st Century' (Patil, Somasundaram&Goyal, 2012).Health spending is highly unequal across the globe (Madhavi, 2014). Indian government is making efforts but then probably not sufficient and results are yet not achieved.

Indian healthcare is a USS 17 billion industry accounting for 4% of GDP. Public health care system is responsible for spending of 1% of the GDP (effectively about Rs1000 per capita). In contrast approximately 3% of the GDP (an average of Rs.3675 per capita) per annum is spent in the private sector on healthcare. (Mehra, 2015)

The inability of the public health sector has forced poor and deprived sections of the population to seek health services from the private sectors (Raman &Bjorkman, 2006). The private health sector in India is highly unregulated prices for services are not universal and are charges as per the wish of service providers, which makes a person to pay high cost of it. As a result the cost of treatment rose at a double-digit pace of growth, outpacing average inflation in both rural and urban India over the past decade, according to the recently published results of a cross-national survey on health conducted by the (Bhattacharya and Jain, 2015).The major expenditure on health in India is out-of-pocket which regards people further into poverty or lower health status because of affordability issue.

Health and education are the important factors to determine the growth of a country. In this study the status of health and education over period of time have been studied. Education is one of the important determinants of health as it leads to health awareness and healthy lifestyle practices of people. Government is taking a lot of initiatives to improve the status and improvement is observed but still there is need for more focus.

2. Research Objective:

The following are the specific objective of the study:

1. To study trend of healthcare expenditure pattern in India.
2. To study trend of education level in India.
3. To compare healthcare expenditure with education

3. Methodology

In this paper growth rate and trend in healthcare expenditure and education level in India have been analyzed.

3.1 Data collection

Secondary sources of data were used and captured from related website including The World Bank Website.

3.2 Research Tools:

Compound annual growth rate has been worked out using exponential method.

Yt=abt where b=1+r and r is the CAGR. The trend equation were worked out using the model Yt=a+bt.

The estimation of linear equation and growth rate was measure using SPSS version 16.0.

3.4 Hypothesis:

a) H01: Health expenditure related indicator follows the linear trend.
b) H02: Difference in primary and secondary enrollment ratio is reducing over period of time

4. Analysis and Interpretation of data

4.1 Health expenditure pattern in India

Health expenditure and its pattern in India were certain using following concepts as per The World Bank:

Out-of-pocket health expenditure (% of total expenditure on health) is defined as any direct outlay by households, including gratuities and in-kind payments, to health practitioners and suppliers of pharmaceuticals, therapeutic appliances, and other goods and services whose primary intent is to contribute to the restoration or enhancement of the health status of individuals or population groups. It is a part of private health expenditure (Health Data, n.d.).

Health expenditure per capita (current US$)-Total health expenditure is the sum of public and private health expenditures as a ratio of total population. It covers the provision of health services (preventive and curative), family planning activities, nutrition activities, and emergency aid designated for health but does not include provision of water and sanitation. Data are in current U.S. dollars(Health Data, n.d.).

Health expenditure, private (% of GDP)-Private health expenditure includes direct household (out-of-pocket) spending, private insurance, charitable donations, and direct service payments by private corporations(Health Data, n.d.).

4.2 Education status of Indian population

It was analyzed by following indicators referred in study as education related indicator as per The World Bank:

Gross enrolment ratio pre-primary both sexes (%)-Total enrollment in pre-primary education, regardless of age, expressed as a percentage of the total population of official pre-primary education age. GER can exceed 100% due to the inclusion of over-aged and under-aged students because of early or late school entrance and grade repetition(Education Data, n.d.).

Gross enrollment ratio primary both sexes (%)-Total enrollment in primary education, regardless of age, expressed as a percentage of the population of official primary education age. GER can exceed 100% due to the inclusion of over-aged and under-aged students because of early or late school entrance and grade repetition(Education Data, n.d.).

Gross enrolment ratio secondary both sexes (%)-Total enrollment in secondary education, regardless of age, expressed as a percentage of the population of official secondary education age. GER can exceed 100% due to the inclusion of over-aged and under-aged students because of early or late school entrance and grade repetition(Education Data, n.d.).

4.3 Compound Annual Growth Rate (CAGR)

The compound annual growth has been measured over period of time for health and education related indicators to see the growth, the estimated CAGR are as given in Table-1.

Table-1: Compound Annual Growth Rate of Health Expenditure and Education Related Indicator

Category	Indicator	CAGR
A. Health Expenditure Related Indicators	1. Out-of-pocket health expenditure (% of total expenditure on health) (Yr 1995-2014)	-0.39
	2. Health expenditure per capita (current US$) (Yr1995-2014)	8.09
	3. Health expenditure, private (% of GDP) (Yr 1995-2014)	0.5
B. Education Level Related Indicator	1. Gross enrolment ratio, pre-primary, both sexes (%) (Yr1995-2011)	16.12
	2. Gross enrollment ratio, primary, both sexes (%) (Yr2007-2013)	0.05
	3. Gross enrolment ratio, secondary, both sexes (%) (Yr 1999-2013)	3.16

Growth rate among health expenditure related indicators is found as; Out-of-pocket health expenditure (% of total expenditure on health) is -0.39, Health expenditure per capita is8.09and Health expenditure, private (% of GDP) is 0.5.

Growth rate in education related indicator is observed as follows; Gross enrolment ratio, pre-primary, both sexes is16.12, Gross enrollment ratio, primary, both sexes(%) is 0.05 and Gross enrolment ratio, secondary, both sexes (%) is 3.16.

Among all six indicators highest growth is observed in: Health expenditure per capita and enrollment ratio of pre-primary and secondary education. That shows enrollment for education in the country is growing at higher rate. Education leads to health awareness, healthy lifestyle practices and better quality of life. Probably that is the reason of rise in health expenditure per capita and private sector expenditure. Decline in out-of-expenditure may be due to increased awareness about health insurance (non-cash schemes).

4.4 Trend Equation

Using linear trend equation the intercept, slope, standard error, t value and R2have been calculated:

$Yt=a+bt$
$b\,(Slope)=n\Sigma tY-(\Sigma Y)(\Sigma t)/\,n\Sigma t2-(\Sigma t)2$
$a(Intercept)=\Sigma Y/n-b(\Sigma t/n)$

Table-2: Results of Liner Trend Equation in Health Expenditure and Education Related Indicator

Details of Trend Equation								
Category	Indicator	Intercept (a)	Slope (b)	Standard Error of Intercept	Standard Error of Slope	t value of Intercept	t Value of Slope	R2
A. Health Expenditure Related Indicators	1. Out-of-pocket health expenditure (% of total expenditure on health) (Yr 1995-2014)	69.65	-0.31	0.81	0.06	85.95	4.59	0.53

	2. Health expenditure per capita (current US$) (Yr1995-2014)	2.35	3.28	2.87	0.24	0.81	13.67	0.91
	3. Health expenditure, private (% of GDP) (Yr 1995-2014)	3.08	0.008	0.06	0.005	51.31	1.62	0.12
B. Education Level Related Indicator	1. Gross enrolment ratio, pre-primary, both sexes (%) (Yr1995-2011)	0.45	3.40	1.37	0.13	0.33	25.42	0.97
	2. Gross enrollment ratio, primary, both sexes (%) (Yr2007-2013)	110.12	-0.082	0.77	0.17	142.23	0.47	0.044
	3. Gross enrolment ratio, secondary, both sexes (%)(Yr 1999-2013)	40.23	1.94	0.52	0.057	76.95	33.84	0.98

The liner trend equation showed that slope is positive and significant for health expenditure per capita, health expenditure, private (%), gross enrolment ratio for pre-primary and secondary both sexes. Whereas it is negative and significant in out-of-pocket health expenditure and gross enrollment ratio, primary.

The linear trend equation result of Health Expenditure related Indicators showed that: out-of-pocket health expenditure shows 53% of change in it is explained due to time, whereas health expenditure per capita is affected by 91% due to time factor.

Education Level Related Indicators shows following results: gross enrolment ratio; pre-primary, gross enrolment ratio; secondary, have 97% and 98% of variation due to time factor.

There are many other factors which contribute to improvement in health expenditure and education level government initiative right to education is a successful initiative has help to improve the enrollment ratio of pre-primary to secondary and health for all for improvement of health expenditure related indicator. Government has also encouraging private organization to enter in public private partnership to improve health status. Strengthening of plans can lead to further improvement and attainment of goals.

4.5Forecasted Health Expenditure and Education Level in Year 2020

Trend equation estimated using ordinary least squares method for forecast of indicators in year 2020. It is found that the growth in health expenditure per capita, pre-primary and secondary enrollment will go up remarkably.

Table-3: Forecast of indicators for year 2020

Category	Indicator	Observed Value Year 2010 (%)	Forecasted Value Year 2020 (%)
A. Health Expenditure Related Indicators	1. Out-of-pocket health expenditure (% of total expenditure on health) (Yr 1995-2014)	63.37	61.59
	2. Health expenditure per capita (current US$) (Yr1995-2014)	59.18	87.63
	3. Health expenditure, private (% of GDP)(Yr 1995-2014)	3.12	3.28
B. Education Level Related Indicator	1. Gross enrolment ratio, pre-primary, both sexes (%) (Yr1995-2011)	53.40	88.85
	2. Gross enrollment ratio, primary, both sexes (%) (Yr2007-2013)	109.18	108.97
	3. Gross enrolment ratio, secondary, both sexes (%) (Yr 1999-2013)	63.29	82.91

734.6. Gap in enrollment ratio of primary & secondary education for year (2007-2020)

Difference in Gross enrollment ratio for primary and secondary (Difference = enrollment ratio secondary – enrollment ratio primary). The gap in gross enrollment ratio of primary & secondary education in year 2007was (45.89%)and in year 2020 will be (26.06%),gap is reducing as the number of students enrolling for secondary education is growing.

H01: Null hypothesis is accepted as health expenditure related indicator follows the linear trend
H02: Null hypothesis is accepted as difference in primary and secondary enrollment ratio is reducing from year 2007-2020.

5. Limitations

Data for education related indicator was not available for long period. Yes, time is one of the important reasons for improvement but not the sole reason for increase in health expenditure. There are many other factors which contribute which can also be studied to see their effects.

6. Scope for Further Research:

Other factors affecting health expenditure can also be studied; one can also categorize the strongly associated factor.

7. Conclusions: Study examined health expenditure and education related indicators. Study indicates significant increase in health expenditure and education level in India. Health expenditure per capita, enrollment ratio for primary and secondary ratio is growing at highest rate. All indicators follows linear trend and are significant. The gap in gross enrollment ratio of primary & secondary from year 2007 (45.89) to 2020 (26.06) is reducing as number of students enrolling for secondary education is growing. This is due to government initiatives, which leads to improvement. Our findings suggest that there is need for further improvement; public private partnership can help improve the status of health and education in India.

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