

**AN OVERVIEW OF HEALTH CARE EXPENDITURE IN INDIA**

**Thesis Submitted in Partial Fulfillment of the Degree of  
Master of Philosophy (M.Phil)**

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### DECLARATION

I hereby declare that the Dissertation entitled “An Overview of Health Care Expenditure in India” submitted to Avinashilingam Institute for Home Science and Higher Education for Women for the degree of Master of Philosophy (M.Phil) is a record of research work done by me during the period August 2016 to July 2017 under the guidance of Dr.Sherly Thomas, Professor, Department of Economics, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore and has not formed the basis for the award of any Degree/ Diploma/ Associate ship/ Fellowship in this university or any other university or other similar institutions of higher learning.

  
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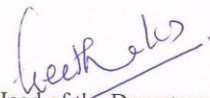
  
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**CERTIFICATE**

This is to certify that dissertation entitled “An Overview of Health Care Expenditure in India” submitted to Avinashilingam Institute for Home Science and Higher Education for Women for the degree of Master of Philosophy (M. Phil) by Sukanya. A is the record of original research work carried out by her during the period August 2016 to July 2017 under my guidance and supervision and that this work has not formed the basis for the award of any Degree/ Diploma/ Associate ship/ Fellowship or other titles in this University or any other University or Institutions of Higher Learning.



Signature of the Supervisor



Signature of the Head of the Department

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## LIST OF CONTENT

<b>S.NO</b>	<b>CONTENT</b>	<b>PAGE</b>
<b>I</b>	<b>INTRODUCTION</b>	<b>1</b>
<b>II</b>	<b>REVIEW OF LITERATURE</b>	<b>14</b>
<b>III</b>	<b>METHODOLOGY</b>	<b>51</b>
<b>IV</b>	<b>RESULTS AND DISCUSSION</b>	<b>61</b>
<b>V</b>	<b>SUMMARY AND CONCLUSION</b>	<b>99</b>
<b>VI</b>	<b>BIBLIOGRAPHY</b>	<b>104</b>

## LIST OF TABLES

TABLE NO	TITLE OF THE TABLES	PAGE NO
1	<b>PUBLIC EXPENDITURE ON HEALTH</b>	6
2	<b>PER CAPITA GOVERNMENT EXPENDITURE ON HEALTH</b>	7
3	<b>HEALTH INDICATORS IN BRICS NATIONS</b>	8
4	<b>SEX RATIO</b>	62
5	<b>LITERACY RATE</b>	64
6	<b>CRUDE BIRTH RATE</b>	66
7	<b>CRUDE DEATH RATE</b>	68
8	<b>INFANT MORTALITY RATE</b>	70
9	<b>NUMBER OF HOSPITALS PER 000' POPULATION</b>	73
10	<b>NUMBER OF BEDS PER 000' POPULATION</b>	75
11	<b>NUMBER OF DOCTORS PER 000' POPULATION</b>	77
12	<b>NATIONAL STATE DOMESTIC PRODUCT</b>	78
13	<b>HEALTH EXPENDITRE IN INDIA</b>	81
14	<b>HEALTH EXPENDITURE AND NET STATE DOMESTIC PRODUCT</b>	86
15	<b>PER CAPITA NATIONAL STATE DOMESTIC PRODUCT</b>	87
16	<b>PER CAPITA HEALTH EXPENDITURE</b>	91

<b>17</b>	<b>THE EFFECT OF PER CAPITA PUBLIC HEALTH EXPENDITURE ON HEALTH STATUS IN STATES OF INDIA RESULTS OF SIMPLE REGRESSION</b>	<b>96</b>
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## LIST OF FIGURES

<b>FIGURE NO</b>	<b>TITLE OF THE FIGURES</b>	<b>PAGE NO</b>
<b>1</b>	<b>PER CAPITA NATIONAL STATE DOMESTIC PRODUCT 2001</b>	<b>88</b>
<b>2</b>	<b>PER CAPITA NATIONAL STATE DOMESTIC PRODUCT 2011</b>	<b>89</b>
<b>3</b>	<b>PER CAPITA NATIONAL STATE DOMESTIC PRODUCT 2015</b>	<b>89</b>
<b>4</b>	<b>PER CAPITA HEALTH EXPENDITURE 2001</b>	<b>92</b>
<b>5</b>	<b>PER CAPITA HEALTH EXPENDITURE 2011</b>	<b>93</b>
<b>6</b>	<b>PER CAPITA HEALTH EXPENDITURE 2015</b>	<b>93</b>

# CHAPTER I

## INTRODUCTION

Health is a positive state of well being in which harmonious development of physical and mental capacities of individual lead to enjoyment of rich and full life. Health is vital for concurrent and integrated development of the individual and community and for socio economic development of the country. Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity World Health Organisation (WHO, 2000).

Public Health is the science and art of promoting health, preventing disease and prolonging life through the organized efforts of society. Worldwide, there seems to be a consensus on measuring health systems in terms of improving the health status, enhancing patient satisfaction and providing financial risk protection. In 2000, the WHO expanded the definition to include a reduction in disparities for improving health status, being mindful of the patient's need for privacy and confidentiality and providing services promptly and with courtesy as characteristics of a responsive system and sharing the financial burden in accordance with the ability to pay as being a fair form of health financing. There is however, little consensus on what constitutes an ideal health system in universally acceptable terminology to enable better inter country comparisons. This is because, unlike any other sector, health systems are highly contextualized and influenced by various exogenous factors such as societal values, epidemiology and disease burden, availability of financial resources, technical capacity, individual preferences and the nature of demand. Technological innovation in the health sector has improved the quality of life but has also increased costs. In countries that have no social insurance and where the role of the state is limited, people spend a substantial proportion of their incomes on seeking medical treatment, and in the process, get impoverished, thus widening disparities in the health status. To contain spiraling prices and distortions created by market failures such as moral hazard, asymmetry in information, induced demand etc., countries resort to multiple policy instruments.

Good health is both the means and end of development. A healthy population is a pre-requisite for economic growth, in turns this income growth can improve human lives through the provision of a decent education, good health care facilities, increased job opportunities, improved job security, good governance and all other requirements for human well being.

## **THE HEALTH SYSTEM IN INDIA**

Health plays a vital role in making an individual and society productive, efficient and optimal. There is a positive correlation between health and development, both social and economic development. Human development fits into both of these areas attracting and magnifying the importance of health. Health is one of the vital indicators reflecting the quality of life and therefore it has been rightly said, 'Health is wealth'. The state's cognizance of importance of health and expression of inability of private sector to invest on health in the early years of planning demanded active participation of state in providing universal healthcare to all irrespective of caste, gender and religion. The health system in India consists of a public sector, a private sector and an informal network of providers of care operating within an unregulated environment, with no controls on what services can be provided by whom, in what manner, and at what cost, and no standardized protocols to help measure the quality of care (Rao, 2005).

The Constitution of India places the responsibility of health of the citizens in the hands of the State in Indian federal system. But the Union government finances national public health programmes which have high social returns, or which are characterized as public goods. Central government efforts at influencing public health through five year plans, coordinated planning with the states and on sponsoring major national health programs. In this direction, state started many health programmes to eradicate diseases such as polio, malaria, tuberculosis, leprosy, cholera, food and nutrition supplement programmes, hospitals and Primary health care centers, and maternity health supporting programmes.

## **HEALTH INDICATORS**

Health is a primary and more essential input for human resources development of a country. A chronically sick person, in spite of high income and education cannot enjoy life and would contribute very little to the society. The health of population and individual is inextricably bound up with development. Overcoming health related barriers to the accumulation of human capital might be an important pre condition for achieving higher income level. Therefore, the expenditure on health is not only a means to the welfare of the society but also an end to the economic development. Investment in the health of people is considered to be a development strategy. A comparison of health indicators with economic indicators at a country level shows

that the countries whose inhabitants enjoy the highest life expectancy tend to be those with the highest income per person. On the other hand, development, like health is equally an exclusive concept. Development is not only the process of increasing per capita income but also a process of improving the quality of all aspects of human life. Growth in national output will tend to increase the health expenditure.

A health indicator is a single measure that is reported regularly and that provides relevant and actionable information about population health and health system performance and characteristics. An indicator can provide comparable information, as well as track progress and performance over time. Health indicators support provinces, regional health authorities and facilities as they monitor the health of their populations and track how well their local health systems function. Based on health indicators policies can be framed and executed. There are several indicators like sex ratio, literacy rate, crude birth rate, crude death rate, infant mortality rate, maternal mortality rate. However the current study selected only few indicators like Sex ratio, Crude Birth Rate, Crude Death Rate, Literacy Rate, Infant Mortality Rate, Infrastructure and Health finances.

The sex ratio in India has come down to 914 in the 2011 from 927 in the 2001. There are various reasons for decline in sex ratio such as foeticide, infanticide dowry deaths and violence against women.

Economic prosperity of a country entirely depends on the economic resources it has and human resource is an important part of economic resource, effective utilization of the human resource becomes very crucial for the country's economic progress and thus literacy plays all the more an important role in determining India's growth. Infant mortality is an indicator of the health status not only of infants, but also of the whole population.

## **HEALTH FINANCING**

India's health financing system is a cause of and an exacerbating factor in the challenges of health inequity, inadequate availability and reach, unequal access, and poor quality and costly health care services. Low per person spending on health and insufficient public expenditure result in one of the highest proportions of private out of pocket expenses in the world. Citizens receive low value for money in the public and the private sectors. Increased public funding combined with flexibility of financial transfers from centre to state can greatly improve the

performance of state operated public systems. Enhanced public spending can be used to introduce universal medical insurance that can help to substantially reduce the burden of private out of pocket expenditures on health. Increased public spending can also contribute to quality assurance in the public and private sectors through effective regulation and oversight. In addition to an increase in public expenditures on health, the Government of India will however, need to introduce specific methods to contain costs, improve the efficiency of spending, increase accountability, and monitor the effect of expenditures on health (Shiva, 2011).

The nature of financing defines the structure, the behaviour of different stakeholders and quality of outcomes. It is closely and indivisibly linked to the provisioning of services and helps define the outer boundaries of the system's capability to achieve its stated goals. Health financing is by a number of sources,

- ❖ The tax-based public sector that comprises local, State and Central Governments, in addition to numerous autonomous public sector bodies,
- ❖ The private sector including the not for profit sector, organizing and financing, directly or through insurance, the health care of their employees and target populations,
- ❖ Households through out-of-pocket expenditures, including user fees paid in public facilities,
- ❖ Other insurance social and community based, and
- ❖ External financing (through grants and loans).

## **DEMAND AND SUPPLY OF HEALTH FINANCING**

The healthcare system in low and middle income countries is financed largely through out of pocket (OOP) payments. This is one of the most unequal forms of healthcare financing, posing a barrier to access (Berman et.al., 2010) reducing a considerable section of society even the well off into poverty and impoverishment, and leading to a direct loss of a household's well being (Wagstaff and van Doorslaer 2003). In order to ensure equitable access to healthcare and protect households from the devastating consequences of OOP payments, health sector reforms in most countries have focused on strategies to achieve Universal Health Coverage (UHC). An effective financing strategy is the fundamental pillar of an efficient healthcare system, ensuring equitable and affordable healthcare services. Supply and demand side health financing strategies

are generally discussed for universal entitlement of healthcare services to every citizen. A supply side financing strategy (SFS) strengthens essential primary, secondary and tertiary healthcare services, financed through general taxation. Under SFS, health services are provided through the government healthcare system. One of the major strengths of SFS is that it provides universal healthcare services almost free or at low cost at the point of delivery to all its citizens. In addition, SFS can provide comprehensive services to the remote areas, if implemented effectively. The demand side financing strategy (DFS), on the other hand, promises to enable health service access from public and private providers by providing financial protection through health insurance, such as poor or social health insurance schemes (Hooda,2017).

## **HEALTH EXPENDITURE**

Health care expenditure is very necessary social expenditure for any country. Like any other social expenditure health expenditure also requires a significant contribution from the government. Whether it is developed country or developing country the state's role in developing a good health infrastructure and assuring good health to everybody becomes very critical and important. If there is better, efficient and equitable health system and infrastructure in the nation, it will lead to better health status in the state, improve health indicators of the state this will further improve human capital. With better health capital in the economy, productivity will improve resulting in less poverty and improvement in the economic development of the nation. Thus on the whole, if there is productive investment in health it can lead to better economic development of the nation.

## **TRENDS IN PUBLIC EXPENDITURE ON HEALTH**

Health expenditure is a very necessary social expenditure for any country. Whether it is a developing country or a developed one, developing a good health infrastructure and assuring good health to everybody becomes very critical and important. Health expenditure is an important determinant of both higher economic growth and better health status and is therefore, a key tool available to policy makers. Public health expenditure(PHE) and investment in India had increased substantially but this is not been enough to secure a minimum standard of healthcare service in the country. The various Trends in Public Expenditure on Health like Public

Expenditure on Health, Population, GDP, Per capita Public Expenditure on Health PCHE, Public Expenditure on Health PHE as percentage of GDP (per cent) are given in the following Table 1.

**TABLE 1**

**PUBLIC EXPENDITURE ON HEALTH**

<b>Year</b>	<b>PHE (Rs. in Crores)</b>	<b>Population (in Crores)</b>	<b>GDP (Rs. in Crores)</b>	<b>PCHE</b>	<b>PHE as percentage of GDP(%)</b>
	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5) =[(1)/(3)]*100</b>
<b>2009-2010</b>	72,560	117	6,477,827	621	1.12
<b>2010-2011</b>	83,101	118	7,784,115	701	1.07
<b>2011-2012</b>	96,221	120	8,832,012	802	1.09
<b>2012-2013</b>	108,236	122	9,988,540	890	1.08
<b>2013-2014</b>	131,052	123	11,345,056	1,064	1.16
<b>2014-2015</b>	159,492	125	12,653,762	1280	1.26

Source: National Health Profile, 2015

The Major trends in public health expenditure have an increasing trend. The health expenditure is 72,560 Crore in 2009-2010 where it is increased continuously and it is 159,192 crore in 2014-2015. The total GDP also increased from 6,477,827 Crore in 2009-2010 which was about 12,653,762 in 2014-2015 it was about. The per capita expenditure on health in 2009-2010 is about 1.12 per cent and it is increased in 2014-2015 as 1.26 per cent. Even though the health expenditure increased from 1.12 per cent to 1.26 per cent it was not enough because of increase in population as 117 crore in 2009-2010 to 125 crore in 2014-2015. India should concentrate on health care expenditure to improve the health status.

**PER CAPITA HEALTH EXPENDITURE**

Per Capita Public Health Expenditure is defined as the total expenditure or the sum of public and private health expenditure as a ratio of total population. Income (per capita GDP) has been identified as a very important factor for explaining differences across countries in the level and growth of total health care expenditures. Health and human development, in addition to per capita income, form an integral part of the overall socio economic development of a nation. However, compared with other developing countries, health status in India is not only below the

level of all developing countries but has also shown a lower level of improvement. Moreover, there exist very high inequalities in per capita health expenditure. Given India's size and fact that health is a state subject, it is important to examine interstate differences in spending patterns while the centrally sponsored schemes based on uniform norms, per capita expenditure in varies depending upon the prevalence of diseases and utilization of funds allocated. The per capita expenditure on health of different countries is given in the following Table 2.

**TABLE 2**

**PER CAPITA GOVERNMENT EXPENDITURE ON HEALTH**

<b>COUNTRY</b>	<b>PER CAPITA GOVERNMENT EXPENDITURE ON HEALTH (US\$)</b>
Australia	4070
Canada	3991
Germany	3846
United Kingdom	3006
Brazil	523
Turkey	470
Russian Federation	460
Colombia	405
Mexico	344
South Africa	287
Thailand	212
China	205
Ghana	60
Sri Lanka	45
Rwanda	41
Philippines	38
India	16

Source: National Health Profile, 2015

According to national health profile, 2015 the per capita government health expenditure of different countries reveals the huge differences among the selected countries. The health expenditure which is higher in developed countries like Australia it is about \$ 4070 US, Canada has about \$ 3991 US, Germany comes in the third place with \$ 3846 US, while for United Kingdom it is about \$ 3006 US and for countries like Brazil it is \$ 523 US, Turkey \$470 US, Russian Federation \$ 460 US, Mexico \$ 344 US and for South Africa it is \$ 287 US. The low per capita health expenditure of the countries like Sri Lanka is about \$ 45 US, Rwanda is \$ 41 US, Philippines is \$ 38 US. India has the lowest per capita health expenditure with \$ 16 US .

## HEALTH INDICATORS

Health indicators support provinces/territories, regional health authorities and facilities as they monitor the health of their populations and track how well their local health systems function. The health indicators in BRICS nations are given in the following Table 3.

**TABLE 3**  
**HEALTH INDICATORS IN BRICS NATIONS**

<b>Health Indicators in BRICS Nations</b>					
<b>Health Indicators</b>	<b>India</b>	<b>Brazil</b>	<b>Russia</b>	<b>China</b>	<b>South Africa</b>
GDP spending on Health care, 2012	4.0	9.3	6.3	5.4	8.8
Health expenditure, Private (% of GDP)	66.9	53.6	39.0	44.0	52.1
Health expenditure, Public (% of GDP)	33.1	46.4	61.0	56.0	47.9
Life expectancy at Birth (years, 2012)	66	74	70	75	56
IMR(per 1000 live births, 2013)	41	12	9	11	33
MMR(per 1000 live births, 2013)	190	69	24	32	140

**Source: World Bank, 2015**

The health indicators of India where the health care spending is about 4 per cent and the GDP of health expenditure of public is only 33.1 per cent which is lower compared to other countries where as private expenditure is 66.9 per cent. The life expectancy at birth is about 66 per cent, Infant Mortality Rate is about 41 per cent and Maternal Mortality Rate is about 190 per cent which is higher than other countries.

## **HEALTH INFRASTRUCTURE**

Better health is essential for overall development and happiness of any society. Provision of better health care to the people is an essential component of the state in achieving overall socioeconomic development. Health is a major component of welfare of any society. Every welfare state must accord top priority to investment in health infrastructure for two reasons. First, improved health status may increase input and efficiency of human resources and stimulates economic growth. Second, Good health may reduce communicable diseases which would save unnecessary economic expenditure achieved as a result of reduction in communicable diseases has external economies. Everyone wishes to be away from disease, disability and premature death. Good health is an important contributor to economic growth in any nation. In this background both policy makers and researchers have recognized the importance of investments in health and health infrastructure. Public spending on health and increase in incomes among the poor, seem to be the major determinants of health infrastructures, which would contribute to the better health status of the community. Such an outcome also depends on equitable sharing of provision of health services coupled with life enhancing activities like nutrition and education. Therefore, the role of Government is very important in order to achieve better health in a country (Sudha, 2015).

Health infrastructure is an important indicator for understanding the health care policy and welfare mechanism in a country. It signifies the investment priority with regards to the creation of health care facilities. Infrastructure has been described as the basic support for the delivery of public health activities. Five components of health infrastructure can be broadly classified as

- Skilled workforce
- Integrated electronic information systems
- Public health organizations
- Resources and
- Research (Kumar and Gupta, 2012).

With a population of 1.15 billion, and growing at almost 18 million per year, India will be the most populous nation by 2030, with as many as 1.4 billion or more inhabitants. Unfortunately, infrastructure development in Indian cities is paltry and requires focused attention. The double digit growth rate that the country envisions in the coming decade faces

immense infrastructural bottlenecks in cities. The larger cities attained inordinately large population sizes that have led to virtual collapse of urban services, followed by basic problems in housing, slum, water, infrastructure, quality of life, and other related aspects. Water, sanitation, sewerage, urban transport, city energy distribution, transport terminals, warehousing and logistics parks fall under the urban infrastructure category. Ancillary to the urban development is social infrastructure that includes healthcare, education, leisure and entertainment, retail, tourism, housing, exhibition and convention centers, hospitality, IT and telecom. While there had been development in certain sectors, the health sector has not received the required attention.

Urbanization has resulted in migration of people from villages to cities. This increased population in urban areas has put a strain on the health sector. Lack of infrastructure development in housing, waste management, slum rehabilitation, and drinking water has had a definite impact on the overall health index of cities. This has strained the existing resources, stressed the available healthcare infrastructure and choked the overall urban system.

Across the country, the bed to people ratio is 1:422. The existing record of Government hospitals is worse, one bed for 2,239 persons (WHO recommends a minimum of three beds per 1,000 people). Thirty five per cent of patients in private hospitals belong to lower income groups (those that earn less than Rs 10,000 a month). Eighty five per cent of these patients do not have any insurance cover, while 42 per cent visit private facilities in nearby rural areas. According to studies conducted by FICCI (2012), about 7 to 8 per cent of households are pushed below the poverty line due to expenses incurred on health care. These facts point to critical gaps in infrastructure, especially with respect to the availability of healthcare centers and well trained staff.

According to the earlier Planning Commission reports, India faces a shortage of about 6,00,000 doctors, one million nurses, 2,00,000 dental surgeons and a large number of paramedical staff. Moreover the doctor patient ratio in rural areas of India is 1:20,000, while the urban ratio is 1:2,000 against the statutory 1:250 ratio from WHO for which India requires 6,00,000 doctors (Gendral Medical Council, 2013). In India, hospitals are mostly located in metropolitan cities, and not in rural areas or emerging cities. The current strength of hospital beds is about 7 lakh and another 7 lakh needs to be added in the next 10 years. Ideally, it needs to be four beds per 1,000 people, keeping in mind the sheer geographical spread of the country and the geography's varied population density.

## **NEED FOR GOVERNMENT INTERVENTION**

Public Economics provides the theoretical base for government intervention in the provision of health care services. Governments have assumed considerable importance in the provision of certain goods and services of which health care is of significant importance. It is argued that certain health services possess the characteristics of a merit good which generate large externalities. They are also non rival and non excludable in nature. Uncertainty about occurrence of ill health and also health as a basic human right requires government intervention in provision of health care services free of cost or at subsidized prices (Gertler, 1990). Apart from the merit goods argument which stresses the need for public provision, the existence of two more sources of market failures namely, inadequate consumer information and incomplete market for health care services calls for the need for government intervention in the provision of health care goods and services in an efficient manner. Equity aspect also emerges from market failures hence, requires government intervention to provide greater accessibility and use of health facilities across different groups of the population on a wider basis and also the burden of payment to be distributed progressively across different income groups. If the collected revenues are to be efficiently and equitably distributed, it is the central government which has to perform such tasks in order to achieve a universal access to health care. An equally important aspect that goes hand in hand with the need for government financing of health care is that which categories of health care the government should finance. Public Economics also lays out the categories of health care that need to be supported by the government. It is argued that the non-patient related preventive health care should be provided by the government free of cost on account of the externality component and non-excludability characteristics of these services (Gertler, 1990). The State has been playing a major role in the provision of health for a long time. With the onset of economic reforms, the definition of the role of State has undergone a change. The neo classical economists argue that the State should play a minimal role limited to the provision of pure public goods that have spill over benefits and the delivery of other services should be unbundled to the market forces with the State being a mere overseer and financier. Under the changing scenario, with the role of the State being redefined, the core issues revolve around the aspects such as how government should intervene in the health care market for an efficient delivery of the health services. Institutional Economics provides the framework for such interventions which can be made on the basis of measurability and contestability of these goods

and services. It is argued that the government through instruments such as regulation, contracting, subsidies, financing and production can set out to the private sector, the production of inputs and outputs for those health services with a high and medium level of measurability and contestability. Services possessing low contestability and low measurability should be produced and provided by the government on account of the collective benefits involved in those services like public health interventions, training of specialized labour, knowledge generation about rare health conditions. This argument is supported by the neo classical theorists like Preker, Harding and Travis, (Kumar and Nalraj, 2014).

## **NEED FOR THE STUDY**

The concept of human capital gives emphasis on health, health education, job training, migration and other investments on human which enhance the productivity of an economy. Most of the growth economists have ignored the human capital on economic growth previously. But in this present context there are number of interests towards the research to examine the relationship in between health indicators and economic growth (Kumar, 2015).

Income which is considered to be an important determinant of economic growth has a two way relation with health. Whereas level of income determinants good health status, health status also contributes to increase in the level of income, as it is a critical factor for workforce to be productive.

Apart from income and per capita health expenditure, level of literacy also influences health. The world map of illiteracy closely coincides with the maps of poverty, mal nutrition, ill-health and high infant and child mortality rates. Studies indicate that education to some extent compensates the effects of poverty on health irrespective of availability of health facilities. (Ratcliffe Jhon, 1984)

Basic indicators of health like infant mortality rate, crude birth rate, crude death rate and literacy rate give a broad picture of health status of a country and state. They can be of use for assessing specific health care needs and also for evaluating quality of health services and programs.

As health is a global issue and has to be high on the agenda of all the countries whether rich or poor. In the Indian context, the impact of development and changes in the health sector are quite divergent and unsatisfactory, in spite of the fact that there have been voluminous

advances in health sector in India. Yet the fact remains that more than twenty percent of the Indian population still lives in abject poverty. Such a cohort of the population remains deprived of even two square meals a day does not have an access to safe drinking water, suffers from malnutrition; lives under sub human conditions; and is subjected to illiteracy. All such curses lead to infectious diseases and, therefore, to poor health. The extent of access to and utilization of health care varied substantially between states; this is to large extent is responsible for substantial differences between states in health indices of the population. Moreover, inadequate allocation of public health resources and its inequitable spread across different states have resulted in inequitable health status. Keeping these facts, a need was felt to study inter-state disparities in health status and public health expenditure in India and across its states and further to study other crucial aspects of health with respect to the major Indian states, since no such investigation appears to have been undertaken.

## **OBJECTIVES**

The objectives of the study are

- To examine the nature and level of inter-state disparities in selected Health indicators
- To analyse the trend in the growth of public health expenditure.
- To estimate the relationship between health status and public health expenditure over time and between the states
- To explore the relationship between health care expenditure and economic growth
- To suggest measures to improve health status in India.

## **HYPOTHESES OF THE STUDY**

The current study is attempted to test the following hypotheses

- There exist inter-state disparities in India in the health status, but these have declined overtime.
- The states with higher per capita health expenditure have experienced relatively better health status.

## CHAPTER II

### REVIEW OF LITERATURE

The review of literature relating to the present study on " An Overview of Health care Expenditure in India" is discussed under the following heads.

- 2.1. Health and Economic Development
- 2.2. Health Indicators and Economic Growth
- 2.3. Public Expenditure on Health
- 2.4. Health Infrastructure
- 2.5. Out of Pocket Health Expenditure
- 2.5. Other related Studies

#### 2.1. HEALTH AND ECONOMIC DEVELOPMENT

To establish the relationship between health and economic growth, it is necessary to understand the concept of health in a broad sense. Health is not only the absence of illnesses, it is also the ability of people develop to their potential during their entire lives. In that sense, health is an asset individuals possess, which has intrinsic value (being healthy is a very important source of well-being) as well as instrumental value, (Peykarjou et.al.,2011). Economic growth leads to better health, because wealth means better nutrition and increased capability to invest in health. Anyway, this relation also runs in the other direction, which means better health contributes to economic growth. Investment in health is increasingly seen as a means of achieving economic growth. Good health, which results from health investments, contributes to the achievement of economic growth through better efficiency or high labor productivity of healthy employees, reduced treatment burden, higher incentive to invest in education and training to obtain better skills, improved human capital, higher domestic saving and investment, higher rates of foreign investment and lower “dependency ratio”.

Poor health acts as a retarding factor in the path of economic development. **Schultz (1961)** realized the importance of investment in health and found the linkage between health and economic growth. He argued that the large differences in earnings between Whites’ and Blacks workings on comparable activities; between those in South and North or West, etc., are

reflections of differences in education and health. Poor health, nutrition and education lower their economic productivity which effects the growth of the country.

According to **Lalonde (1981)** good health is the backbone of the social and economic development. A nation of healthy people can do things that make life worthwhile, and as the level of health increases so does the potential of happiness. Good physical and mental health is necessary for the quality of life which everyone enjoys. According to him improvements in health depends upon health care system, standard of living, proper sanitation measures for protecting public health and advances in medical science.

**Pritchett and Summers (1996)** suggested that the link between health and wealth is not only co relational but also causal. They found a statistically significant impact of income (over time and between countries) even whilst holding other relevant factors constant and also they identified variables known to determine growth but not health (e.g. global terms of trade) and found they still correlated with infant mortality. The causal factors for growth also seem to raise health, then this can be seen as evidence that causation also goes from growth to health. This is given some practical relevance by Ingram's analysis, which demonstrates that GDP is related to the health inputs of doctors ( $R^2 = 0.76$ ) and daily caloric intake ( $R^2 = 0.69$ ). This begins to draw a picture of the many causal ways that growth may in practice raise health through purchasing public and private goods (Ingram, 1992).

**Schultz (1999)** stated that health leads to increase in individual income as well aggregate income. From individual point of view health and nutrition has the possibility of increasing a child's capacity to learn in school and finally source of non-earned income. From macroeconomic studies also he confirmed the view that period of sustained growth in national output per unit of input is closely associated with the periods when improvement have occurred in a population's nutrition and health.

**Bloom et.al., (2004)** examined that improving health increases economic growth. One-third of annual growth in GDP can be attributed to health capital, and an increase in life expectancy of one year is associated with an increase in the long run growth rate of up to 4 percentage points in both developing and developed countries.

**Shultz (2005)** examined the various household indicators of adult nutrition and health, the study found out positive impact of health on total factor productivity. The study resulted that healthy people had significant and positive effect on productivity and wages. The study inferred

third world countries have shortage of resources for investment in health while poor health status slowed down the acceleration of economic growth.

**Malik (2006)** examined health status by infant mortality rate, life expectancy rate, crude health rate and per capita GNI (Gross National Income) as indicators of economic growth. He concludes that if OLS (Ordinary Least Square) is used then there is no significant relationship between health status and economic growth, but using 2SLS (Two Stage Least Squares) the study finds highly significant effect of health indicators of economic growth.

**Akram et.al., (2009)** investigated the impacts of different health indicators on Economic growth in Pakistan. The Co integration, Error Correction and Granger Causality techniques were applied on the time series data of Pakistan for the period of 1972-2006. The study found out Per capita GDP is positively influenced by health indicators in the long run and health indicators cause the per capita GDP. However, in the short run the health indicators fails to put significant impact on per capita GDP. It revealed that health indicators have a long run impact on economic growth. It suggests that impact of health is only a long run phenomenon and in the short run there is no significant relationship exists between health variables and economic growth. The major policy implication of the study is that if they desire a high levels of per capita income, they can achieve it by increasing and improving the stock of health human capital, especially if current stocks are at lower end. Moreover, study also points out a rather diminutive role of public health expenditure in determining the per capita GDP.

**Aghion et.al., (2010)** examined the relationship between health and growth in light of modern endogenous growth theory. The study proposed a unified framework that encompasses the growth effects of both the rate of improvement of health and the level of health. Based on cross-country regressions over the period 1960 to 2000, they found that a higher initial level and a higher rate of improvement in life expectancy both have a significantly positive impact on per capita GDP growth. Then, restricting attention to OECD countries, the study found to supporting evidence that only the reduction in mortality below age forty generates productivity gains, which in turn may explain why the positive correlation between health and growth in cross OECD country regressions appears to have weakened since 1960.

Health is one of the most important components of human capital. It can affect production level of a country through various channels. **Liya (2011)** examined the causal relationship of health and real GDP per capita income in 5 low income countries of Africa south

of the Sahara is analyzed using granger causality test. Unbalanced panel data set during the year 1970 to 2009 is used. Life expectancy and mortality rate are used as a proxy for health. The result revealed that mortality rate has a significant and negative impact on real per capita income. The Granger causality test showed, real GDP per capita and mortality rate have causal or bidirectional relationship. On the other hand, real GDP per capita does not granger cause life expectancy, but life expectancy granger cause real GDP per capita. The comparative descriptive analysis of the health indicators in different income groups of the world also showed that, higher income countries are better off in their health status.

Health is a very essential component of human development because healthy workers are more productive. Using the conventional growth accounting method **Sanjoy (2012)** estimated the aggregate TFP growth for the Indian economy. He examined the impact of health on TFP growth for the Indian economy. The study observed that TFP growth in India has been fluctuating in nature. Granger Causality tests show that there is a one way relationship between health as captured by life expectancy at birth and TFP growth for Indian economy. The regression analysis revealed that there is an improvement of health condition as measured by life expectancy at birth in India affects TFP growth has positive and significant relationship. Therefore, the study suggested that government should invest more to deliver better health care facilities which would further help in enhancing the productivity of the economy.

**Adonia (2013)** intended to analyse the relationship between health and economic growth and to assess whether the two actually effectuate each other justifying further the rising expenditure. The relationship was examined for Malta where the granger causality test was used to determine the direction of causality. Four variables were incorporated into the model so as to exploit all possibilities of causality, for the period 2000 to 2012. Economic growth was captured by using seasonally adjusted and not seasonally adjusted GDP. On the other hand, health was represented by total health expenditure and by another variable HENM (where capital construction costs incurred between 2000 and 2009 to build the new hospital were deducted from total health expenditure). The model was also run for different period sets: 2000 to 2012, 2000 to 2006 and 2007 to 2012. The study found that causality does not run either way and that economic growth and health expenditure are independent. This means that increased investment in health through health expenditure will not trigger increased economic development and as the economy develops it does not bring about higher expenditure on health.

There are number of theories on the relationship between government expenditure and economic development the two approaches, viz., the Wagnerian and Keynesian approaches have received more attention. **Kumar and Nalraj (2014)** examined the casual relationship between health care expenditure and economic growth on the four states based on an annual data series from the period 1991 to 2010. The necessary information collected from various sources was analyzed. It is confirmed that the health expenditure and economic growth are co-integrated in all the four Indian states. Hence, these results revealed that there exists a unidirectional causality from health expenditure to economic growth in all four states.

Health plays a vital role in making an individual and society productive, efficient and optimal. **Mahesha et.al., (2015)** analysed the positive correlation between health and development, both social and economic. The Constitution of India places the responsibility of health of the citizens in the hands of the 'State' in Indian federal system. The study found that although there is increase in total spending on public health expenditure it is less than much needed amount. Further, the proportion of health expenditure to GSDP is very dismal and lower than required. Moreover, GSDP influences health expenditure of Karnataka.

**Malick (2015)** examined whether there is a long run relationship between public expenditure on health and productivity or not. The study attempted to investigate the causality in between the health indicators and per capita GDP (which is a proxy for economic growth) by using co-integration and Granger Causality for the time period 1960 to 2008 and also between public health expenditure whether expenditure on health is an impetus input to economic growth or not. It has been showed that there exists a significant and two way relationships between expenditure on health and economic growth in India as well as between other health indicators and economic growth. The study suggested that more long run expenditure on health and to introduce an effective national level health policy for India which could enhance economic growth in long run is the need of the hour. High health expenditure is a necessary criterion to raise productivity of an economy in long run, and also to ensure minimum level of health and health education as a fundamental right in India. The study may contribute to the deeper understanding of the benefits of investing on health. The study may provide a significant insight in to the policy making in India.

**Frasholli and Hysa (2015)** analyzed the processes and connections that trigger the relationship between investment in health and the achievement of economic growth. The study

analysed the effects that health investment has on economic growth and the economic rationale for investing in health. The study found out how better health serves as a predictor of economic growth and the degree to which economic growth is explained by health expenditures in South Eastern European countries. Regression analysis, used in identifying the relation between health expenditure per capita and GDP per capita for SEE countries are based in the data of World Bank for years 2000 to 2011. The study also found out there exist a strong relationship between investment in health and economic growth in all SEE countries. By comparing the regression's results of the SEE countries, it could be concluded that health expenditures per capita in Albania, as a measure of investing in health, explain slightly more of the variation in GDP per capita than in the other countries. On the other hand, Macedonia and Albania are the countries where health expenditure had the highest impact on economic growth.

Health expenditure is vital as it increases labor productivity which further induces growth and development. Health care expenses in BRICS countries are not only inadequate and access to them varies across countries which are mainly influenced by the socioeconomic conditions as well as by the health policies in place. **Arun and Kumar (2016)** analyzed the per capita public health expenditure of BRICS countries in relation to exogenous explanatory variables. The study used panel data of five countries from 1995 to 2013. Data for the per capita public health expenditure, per capita GDP, and the other six variables are obtained from the World Bank. Hausman test is fixed effect panel data regression model to determine the effects of public health expenditure on health outcomes. The results indicate per capita GDP, death rate, life expectancy at birth, and infant mortality rate under five were significantly contributing to the increase in the per capita public health expenditure. Variables such as infant mortality rate and percent of population above 65 years show negative correlation with that of per capita public health expenditure. The findings imply that public health expenditure plays a crucial role in providing better health care to people in BRICS countries.

**Nadide et.al., (2016)** examined the relationship between health expenditure and economic growth using panel data consisting low and high-income countries. Using dynamic panel data methodology, the study analysed twenty five high-income and nineteen low-income economies for the periods of 1995 to 2012 and 1997 to 2009, respectively. The study found that reciprocal relationship between health expenditure and economic growth in the short run and one way causality from economic growth to public health expenditure in the long run. In

high income countries, there is a two way causality for both private and public health expenditures in the short-run, while in the long run there is a one-way causality between economic growth and private health expenditures. The study found out the private health expenditures have negative influence on economic growth while public health expenditures have both negative and statistically significant effect.

**Bedir (2016)** examined the relationship between income and health expenditures. Although there are differences in the economic structure and health expenditures of the countries in the panel, there is a tendency for an increase in both per capita gross domestic product and health expenditures for all. Therefore, a modified version of the Granger (1969) causality test proposed by Toda and Yamamoto (1995), and Dolado and Lütkepohl (1996) was used in emerging markets in Europe and Middle East African and Asian countries over the period from 1995 to 2013. According to the analysis, two way causality was found for the Czech Republic and Russian Federation. The evidence from the Egypt, Hungary, Korean Republic, South Africa, and the Philippines supports the health view over the income view, while the evidence from Greece, Poland, the United Arab Emirates, China, Indonesia, and the Korean Republic supports the income view over the health view. The empirical results have indicated that income is an important factor in explaining the difference in healthcare expenditures among countries. Therefore, it appears that increases in income level stimulate healthcare expenditures for some of the emerging market economies.

**Fatima et.al., (2016)** investigated the causality and co-integration relationships between public spending on health and economic growth in Algeria during 1974-2014 using annual data. The study concentrated on time series co-integration and causality in ECM framework. The findings revealed that there is a long-run causality from public spending on health to economic growth while it is not observed any short-run causality from public spending on health to economic growth. The lack of strong link from public spending on health to economic growth is not necessarily a reason to reallocate health investment away from the health sector. The improvements in health status will be worth the effort even if they turn out to have little effect on growth.

Health can actually drive or lead to economic growth. Good health is important both at individual and economic context. At the individual context, good health is a determinant of economic productivity. At the economic context, it is a determinant of human capital, which

positively affects productivity and economic growth. As the review of the literature indicated, the impact of health in economic growth is extensively analyzed by many authors and there is a general agreement among them that better health effects positively the economic growth of a country.

## **2.2. HEALTH INDICATORS AND ECONOMIC DEVELOPMENT**

Health is an indicator of economic development. Health expenditures, sex ratio, literacy rate and infant mortality rate have been used as health indicators. The issues in health sectors directly or indirectly strike on economic growth.

Maternal education has a strong impact on infant and child mortality. On average each one-year increment in mother's education corresponds with a 7 to 9 per cent decline in under 5s' mortality. Education exercises a stronger influence in early and later childhood than in infancy **Cleland et.al., (1988)**.

**Bhargav (2001)** points out a positive relationship between adult survival rate and economic growth. He has mentioned that the fertility rate is replaced by life expectancy. He has mentioned that the fertility rate have a negative relationship with economic growth. To him that life expectancy is extremely influenced by the child mortality. Growth in work force is mostly lower than population growth. High fertility growth reduces the economic growth by putting extra burden in scarce resources.

It is estimated that, although the mortality of females relative to that of males in India has improved since 1968, the population sex ratio increased between 1971 and 1981 stayed constant between 1981 and 1991 and started to decrease only after 1991. This implies that the recorded decrease and increase in the periods 1971 to 81 and 1981 to 91 respectively were both spurious and were the results of undercounts of females in 1971 and 1991, **Michel (2002)**.

**Emanuele (2003)** used data for a sample of developing countries and transition economies. This study estimated the relationship between government spending on health care and education and selected social indicators. Unlike previous studies, where social indicators are used as proxies for the unobservable health and education status of the population. The study found to suggest that public spending is an important determinant of social outcomes, particularly in the education sector. Overall, the latent variable approach yields a better social production function than the traditional approach, with higher elasticities of social indicators

with respect to income and spending, therefore providing stronger evidence that increases in public spending do have a positive impact on social outcomes.

Bloom et.al., (2004) estimated a production function model of aggregate economic growth including two variables that micro economists have identified as fundamental components of human capital work experience and health. The study resulted that good health had a positive, sizable and statistically significant effect on aggregate output even when they control for experience of the workforce. They argued that the life expectancy effect in growth regressions appears to be a real labor productivity effect and is not the result of life expectancy acting as a proxy for worker experience.

**Mathur et.al., (2004)** analysed the relationship between livelihoods and childhood poverty and well-being in the State of Rajasthan and found that the practice of female infanticide, female foeticide and strong son preference in most communities were the factors contributing to the imbalance in the sex ratio in Rajasthan, which is also indicative of the low value and secondary status of the girl child.

Female foeticide was cited as the main reason for the decline in sex ratio. The other reasons included neglect of the girl child resulting in higher female mortality, maternal death, dowry death, female infanticide and male migration (**Ghosh, Goel and Balda 2005**).

**David (2006)** examined the application of scientific advance and technical progress (some of which is induced by income and facilitated by education) as the ultimate determinant of health. The study used both time-series and the cross-section data and found that there is a strong correlation between income per capita and mortality rates, a correlation that also exists within countries, where richer, better-educated people live longer.

**Malhotra and Shweta (2006)** attempted a study on public health expenditure in various states and analyzed the extent to which state is fulfilling its responsibility in providing public health facilities. They used Regression for analysing the relation between per capita health expenditure and level of economic development as measured by per capita Net State Domestic Product (NSDP) in various states. They also analyzed the relations between major indicators of health viz; crude birth rate (CBR), crude death rate (CDR), infant mortality rate (IMR), expected life for male (ELM), expected life for female, and their major determinants viz, per capita net state domestic product (PCNSDP), per capita health expenditure (PCHE) and literacy rate (LR). The results of inter-state disparities in case of health indicators showed that the basic health

indicators in various states have improved over time but still are far behind many developed countries. The results of relationship between health indicators and per capita health expenditure (PCHE) showed that Infant Mortality Rate (IMR), Crude Death Rate (CDR) and Crude Birth Rate (CBR) has significant and negative relationship with per capita health expenditure. Similarly, life expectancy both for males and females are highly significant and have positive relationship with per capita state health expenditure. Values of  $R^2$  are relatively low because health is also affected by factors other than per capita health expenditure like gender empowerment, poverty, education, adequate housing, clean drinking water and sanitation etc.

**Jamison (2007)** assessed whether the mechanism by which education quality appears to improve per capita income levels through shifting the level of the production function, through increasing the impact of an additional year of education, or through increasing a country's rate of technological progress. Mortality rates complement income levels as indicators of national well being, and improved education quality increases the rate of decline in infant mortality. In the analysis of growth, the study found a stronger impact of education quality and of years of schooling in open than in closed economies.

**Shruti (2010)** examined the correlation of infant mortality in India using district level data from the 1991 and 2001 Census of India. While infant mortality rates have dropped across districts over this ten year period, there still remains a lot of heterogeneity across districts and hence across the states. Using a panel dataset of 666 districts, the analysis seeks to determine which of socio and or economic factors play an important role in reducing infant mortality rates. The study used quartile regression analysis to determine which of these factors impact infant mortality. The analysis brings out the powerful influence of women's characteristics on infant mortality, especially literacy and labor force participation. Increases in both of these variables significantly reduce child mortality at the district level. Improvements in male laborers in non-agricultural work and reductions in poverty also reduce child mortality, but their quantitative impact is weak in comparison. The covariates is strongest in the districts which lie in the center of the conditional distribution, rather than those at the extreme. The analysis allows us to determine in which districts the impact of additional target policies would yield the greatest reduction in infant mortality.

**Strittmatter and Sunde (2011)** investigated the causal effect of changes in health on economic development using a long panel of European countries. The public health care systems

in different countries, which is the random outcome of a political process. The study documented that the introduction of public health care systems had a significant immediate effect on the dynamics of infant mortality and crude death rates. The study found that a reduction in infant mortality or crude death rates exhibited a positive effect on growth in income per capita and increased population growth.

**Chahal and Bala (2012)** examined three significant components of service brand equity i.e. perceived service quality, brand loyalty and brand image and analysed relationships among the components of brand equity and also their relationship with brand equity, which is still to be theorized and developed in the healthcare literature. Effective responses were received from 206 respondents, selected conveniently from the localities of Jammu city. They analyzed using factor analysis, correlations, t-tests, multiple regression analysis and path modeling using SEM. The findings of the study support that service brand equity in the healthcare sector is greatly influenced by brand loyalty and perceived quality. However, brand image has an indirect effect on service brand equity through brand loyalty (mediating variable). The study establishes a direct and significant relationship between service brand equity and its two components, i.e. perceived service quality and brand loyalty in the healthcare sector. It also provides directions to healthcare service providers in creating, enhancing, and maintaining service brand equity through service quality and brand loyalty, to sustain competitive advantage.

Using panel data analysis techniques, this study investigated empirically the relationship between economic growth and infant mortality that is one of the basis variables of health sector over the period 1970-2007 for a sample of 25 high income OECD countries. **Erdogan et.al., (2013)** found out the empirical evidence reveals that there is a significant and negative relationship between infant mortality rate and real per capita GDP in selected countries. The infant mortality rate of the countries decreased as countries became rich and powerful and new levels of strategic thinking, which will find innovative solutions, have an important role in decreasing infant mortality rate and growing economic power of the countries.

**Raza (2013)** investigated the issues of health sector in Pakistan and highlighted the important link between health indicators and economic growth. For this purpose, Ordinary least square method and Granger Causality technique are applied on time series data of Pakistan from 1980-2012. Health expenditures, fertility rate, life expectancy and infant mortality rate have been

used as health indicators. The study is to enhance those issues in health sectors that directly or indirectly strike on economic growth of Pakistan so that effective policies can be chalked out to cope current as well future condition regarding health and an economic growth. The results showed that life expectancy, fertility rate, investment on health sectors has significantly influenced the per capita GDP. Health expenditures have also positive but insignificant impact on economic growth. Whereas there is negative relationship of infant mortality rate, population per bed on economic growth. The major policy implication of the study is that by increasing the health facilities through increase in investment on health sector that will improve the sustainable level of economic growth.

Rapid decline in child sex ratio (CSR) is a serious problem with severe socio-economic, demographic and cultural implication. **Singariya (2013)** by using the Ordinary Least Square (OLS) method and Quantile Regression estimates for thirty five states and union territories of India, examined the determinants of child sex ratio. The results showed that the female literacy rate has significant positive while male literacy and percentage share of the urban population have a significant negative association with child sex ratio in India. Decadal population growth rate has a significant positive association with rural child sex ratios but insignificant negative associated with urban child sex ratio. The study also highlighted the regional variations through dummy variables. Coefficients of child sex ratio with regional dummy variables show that north west region has highest negative and southern region has a highest positive influence on juvenile sex ratio of India. Thus strengthening of female education and reduction in higher usage of sex determination tests and infant mortality rate is an utmost need for balancing child sex ratio in north and northwest region of India.

**Jabir and Falak (2013)** aimed to analyse the state wise educational status of Muslims in India and also to compare the educational status of muslims with the educational status of other religious communities in India. The country level and state level published data have been obtained from census of India. At the same time the association between the educational status of muslims is sought with their socio-economic development. The results have revealed that the educational status of Muslims in India is not satisfactory and needs special attention. They found that more than half i.e., 53.95 per cent of the total population of the Muslims in India is illiterate with 17.48 per cent literate people just for name sake only. Technical education or higher education is meager among the muslims. They found that Muslims who accounts for 13.46 per

cent of the total population of the nation show lowest literacy rate, lowest percentage of higher education and lowest degree of female education. The percentage of higher education, sex ratio and female literacy rate is also highest in this religious community.

**Sada et.al., (2013)** reported determinants of infant mortality while examining possible changes in results under traditional regression analysis that ignores hierarchical structure of data. They reported that the community level characteristics still have a major role regarding infant mortality in India. For better epidemiological understanding, the authors tried to assess determinants of infant mortality in rural India, where three level considerations were possible. The results indicate that even after consideration of these covariates, variation in infant mortality remains significant not only between States but also between Districts. Further, as an additional observation, the probability of infant mortality is still high in rural areas of districts having health facility beyond three kilometers than their counterparts.

**Khan and Banerji (2014)** overviewed the Indian health care sector and the rising demand of health care sector in India. The study evolved the concept of globalization, development of information technology, medical tourism, role of urbanization, growth of health care insurance sector, affordability of health care in India and the role played by major private health care firms in India. Descriptive design were used for the study. Secondary data is collected from different health care surveys in India, health care websites, journals, newspapers, health magazines and conferences. They found with rising health care demand in India, private sector hospitals and health care firms started to come with the concept of Corporate Social Responsibility (CSR) by giving subsidized rates and rural coverage concepts in India, so that the poor people can afford for the necessary treatment as 32.7 per cent of the total Indian people fall below the international poverty line of US\$ 1.25 per day (PPP) while 68.7 per cent live on less than US\$ 2 per day.

**Ronjoy et.al., (2014)** found the infant mortality rate in Amdanga block is determined the various causes associated with infant mortality. It is a retrospective record based study. Data on infant death were collected from government health records maintained at Amdanga Block Primary Health Centre, North 24 Parganas, West Bengal for the period of 5 years (2008-2012). The infant mortality rate over this period was 17.8 per 1000 live births. Majority of death occurred in the neonatal period (83.6 per cent). The main causes of neonatal deaths were low birth weight including prematurity (30.9 per cent), birth asphyxia (19.3 per cent), whereas the

most common cause of post-neonatal death was acute respiratory tract infection (34.7 per cent). Most of the infant deaths are preventable through improved antenatal and perinatal care and strengthening of referral system.

Sex ratio is defined as the number of females per 1,000 male population. **Dawn and Basu, (2015)** did a study on sex ratio, the demographic scenario of any nation. The prime importance is to understand the population structure and its peculiarities within any territorial area. According to Census of India, the general sex ratio in India in 2001 was 933 which have experienced an upward trend up to 940 in 2011. They attempted to analyze the causes of such imbalances as well as to investigate the nature of regional disparities and its impact of such disequilibrium upon society. On the contrary, child sex ratio in the country has experienced a declining trend from 927 in 2001 to 919 in 2011. The State of West Bengal has experienced a positive increase in general sex ratio from 934 (2001) to 950 (2011) while the child sex ratio has declined from 960 (2001) to 955 (2011).

Over all sex ratio (OSR) in India has enlarged from the last census (2001) by seven points from 933 to 940, the situation is worse for the child sex ratio (CSR). According to the decadal Indian census, the sex ratio in the 0 to 6 age group went down from 962 girls per 1000 boys in 1981, to 914 girls per 1000 boys in 2011. 2011 census showed that in 26 States/UTs rural child sex ratio are higher than urban areas. **Paul and Saha (2016)** intended to explain variability of CSR across the country through superimposed socio cultural frame. The analysis is based on CSR provided by Census of India for various decades. The study has focused on various factors covering wide range of socio economic and demographic dimension that can be associated with contemporary sex discrimination and clarified their relative explanatory power. The spatial dimension of discrimination obtainable above leads to conclusions that sex ratio is more skewed in the most urbanized and economically well off states of north and western region.

The social and economic benefits of education especially female literacy is considered a bet in improving the health and basic child care. **Ripudaman (2016)** attempted to determine the spatial patterns of female literacy and economic development in India. Higher female literacy rate districts are noted for lower proportions of poor populations. Analysis of district level data of India for female literacy rates and asset less population confirms a spatial correspondence with each other. He found that the majority of districts with more than 50 percent female literacy rates

are noted for below national average asset less populations. This spatial correspondence between female literacy and asset less populations represents an inverse correlation.

**Ziba (2016)** aimed to understand the effect of economic growth on health and 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 carried out in four periods (1992-93, 1998-99, 2005-06 and 2010-11) in 25 states of India. The data has been used from different sources. The study observed that GDP has increased since 1992-93 and in the period 1997-98 to 2005-06 there was a high rate of increase level. Immunization has not increased fast in all the periods, also IMR and UFMR have decreased slowly over time. The results shows that the effect of female literacy on health (via IMR, UFMR and Immunization) is much important than income. He concluded that the role of female literacy is without doubt more important on the health system. The study showed 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.

**Suriyakala et.al., (2016)** overviewed to identify the factors that affect the infant mortality rates would help in better targeting of the programs leading to enhanced efficiency of such programs. The study used the data from Indiastat.com from all states and Union Territories of India for the years 2001 and 2011 tried to establish the relationship between infant mortality rate and some of the above mentioned factors along with a few healthcare infrastructure related variables. The study used the regression analysis method not only identify the influence of the variables on infant mortality and also further to identify the performance of states and union territories in reducing IMR. The performance was measured using ‘technical efficiency’ analysis. The study compared the performance and growth rate of IMR to classify the states as good performers and laggards. Their results suggested that most of the major states are on track on their performance on IMR. However, a few small states and union territories like Andaman and Nicobar Island, Mizoram, Arunachal Pradesh as well as Jammu and Kashmir need special attention and targeting to reduce IMR.

**Krishna et.al., (2016)** discussed Infant mortality rate as an excellent indicator of the socio-economic development of a country. India is facing severe problems related to the infant mortality. The statistics revealed that neonatal death rate is the highest in the world (43 per 1000 live births). A quarter of world's neonatal deaths (one million) each year take place in India, mostly at home (65.4 per cent of all births and 75.3 per cent of births in rural areas occur at home). It may be noted that despite the great importance of the subject, no information is available regarding the details of the causes of deaths. Infant mortality is a major health problem and government is more concerned towards solving such health problem by reducing infant mortality rate. Further, the reasons for infant mortality include socio cultural beliefs, education of mother, regular health check-up, lack of proper health care facilities, etc. The study concluded that infant mortality is the result of socio economic characteristics of mothers and households, demographic characteristics of children, and health care behaviour of mothers, availability of health care facilities, etc.,.

The 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.

### **2.3. PUBLIC EXPENDITURE ON HEALTH**

Health expenditure is the total expenditure in an economy by both government and private citizens on health related matters. It usually includes expenditure on health care. For improved Health care investment on education, housing, old age security and other social provisions is essential. Effective contribution and the active participation of the government are essential. Even in the most advanced countries, the role of the government has been extremely critical in assuring that health care becomes universally and more or less equitable. Investment in health care is a necessary social investment without which the large mass of working classes cannot realize good health and contribution to the economy.

**Kleiman (1974)** reached the conclusion that if the income elasticity of medical care expenditures across countries exceeds one then the countries with high expenditure, the marginal unit of medical care is more likely to produce improvements in so called subjective components

of health, such as relief of anxiety and more accurate diagnoses, rather than improvements in morbidity and mortality rates.

**Newhouse (1977)** work, examined the degree to which this discrepancy in health expenditure is explained by income of a country. The focus was to examine the magnitude of income elasticity of health expenditure. Health is described a luxury good if the responsiveness is sensitive to income change (i.e., if elasticity  $>1$ ) and as a necessary good if the responsiveness is insensitive to income change (i.e. if elasticity  $<1$ ).

**Bac and Le Pen (2002)** argues that there is not only a strong positive correlation between per capita health expenditure and per capita income in developed countries, but also that per capita income explains a high percentage of the variation in per capita health expenditure. They questioned whether the income elasticity of health expenditure is greater or less than 1. If the elasticity is higher than 1, national health expenditure would increase faster than income, while if it is less than 1, health expenditure would increase more slowly than income. In summary, the empirical literature on the determinants of national health expenditure shows that aggregate income is one of the most important factors in explaining health expenditure.

**Gupta et.al., (2003)** explained the use of King's methodology (1997) and demographic and health survey (DHS) data from 70 developing and transition economies, to extend Bidani and Ravalli's approach, finding similar results. The results suggested the public spending on health may have different effects on the health of people of different socio-economic status (SES), due to differing level of needs and ability to substitute private spending for public spending.

**Schefflen (2004)** stated that health should not be treated as life expectancy, infant mortality rate, adult survival rate but it should be treated as health expenditure. He has stated that elasticity of health care spending with respect to GDP is greater than one. This implies if GDP increases by 2 percent then the health care spending is somehow more than 2 percent. The study analyzed the relationship between income and health expenditure belong to the developed countries. In India, the longitudinal study on the relationship between health, income and health expenditure is very few. Using time series data set from 1974-75 to 1990-91 across the 15 major states in India, Reddy and Selvaraju (1994) have found that there is a strong relationship between per capita health expenditure (public) and per capita income and that health care expenditure is elastic to changes in income. One can raise the validity of the regression results obtained by

Reddy and Selvaraju (Wooldridge, 2000) development in time series econometrics suggested that if two series are non stationary, then OLS regression can yield spurious result.

**Kaushik (2006)** stated the relationship between health status, expenditure on health and education and per capita income in respect to the state of Himachal Pradesh, using the data for the period 1971-2001. The study used Johansen's methodology to test the existence and uniqueness of co-integrating vectors among the different variables. Their results suggested that the health expenditure health status relationship is different from the health expenditure income relationship, there is a lack of causality in the latter relationship. They further observed that causality that flowed from per capita expenditure on education to infant mortality rate is stronger than the impact of real per capita income on health status.

**Haldar and Sushil (2008)** viewed range of variation of income, health expenditure, and health status across the 15 large states in India. The empirical validity of the theoretical model on income, health, and healthcare relationships is examined in India's 15 large states considering a longitudinal data for 26 years (from 1980-81 to 2005-06). Causality is examined between socio-economic status of health, income and health expenditure using Granger Causality tool. The results vary across the states. They found that the impact of health on income, health and health expenditure, and health expenditure and income are examined in the light of bivariate Granger causality tool. The analysis of the degree of interconnections is expected to contribute to a deeper understanding of the benefits of investing in health. The study analysis may be significant for economic policymaking and may help contribute to socioeconomic development plan at the disaggregate level in India.

**Murthy and Okunade (2009)** examined the major determinant of health care expenditure in African countries. They used ordinary least square (OLS) and two-stage least square (TSLS) method by employing cross-sectional data for the year 2001. The study concluded that there are two major determinants namely per capita real GDP and per capita real foreign aid (FA). In general, studies on the determinants of health care expenditure discussed above employed different methods and types of data. Somehow a number of variables were included, such as age of the population, public health care expenditure and relative price of health care. Per capita income is found to be the major determinant of health care expenditure.

**Lien (2009)** examined the relationship between income and the municipal tax rate, while investigating the determinants of per capita total health expenditure in Finland. Two way fixed

effects models were estimated applying a simple two stage estimation procedure to municipality level panel data (N = 415) for the period 1993-2004. The determinants of per capita total health expenditure were the proportion of elderly, the rate of disability pensions, the employment-to-population ratio, the municipal tax rate, the state reimbursements of prescription medicines and private dental care, income, and population density. The hospital districts were statistically significantly associated with health expenditure. Both measures of income elasticity were small (0.045 and 0.020), implying that public health care is a major necessity good. The study found suggested that the high use of prescription medicines has resulted from increased population morbidity and that local tax rates have been used as a method of financing local services.

**Xu et.al., (2011)** points out that health expenditure has become a great concern for both households and governments. They used panel data from 143 countries over 14 years, from 1995 to 2008 to both standard fixed effects and dynamic models to explore the factors associated with the growth of total health expenditure as well as its main components namely, government health expenditure and out-of-pocket payments. The study showed great variation across countries in health expenditure as a share of GDP, which ranges from less than 5per cent to 15per cent. Apart from income many factors contribute to this variation, ranging from demographic factors to health system characteristics. The study suggested that health expenditure in general does not grow faster than GDP after taking other factors into consideration. Income elasticity is between 0.75 and 0.95 in the fixed effect model while, it is much smaller in the dynamic model. They found there is no difference in health expenditure between tax-based and insurance based health financing mechanisms. The study also confirmed the existence of fungibility, where external aid for health reduces government health spending from domestic sources. However, the decrease is much small than a dollar to dollar substitution. The study also finds that government health expenditure and out of pocket payments follow different paths and that the pace of health expenditure growth is different for countries at different levels of economic development..

**Hussain and Suresh (2012)** attempted to analyze the determinants of public expenditure in Assam in both pre economic and post economic reform period. The analysis revealed that in the pre economic reform period, the net state domestic product, per capita net state domestic product and total receipts to net state domestic product were the driving force behind the growth of public expenditure thus proving Wagner's law of increasing expenditures with increasing state activities. The study also proved that the increase in total receipts have contributed to the

increase in State expenditures. On the other hand, in the post economic reform period covering the period of their study shows that the variables per capita revenue expenditure(PCRE), per capita capital expenditure (PCCE), percentage of urban population to total population (PCUPOP), per capita net state domestic product (PCNSDP), per capita revenue expenditures on general services (PCREGS), per capita revenue expenditures on economic services (PCREES), net state domestic product (NSDP), per capita capital expenditures on social services (PCESS), literacy rate (LR) and dummy variable have been the main factors determining the growth of public expenditures in Assam. The consumer price index in both the periods has been an insignificant variable in determining public expenditure in Assam.

**Mehrara et.al., (2012)** examined the stationary and co integration between the health expenditure and GDP based on the panel co integration analysis, for a sample of 13 Middle East North Africa (MENA) countries using data for the period 1995-2005. Panel unit root tests results indicated that both health expenditure and GDP are non- stationary. Even though, they found that health expenditure and GDP are co integrated. They concluded that the share of health expenditures to GDP decreases with GDP. This implies that health care is not a luxury good in MENA countries.

**Ebru (2012)** examined the relationship between health expenditures and sustainable development within economic and health indicators. In this study gross domestic product (per capita GDP), the basic health indicators infant mortality rate, life expectancy at birth and other health indicators were used. Turkey's health expenditures and other development indicators related to the study are compared among advanced countries.

**Fumitaka (2012)** used panel data which are the determinants of health care expenditure in twelve Asian countries (i.e. Cambodia, China, Indonesia, Japan, Laos, Malaysia, Mongolia, the Philippines, South Korea, Singapore, Thailand and Vietnam) for the period of 1995-2008. The empirical results indicated that only two independent variables (GDP and POP) have significant relationship with health care expenditure in these countries. These two variables are positively correlated with the amount of health care expenditure. In other words, when the countries' income is larger, the amount of health care expenditure is larger. When the share of ageing population in the total population is higher, again the amount of health care expenditure is larger.

If people are a country's principal asset, then their health status defines the course of development and their health characteristics determine the nature and direction of sustainable human development. With this background **Agri Eneji et.al.,(2013)** explored the relationship between healthcare expenditure, the health status and national productivity in Nigeria. Since the public and private health care sectors are broad, they focused on the public healthcare expenditure from 1999-2012. Public health care expenditure is considered as the explanatory variable for health status, productivity and poverty reduction. However, the causal relationship is weak in the Nigeria scenario. The study recommended a universal healthcare coverage; a system that everyone can access healthcare. More so, in an increasingly globalized world, it is recognized that high levels of investment in research and innovation are essential, both for economic competitiveness and to yield innovation in areas such as healthcare and environmental technologies. These make tangible improvements to quality of life.

There has been an increase in healthcare expenditures while at the same time the inequity in distribution of resources has grown. **Samadi and Rad (2013)** used Panel data econometrics methods long term analysis on Pesaran cross sectional dependency test followed by panel unit root tests to show first whether the variables were stationary or not. A long term relationship was found between the health expenditures per capita and GDP per capita, the proportion of population below 15 and above 65 years old, number of physicians and urbanisation. Besides, all the variables had short term relationships with health expenditures, except for the proportion of population above 65 years old. The coefficient of GDP was below 1 in the model. Therefore, health is counted as a necessary good in and governments must pay due attention to the equal distribution of health services in all regions of the country.

**Ismaila and Mohammed (2013)** empirically examined the determinants of public health expenditure in Nigeria. The study used the error correction techniques and time series data from 1986 to 2010 to evaluate the factors that influence public health expenditure in Nigeria, the results showed that demand for health in Nigeria is price inelastic. It also showed that that total population of 14 Years of Age and Younger and health expenditure share in gross domestic product (proxy for government developmental policy on health) are the major determinants of health expenditure in Nigeria while gross domestic product per capital, unemployment rate, Population per Physician, consumer price index and political instability are insignificant.

**Micheal et.al., (2014)** examined the determinants of public healthcare expenditure in Ghana using annual time series data from 1970 to 2008. The study explored the stationarity and co integration properties between public healthcare expenditure, and environmental and socio-economic indicators using ERS optimal point unit root test, and Engle-Granger co integration tests. They examined the long-run impacts of real GDP, CO2 emissions, crude birth rate, life expectancy, inflation and urbanization on public healthcare expenditure in Ghana. The results of the study showed that public health expenditure in Ghana is positively affected by real GDP. They found a strong evidence that healthcare is a necessity in Ghana. These variables need more and critical attention to achieve improved healthcare.

**Makuta and Hare (2015)** investigated whether or not the quality of governance (QoG) has a modifying effect on the impact of public health spending on health outcomes, measured by under-five mortality (U5M) and life expectancy at birth (LE), in South Africa. The study by using two staged least squares regression technique on panel data from 43 countries in SSA over the period 1996–2011, estimated the effect of public spending on health and quality of governance U5M and LE, GDP per capita and other socio economic factors. Public spending on health has a statistically significant impact in improving health outcomes. Its direct elasticity with respect to under-five mortality is between  $-0.09$  and  $-0.11$  while its semi-elasticity with respect to life expectancy is between  $0.35$  and  $0.60$ . The overall elasticity of PSH with respect to under-five mortality is between  $-0.17$  and  $-0.19$  while in countries with lower quality of governance, it is about  $-0.09$ . The corresponding semi elasticities with respect to life expectancy is about 6 in countries with higher QoG and about 3 in countries with lower QoG. Improving QoG would improve health outcomes in SSA. The same increase in PSH is twice as effective in reducing U5M and increasing LE in countries with good QoG when compared with countries with poor.

**Serdar (2015)** aimed to test the direct and indirect (external) effects of health expenditures on economic growth using the Feder Ram model. It used aggregate and manufacturing industrial production as total output, total government health expenditures, general government cure and pharmaceutical products health expenditures, general government medicine and health expenditures series belonging to the economy of Turkey between the 2006-2013 period using seasonally adjusted and real monthly data. The study pointed out that in general, the direct impact of government health expenditures on economic growth in Turkey is

positive and significant and its indirect impact is negative and significant. Moreover, when the coefficient calculated for efficiency is considered, it could be argued that while there are not very significant differences between the government health sector and other sectors, the government health sector is slightly more efficient.

**Ahmad and Hasan (2016)** analysed the relationship between government expenditure, governance and health outcomes particularly in developing countries. The study aimed the impact of public health expenditure and governance on health outcomes in Malaysia. An Autoregressive Distributed Lag (ARDL) co integration framework has been used to analyse data from 1984 to 2009. The results based on the bounds testing procedure showed that a stable, long run relationship exists between health outcomes and their determinants; namely income level, public health expenditure, corruption and government stability. The results also revealed that public health expenditure and corruption affect long and short run health outcomes in Malaysia. They suggested the Ministry of Health of Malaysia to conduct more consultations with other ministries and other stakeholders in health services to identify the needs and emphasize the importance of health program to the society.

Healthcare is a very essential commodity to all humanity. Improving the health status of the citizen may also have the potential to increase government spending on the sector. Also, government's ability to manage healthcare expenditure partly depends on obtaining accurate estimates of the underlying factors explaining healthcare expenditure. As health expenditure increases in the last years of life it is expected that health expenditure will increase as a result of demographic change. the sustainability of the improvements in main health indicators the importance attached to and the funds allocated for preventive health services shall be improved and maintained that this way the economic burden of inpatient treatment services can be reduced while the improvements in the main health indicators will be furthered. Therefore efficient use and sustainability of health expenditures are of vital importance.

## **2.4. HEALTH INFRASTRUCTURE**

Health Infrastructure is an important indicator to understand the healthcare delivery provisions and mechanisms in a country. It also signifies the investments and priority accorded to creating the infrastructure in public and private sectors. The health status of a region is

determined by its infrastructure facilities and the health services provided by them for the fulfillment of the needs of the society (Meade and Earickson, 2006). The health infrastructure consists of physical infrastructure, and public and professionals related to health services. The health infrastructure acts as the underlying base or foundation for health system to protect health in public, providing basic facilities and services needed for the better functioning of the society.. Access to better health facility has become an essential component of the health strategy. Better health is essential for overall development and happiness of any society. Provision of better health care to the people is an essential component of the state in achieving overall socioeconomic development. Health is a major component of welfare of any society. Every welfare state must accord top priority to investment in health infrastructure for two reasons.

- Improving health status may increase input and efficiency of human resources and stimulates economic growth.
- Good health may reduce communicable diseases which would save unnecessary economic expenditure achieved as a result of reduction in communicable diseases has external economies.

**Duggal (1994)** in his study on the utilization of health care in India, revealed that India has a plurality of health care systems as well as different systems of medicine. The government and local administrations provide public health care in hospitals and clinics. Public health care in rural areas is concentrated on prevention and promotion services to the detriment of curative services. The rural primary health centers are woefully underutilized because they fail to provide their clients with the desired amount of attention and medication and because they have inconvenient locations and long waiting times. Public hospitals provide 60 per cent of all hospitalizations, while the private sector provides 75 per cent of all routine care. The private sector is composed of an equal number of qualified doctors and unqualified practitioners, with a greater ratio of unqualified to qualified existing in less developed states. In rural areas, qualified doctors are clustered in areas where government services are available. With a population barely able to meet its nutritional needs, India needs universalization of health care provision to assure equity in health care access and availability instead of a large number of doctors who are profiting from the sicknesses of the poor.

Improving health in our nation requires strengthening four major domains of the health care system: personal health management, health care delivery, public health and health related

research. Many avoidable shortcomings in the health sector that result in poor quality are due to inaccessible data, information and knowledge. A national health information infrastructure (NHII) offers the connectivity and knowledge management essential to correct these shortcomings. Better health and a better health system are within their reach. A national health information infrastructure for the United States address the needs of personal health management, health care delivery, public health, and research. It should also address relevant global dimensions (e.g., standards for sharing data and knowledge across national boundaries). The public and private sectors will need to collaborate to build a robust national health information infrastructure, essentially a 'paperless' health care system, for the United States. **Detmer (2002)** asserted that federal government should assume leadership for assuring a national health information infrastructure as recommended by the National Committee on Vital and Health Statistics and the President's Information Technology Advisory Committee. Progress is needed in the areas of funding, incentives, standards, and continued refinement of a privacy (i.e., confidentiality and security) framework to facilitate personal identification for health purposes, Particular attention should be paid to NHII leadership and change management challenges.

A survey was conducted in rural Udaipur to gauge the delivery of health care and the impact it has on the health status of the largely poor population of the region. The study showed that the quality of public service is extremely low and that unqualified private providers account for the bulk of health care provision. The low quality of public facilities had an adverse influence on the people's health. Expectations of health care providers seem to be generally low and therefore the state has to take up the task of being the provider or regulator **Banerjee et.al., (2004)**.

**Deepa and Kathuria (2004)** attempted to analyze the performance of rural public health systems of 16 major states in India using the techniques from stochastic production frontier and panel data literature. The results showed that not all states with better health indicators have efficient health systems. Their study concluded that Investment in the health sector alone would not result in better health indicators. Efficient management of investment is required.

**Baker et.al., (2005)** reported the weakness of our public health infrastructure. They described major initiatives to systematically assess, invest in, rebuild and evaluate workforce competency, information systems and organizational capacity through public policy making,

practical initiatives and practice oriented research. These initiatives are based on applied science and a shared federal-state approach to public accountability. They concluded that a newly strengthened public health infrastructure must be sustained in the future through a balancing of the values inherent in the federal system.

**Krishna et.al., (2006)** found that better staff and physician interpersonal skills, facility infrastructure, and availability of drugs have the largest effect in improving patient satisfaction at public health facilities. In India and many developing countries, the excessive emphasis on service coverage and inputs in the provision of health services has ignored the needs of the very people for whom health services exist. Incorporating patient views into quality assessment offers one way of making health services more responsive to people's needs. It also gives users an opportunity to voice their opinion about their health services. While conducting this study, we found many instances in which patients were eager to record their concerns about the services they had received in the hope that some action would be taken. It is likely that the very act involving patients in evaluating their health services will make providers more sensitive and alert to patient needs, **Syed et.al., (2007)** also stated that improving medical care requires attention to service features that are regularly rated by patients. However, additional organizational and extra organizational issues that play a vital role must also be addressed to improve the health care system.

**Ashlesha et.al., (2007)** examined the role of health infrastructure and community health workers in expanding immunization coverage in rural India. The data was drawn from 43,416 children aged 2-35 months residing in rural India. They estimated separate multinomial logit regression models for polio and non polio vaccines that estimated the probability that a child would receive “no cover,” “some cover” or “full age-appropriate cover.” The key measure of health infrastructure was a hierarchical variable that assigned each child to categories (no facility, dispensary or clinic, sub-centre, primary health care centre, and hospital) based on the best health facility available in the child’s village. They also included variables capturing the availability of various types of community health workers in the village and other health infrastructure. While there was under-provision of rural health infrastructure, the results showed that the availability of health infrastructure had only a modest effect on immunization coverage. Larger and better-equipped facilities had bigger effects on immunization coverage. The presence of community health workers in the village was not associated with increased immunization

coverage. Their findings suggest that expanding the availability of fixed health infrastructure is unlikely to achieve the goal of universal coverage. Reforming community outreach programmes might be better strategy for increasing immunization coverage.

**Pradhan (2011)** investigated the link between health infrastructural inputs and outputs and their impact on economic growth in India during 1980–2005. The empirical investigation was carried out by simple regression technique and Granger causality test. The findings confirmed that health infrastructural inputs have substantial impact on health infrastructural outputs such as crude birth rate (CBR), crude death rate (CDR), infant mortality rate (IMR), life expectancy at birth (LER) and couple protection rate (CPR). The Granger causality further confirms that there is presence of unidirectional causality from economic growth to CBR, CDR, IMR and LER at birth. But it does not find any causality between economic growth and CPR. The study also finds no causality from CDR to IMR, CDR to CPR, IMR to CPR and LER at birth to CPR.

A health infrastructure index is developed using health inputs like number of hospitals and dispensaries, number of beds and number of doctors in government hospitals. **Lakshmi and Sahoo (2013)** examined the elasticity coefficients of health indicators with respect to health infrastructure of the state of Andhra Pradesh. Double log simple regression model is used to estimate elasticity coefficients. The empirical result shows that the elasticity coefficients of health indicators like crude birth rate, crude death rate, infant mortality rate and life expectancy at birth with respect to health infrastructure are -37.966, -27.816, -30.598 and 10.282 respectively. Values of  $R^2$  confirm that 70 percent of the variation in all most all health indicators is explained by health infrastructure. Thus, public health facilities are crucial for meeting the basic health requirements of masses in the state.

**Gupta and Patel (2014)** focused on health care facilities provided in India and more specifically the state of Odisha. The empirical study used a non experimental design to test a proposed model based on a review of relevant literature. Only state-sponsored hospitals were considered on a random sampling method. The analysis was conducted on a simple percentage method with closed-end options. It was found that even after 67 years of independence, people do not have access to basic medical care facilities in the rural areas and to some extent in semi urban areas also. The major stumbling block is inadequate infrastructure in these hospitals. The study offers some insight into the status of healthcare infrastructure in rural India, the sample

was limited to respondents in state-sponsored hospitals, which may not represent the views about private hospitals.

The study by **Chimamandanata (2014)** revealed that 92.4 percent of the participants indicated that health facilities is very accessible to their home, while 7.6 percent of the participants indicated that health facilities is not accessible to their home due to the swampy terrain. Also 3.0 percent of the participants sought alternative health practitioners because of natural herbs, 1.5 percent indicated spiritual basis of health and diseases, 4.5 percent indicated the use of medicinal herbs. in this modern era, health care system should be well grounded in routine surveillance and maintenance of the health sector, besides adequate management and strong leadership principles.

**Sudha and Manjunath (2015)** pointed out that health infrastructure has not been spread evenly throughout the state. As the study reveals most districts in the northern part of Karnataka have been suffering from inadequate health infrastructure. The state has not yet been successful in addressing the problems of health care inequalities. Turning to the trends in public expenditure on medical and public health, the data reveals interesting findings of the total public expenditure on medical and public health, the revenue expenditure has all along been higher than the capital expenditure. In respect of per capita health expenditure, there has been only a nominal rise i.e., from is Rs. 134 in 1995-96 to Rs. 263 in 2009-10. Interestingly health expenditure as per cent of NSDP which was 1.4 in 1995-96, turned out to be 1.5 in 2009-10 reflecting no tangible rise in health expenditure over the years. The public investment on health is not sufficient for the growing population. Hence, increased public investment on health is a necessary pre-requisite for achieving goals of growth, equity and stability.

**Basumatari (2016)** is of the opinion that health infrastructure acts as the underlying base or foundation for health system, providing basic facilities and services needed for the better functioning of the society. According to WHO statistics, India is lagging much behind many countries of the world (112th position) in health status (Annual Report, 2008). This is no less true in the case of Assam. India's health infrastructure system is currently based on 1,47,068 Sub-Centres, 23,673 Primary Health Centres, 4,535 Community Health Centres and 1,579 District Hospitals/Sub-divisional Hospitals to serve around 1.21 billion population (As on March 2010). In the case of Assam, 4,592 Sub-Centres, 844 Primary Health Centres, 108 Community Health Centres and merely 22 District Hospitals serve about 31.2 million populations. This is

indicative of the shortage of 471 Sub-Centres and 98 Community Health Centres in the state (RHS Bulletin, March 2008, M/O Health & F.W., GOI).

Infrastructure development in Indian cities is paltry and requires focused attention. The double digit growth rate that the country envisions in the coming decade faces immense infrastructural bottlenecks in cities. The larger cities attained inordinately large population sizes that have led to virtual collapse of urban services, followed by basic problems in housing, slum, water, infrastructure, quality of life, and other related aspects. Water, sanitation, sewerage, urban transport, city energy distribution, transport terminals, warehousing and logistics parks fall under the urban infrastructure category. Ancillary to the urban development is social infrastructure that includes healthcare, education, leisure and entertainment, retail, tourism, housing, exhibition and convention centres, hospitality, IT, and telecom.

## **2.5. OUT OF POCKET (OOP) HEALTH EXPENDITURES**

Out of pocket health care expenditure, where individuals and households pay for health care out of their own resources, is an important feature of health care systems all over the world. Furthermore, the impact of health care financing systems on the welfare of households, particularly poor households, is regarded as an important issue faced by policy makers when developing health care systems and insurance mechanisms (Xu et al., 2003).

**Mishra (2009)** examined the distribution of Out of Pocket (OOP) healthcare payments in India. The study analysed the magnitude and distribution of OOP spending across states and between rural and urban settings; second, to comprehend the impact of OOP payments on poverty and; third, to review progressivity of OOP payments and levels of healthcare utilisation. The study argued for policy initiatives to improve utilisation of healthcare services and to design financing mechanisms that safeguard poor from making unjust payments.

**Prinja et.al., (2012)** tried to ascertain inequities in health status, service utilization and Out Of Pocket (OOP) health expenditures in two States in north India namely, Haryana and Punjab, and Union Territory of Chandigarh. Data from National Sample Survey 60<sup>th</sup> Round on Morbidity and Health Care were analyzed by mean consumption expenditure quintiles. Indicators were devised to document inequities in the dimensions of horizontal and vertical inequity and redistribution of public subsidy. Concentration Index (CI) and equity ratio in conjunction with concentration curve were computed to measure inequity. Reporting of

morbidity and hospitalization rate had a pro-rich distribution in all three States indicating poor utilization of health services by low income households. Nearly 57 and 60 per cent households from poorest income quintile in Haryana and Punjab, respectively faced OOP hospitalization expenditure at 10 per cent threshold. The analysis indicated that public sector health service utilization needs to be improved. OOP health care expenditures at public sector institutions should be curtailed to improve utilization by poorer segments of population. Greater availability of medicines in public sector and regulation of their prices will provide a unique opportunity to reduce public sector OOP expenditure.

**Pal (2010)** attempted to modify definition of out-of-pocket health expenditure by characterizing it based on consumption of necessities. Health expenditure is defined as one which reduces the non-health expenditure to a level where household is unable to maintain consumption of necessities. Based on this definition of health expenditure, the study examined determinants of OOP health expenditure in India. Findings suggested that it is important to carefully revise the concept of catastrophic health care spending and the method developed in this paper can be considered as one of the possible alternatives. The findings also suggest that even after efforts to reduce differences among various social classes in India, socially deprived classes are still vulnerable as they are more likely to experience financial catastrophe due to illness.

**Dilek (2012)** analysed the prevalence of out of pocket health expenditure in Turkey and identified the factors which are associated with its risk using the Turkish Household Budget Surveys from 2002 to 2008. The results suggested that poor households are less likely to seek health care as compared to non poor households and that a negative relationship between poverty and experiencing health expenditure remains even after allowing for such selection bias. The study highlighted the factors such as insurance coverage, which may protect households from the risk of incurring catastrophic health expenditure.

**Archana et.al.,(2014)** assessed the out of pocket health spending among the households of Ramanathapuram, a village in Puducherry, where surplus health services were available free of cost. An exploratory study was conducted in 200 purposively selected households of Ramanathapuram. A total of 231 visits to health care facilities were recorded from 143 (71.5 per cent) households, of which 153 (66.2 per cent) were for acute illness and 68 (29.4 per cent) for follow up of chronic diseases and 10 (4.3 Q per cent) for hospitalization. The mean per visit

expenditure for acute illness, chronic diseases, and hospitalization were INR72.7 ± 143.6, 135.7 ± 196.2, and 1340 ± 1192.9, respectively. Government facilities were availed by 175 (75.7 per cent). Majority of those who incurred health expenditure for acute illness (80.4 per cent) utilized the private health services for acute illness (78.4 per cent) who were from higher socioeconomic class ( $P = 0.001$ ). The study concluded that majority (58.1 per cent) of the households did not incur health care expenditure. Public health care facilities were preferred (75.5 per cent) for seeking care. Availability of services free of cost reduces out of pocket expenditure among non-hospitalized cases.

**Apere (2014)** examined the determinant of out-of-pocket healthcare expenditure by using Heckman selection two step model. The study stated that state of residence, age of household head, family size, per capita consumption expenditure and adult equivalent weight together determines whether a person who falls sick will spend out of pocket for healthcare. Also, if a person falls sick and seeks healthcare services, age, age squared, household size, household size squared and per capita consumption expenditure proxy for per capita income. These are the factors that determine how much he/she spends out of pocket for healthcare, while aged people (those beyond 50 years of age) spend more out of pocket for healthcare and households with more than 7 members have little to spare and so spend less out of pocket on healthcare.

**Mohanty (2015)** tested the hypothesis that the monthly per capita household health spending of elderly households is significantly higher than non elderly households in India. Descriptive statistics and a two part model are used to understand the differentials in health expenditures across households. The results indicated that the monthly per capita health spending increases with economic status, occupation, age and educational attainment of the head of the household. While the health spending accounts 13 per cent of total consumption expenditure for elderly households, it was 7 per cent among households with elderly and non-elderly members, and 5 per cent among non elderly households. Controlling for socio economic and demographic correlates, the per capita household health spending among elderly households and among household with elderly and non elderly members was significantly higher than non elderly households. The health expenditure is for poorer households, casual labour and households with elderly members. Based on the finding it was suggested to increased access to health insurance and public spending on geriatric care to reduce the out of pocket expenditure on health care in India.

**Shaikh and Singh (2016)** aimed to analyze health care expenditures in seven South Asian countries, namely, India, Pakistan, Sri Lanka, Maldives, Bhutan, Bangladesh and Nepal. The data are taken for 19 years from 1995 to 2013. Per capita health expenditure differences have been compared. Regression model for out of pocket expenditure with the factors affecting it, that is, per capita health expenditure, household final consumption expenditure and public health expenditure. Logarithm values of out of pocket (OOP) expenditure have also been used to develop a separate log model for the same. The results pointed out that Maldives has the highest per capita health expenditure, while out of pocket health expenditure as a percentage of total expenditure on health is the highest for India. The key determinant of out of pocket expenditures is the final household expenditures as the percentage of GDP. [esearchpp1-](#)

Out of Pocket health expenditure and factors affecting it and to understand the impact PFHI on OOP in India was assessed by **Krishnan (2016)**. The utilization of public services for outpatient (O P) care like sub centers, primary health center, Community health centres were 25per cent and inpatient (IP) care was 40 per cent. OP expenditure has increased > 100 per cent and IP care expenditure almost 300per cent increased during last ten years. More than 80 per cent of the expenditure are met by out of pocket (OOP). The morbidities cost per illness episode were inevitably increased in the last decade in India. The increase in life expectancy, demographic change of more aged population coupled with chronic disease will increase the morbidity and health expenditure in the future. Unless overt reliance on unregulated private sector are systematically corrected by alternative health financing mechanisms and strengthening public health system “right for health” will be a distant dream for common citizens.

Some developing countries have initiated demand-side financing schemes promoting institutional delivery **Issac (2016)**. In the context of conditional cash incentive scheme and free maternity care in public health facilities in India, studies have highlighted high out of pocket expenditure (OOPE) of Indian families for delivery and maternity care. It also assesses the determinants of OOPE and the level of maternal satisfaction while accessing care from these facilities. In a cross-sectional analysis of 55 have delivered at four public health facilities in Uttar Pradesh, India. The analysis showed that the median OOPE was INR 700 (US\$ 11.48) which varied between INR 680 (US\$ 11.15) for normal delivery and INR 970 (US\$ 15.9) for complicated cases. Tips for getting services (consisting of gifts and tips for services) with a median value of INR 320 (US\$ 5.25) contributed to the major share in OOPE. Even though

services at the public health facilities in India are supposed to be provided free of cost, it is actually not free, and the women in this study paid almost half of their mandated cash incentives to obtain delivery care.

**Masiye and Oliver (2016)** assessed the factors associated with healthcare choices among sick people, and the determinants of the magnitude of out of pocket (OOP) payments. The study used a multilevel multinomial logistic regression to model the determinants of an individual's choice of healthcare options following an illness. The study observed that OOP expenditure is significantly dependent on household economic well being, distance from a health facility, among other factors. A 10 per cent increase in per capita consumption expenditure was associated with a 0.2 per cent increase in OOP health expenditure while every kilo metre travelled was associated with a K 0.51 increase in OOP health expenditure. The findings also suggested that the benefits of free public healthcare may not reach the poorest proportionately, which raise implications for increasing access in Zambia and other countries in sub Saharan Africa.

**Jayakrishnan et.al., (2016)** made a substantial contribution in analysing the utilization of public services for outpatient (O P) care like sub centers, primary health centers , Community health centres. More than 80 per cent of the expenditure were met by out of pocket (OOP).Rural households primarily depended on their 'household income / savings' (68 per cent) and 'borrowings' (25 per cent), while the urban households relied much more on their 'income / saving' (75 per cent) for financing expenditure on hospitalizations, and '(18 per cent) on borrowings. Even from the upper quintile, both rural and urban areas have borrowed money to meet the hospital expenditure which was 23 per cent and 14 per cent respectively. Only 12 per cent urban and 13 per cent rural population received any protection coverage through any of the PFHI like "Rashtriya Swasthya Bhima yojana" (RSBY).

**Lancet et.al., (2017)** estimated future gross domestic product (GDP), all-sector government spending, and health spending disaggregated by source, and we compare expected future spending to potential future spending. They extracted GDP, government spending in 184 countries from 1980–2015, and health spend data from 1995–2014. They used a series of ensemble models to estimate future GDP, all-sector government spending, development assistance for health and government, out of pocket, and prepaid private health spending through 2040. The study found out estimated that global spending on health will increase from US\$9.21

trillion in 2014 to \$24.24 trillion in 2040. The study expected that per capita health spending to increase fastest in upper middle- income countries, at 5.3 per cent (UI 4.1–6.8) per year. This growth is driven by continued growth in GDP, government spending, and government health spending. Lower-middle income countries are expected to grow at 4.2 per cent (3.8–4.9). High-income countries are expected to grow at 2.1 per cent (UI 1.8–2.4) and low-income countries are expected to grow at 1.8 per cent (1.0–2.8). Despite this growth, health spending per capita in low-income countries is expected to remain low, at \$154 (UI 133–181) per capita in 2030 and \$195 (157–258) per capita in 2040. Increases in national health spending to reach the level of the countries who spend the most on health, relative to their level of economic development, would mean \$321 (157–258) per capita was available for health in 2040 in low-income countries

Out of pocket expenditure (OOPE) is an obstacle in the path of getting universal health coverage in India. **Sundar (2017)** aimed to explore the OOPE, sources of funding, and experience of expenditure (CE) for healthcare related to delivery, postpartum, and neonatal morbidity. A community based, cross sectional survey was conducted among a sample of 240 recently delivered women from the slums of Bhubaneswar, Odisha. The study found only 29.6per cent of the households incurred OOPE and the others incurred either nil OOPE or had a net income because of benefits received from Janani Shishu Suraksha Karyakram (JSSK), Janani Suraksha Yojana (JSY), and “Mamata” schemes of the government. The median total OOPE was found to be 2100 INR (100–38,620). Multivariate analysis found parity, place of delivery, type of delivery and presence of morbidity to be significantly associated with incurring any OOPE.

Out-of-pocket expenditure (OoPE) is an obstacle in the path of getting universal health coverage in India. **Sahu and Bharati (2017)** explored the OOPE, sources of funding and experience of catastrophic expenditure (CE) for healthcare related to delivery, postpartum and neonatal morbidity. The study pointed out that only 29.6 per cent of the households incurred OOPE and the others incurred either nil OOPE or had a net income because of benefits received from Janani Shishu Suraksha Karyakram (JSSK), Janani Suraksha Yojana (JSY) and “Mamata” schemes of the government.

out-of-pocket is widely accepted as the financial protection against high levels of out-of-pocket health expenditure should be one of the primary goals in designing health sector reform strategies since it has been argued that high levels of out-of-pocket health expenditure violate the

vertical equity principle, which requires that payment should be related to ability to pay (World Health Organisation, 2000).

## **2.6. OTHER RELATED STUDIES**

Healthcare is a very essential commodity to all humanity. Healthcare needs are therefore increasing due to the current nature of working and life styles which have rendered many people less active physically. Obviously, as healthcare needs rise, one would expect expenditure on health to also rise to cater for the needs of the people and also the related aspects like public spending on health care, foreign direct investment in health care, impact of health care, etc.,

**Bidani and Ravallion (1997)** explained the use of two dollar per day poverty line to decompose health indicators into subgroup averages for 35 countries using a random coefficients model. The study found that the poor have comparatively worse health status, and they are affected more by public spending on health care, than the better off.

Healthcare is one the fastest growing service sector in India. Given the growing importance of the health care sector and the significant development of trade in health services, foreign direct investment (FDI) in this sector has gathered momentum in the recent years. Since January 2000, FDI is permitted up to 100 percent under the automatic route in hospitals in India. Therefore, there is growing interest among foreign players to enter India's healthcare sector through capital investments, technology tie-ups, and collaborative ventures across various segments, including diagnostics, medical equipment, hospitals, and education and training. **Itumalla and Acharyulu(2012)** point out the current status of FDI in Hospitals, to identify some of the challenges and opportunities in this industry. The study is descriptive in nature and based on the secondary data that is gathered from the books, articles, reports of Department of Industrial Policy and Promotion and other valid online sources. The results of this study provide the current status of FDI in Hospitals and diagnostic centres and challenges and opportunities in healthcare sector. However, as positive sentiment for doing business in India is resurfacing, inflow of FDI in India is rising. Further, FDI in healthcare especially hospitals is understood to pay off rich dividends and good returns on investment in the long run.

**Stefane et.al., (2006)** examined the health care system from a global perspective and the importance of human resources management (HRM) in improving overall patient health outcomes and delivery of health care services. The study explored the published literature and

collected data through secondary sources. The result of the study showed the various success factors emerge that clearly affect health care practices and human resources management. This paper will reveal how human resources management is essential to any health care system and how it can improve health care models. Challenges in the health care systems in Canada, the United States of America and various developing countries are examined and also suggested to overcome these problems through the proper implementation of human resources management practices. Comparing and contrasting selected countries allowed a deeper understanding of the practical and crucial role of human resources management in health care.

**Kristine et.al.,(2016)** investigated the broader economic benefits of investing in women's health. The study used the Preferred Reporting Items for Systematic Reviews and Meta Analysis (PRISMA) guidelines, they systematically reviewed health, gender, and economic literature to identify studies that investigate the impact of women's health on micro- and macroeconomic outcomes. They developed an extensive search algorithm and conducted searches using 10 unique databases spanning the timeframe 01/01/1970 to 01/04/2013. In total, the two lead investigators independently screened 20,832 abstracts and extracted 438 records for full text review. The final review reflects the inclusion of 124 articles. The existing literature indicates that healthier women and their children contribute to more productive and better-educated societies. The study documented an extensive literature confirming that women's health is tied to long-term productivity, the development and economic performance of nations depends, in part, upon how each country protects and promotes the health of women. Providing opportunities for deliberate family planning; healthy mothers before, during, and after childbirth, and the health and productivity of subsequent generations can catalyze a cycle of positive societal development. The study highlighted the untapped potential of initiatives that aim to address women's health. Societies that prioritize women's health will likely have better population health overall, and will remain more productive for generations to come.

**Brijesh (2001)** summarized the impact of structural adjustment in the Indian rural healthcare sector has been felt in the reduction in central grants to States for public health and disease control programmes. This falling share of central grants has had a more pronounced impact on the poorer states, which have found it more difficult to raise local resources to compensate for this loss of revenue. With the continued pace of reforms, the likelihood of increasing State expenditure on the health care sector is limited in the future. As a result, a

number of notable trends are appearing in the Indian healthcare sector. The policy responses to these private initiatives are reflected in measures comprising strategies to attract private sector participation and management inputs into primary health care centres (PHCs), privatization or semi-privatization of public health facilities such as non-clinical services in public hospitals, innovating ways to finance public health facilities through non budgetary measures, and tax incentives by the State governments to encourage private sector investment in the health sector. Bearing in mind the vital importance of such market forces and policy responses in shaping the future health care scenario in India, this article examines in detail both of these aspects and their implications for the Indian health care sector.

**Karatzas (2000)** suggested that per capita real private expenditure is both income inelastic and price inelastic. This indicates that per capita health care expenditure is a necessity in contrast with the argument that it is a luxury good. Karatzas (2000) found that apart from per capita real income, non-income factors such as that of supply related also determine per capita real health care outlay. However, he singled out ageing population as being insignificant in most subcomponent of his analysis. There is no supporting evidence indicating that the rise of the US's ageing population had any significant impact on per capita real health care outlay during the sample period

**Rahmqvisti et.al., (2010)** found the two-dimensional outcome in the QSP model: Importance and Quality that younger patients in emergency were least satisfied group and older patient with excellent health status were the most satisfied group. Patients with perceived better health status and those with less education were more satisfied than those with more education or poorer health status. The two dimensions most strongly associated with global satisfaction were receiving the expected medical help and being treated well by the doctor. The reception without getting information correlated negatively to patient satisfaction. Also participation in the medical decision making is correlated positively.

Health is both a resource for, as well as an outcome of, sustainable development. The goals of sustainable development cannot be achieved when there is a high prevalence of debilitating illness and poverty. Development not only the height of the economic indicators, are expressed in terms of education, health and social structure. The amount of health expenditure is one of most important indicators of development. All the countries and associations aimed to improve the health conditions and expenditures. Healthy generation is a part of qualified human resources and huge importance for sustainable development.

## **CHAPTER III**

### **METHODOLOGY**

The Methodology adopted for the current study “An Overview of Health care Expenditure in India” is discussed under the following heads.

- 3.1. Selection of the topic
- 3.2. Sources and collection of data
- 3.3. Tools used
- 3.4. Definition and Terms Used and
- 3.5. Limitations of the Study

#### **3.1. SELECTION OF THE TOPIC**

Health is a primary and essential input for human development in the country. A constantly sick person, in spite of high income and education cannot enjoy life and would contribute very little to the society. Health care is critical in improving health status and good health is necessary for empowerment. Good health helps to reduce absenteeism, enhance labor productivity and prevent misery. The role of government is to provide and regulate the health services, along with other social activities and it is particularly important for developing countries to concentrate on the poor.

The health of population and individual is inextricably bound up with development. Health related barriers to buildup human capital is important for achieving the higher level of income. The challenges in this sector faces a substantial need to increase birth rates, to reduce death rates, to reduce mortality rates, to improve infrastructure facilities, necessity to provide health insurance, ensuring availability of trained medical staffs and technologies.

The need of health care in India is huge and different. Health indicators such as maternal mortality ratio, infant mortality rate and life expectancy at birth are required in bridging the shortfall in the availability of health infrastructure and its rescue for better health outcomes. Health financing is an important to plan the health system. Health financing structure is one

which not only reduces the ‘out of pocket’ (OOP) expenditure on health care but also lessens the probability of any financial need while meeting health care need.

The concept of human capital has gained comparatively more importance in labour surplus countries that include India too. India is naturally capable with more of labour due to high birth rate under given climatic conditions. Therefore the burden of spending for health care falls directly on households and a major part of health care expenditure in India is out of pocket expenditure by people which has strong unfavorable implication for the poor (Jeny, 2016). With the population of 1.21 Crores in India, the government is spending only 1.3 per cent in terms of GDP for health sector. When compared to the developed and many developing countries the share of public expenditure in the countries total expenditure on health sector appears to be very low for India and it is lower than other Asian countries like China (3.1 per cent), Malaysia (2.2 per cent), Srilanka (1.4 per cent), Thailand (3.7 per cent) and Bangladesh (1.3 per cent) in terms of public expenditure on health care as a proportion of the gross domestic product.

There are several health indicators which determine economic growth. The current study has taken up determinants like Net state Domestic Product, Per capita Net state Domestic Product, Health expenditure, Per capita health expenditure, Sex ratio, Infant Mortality rate, Crude Death rate, Crude Birth rate, Hospitals, Beds, Doctors, Literacy rate, etc.,

Adolph Wagner, the renowned German political economist (1835-1913) believed that a functional “Cause and Effect” relationship exists between the growth of an economy and the growth of the public sector. He presented his famous ‘Law of ever increasing state activity’ that indicates that the social progress was the basic cause of the relative growth of state activities. On the other hand, Keynesian macro economic theories assume that public expenditure causes national income. In “The General Theory of Employment, Interest and Money” (1936) Keynes sounds the death-knell to the classical thoughts. He totally repudiated the concept of laissez faire and argues that economic growth is possible only through the expansion of fiscal activities of the state. On the above background, the present study investigates whether the Keynesian approach or Wagnerian approach is valid on the relationship between health care expenditure and economic growth. The relationship between health care expenditure and economic growth is well studied. However, the direction of causality is still under controversy that is whether health care expenditure leads to economic growth or economic growth leads to health. So this study considers certain indicators which has an impact on economic growth in states namely Andhra

Pradesh, Arunachal Pradesh, Assam, Bihar, Chattisgarh, Delhi, Goa, Gujarat, Haryana, Himachal Pradesh, Jammu and Kashmir, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Odisha, Punjab, Rajasthan, Sikkim, Tamil Nadu, Tripura, Uttar Pradesh, Uttarakhand and West Bengal.

### **3.2. SOURCES OF DATA**

The secondary data was used for the study. The major source of information is Sample registration system, Ministry of Health and Family Welfare Reports, World Health Reports, Central Bureau of Health Intelligence (CBHI), Census of India, Directorate General of State Health Services, National Health Profile and All India Central Statistics Office.

### **3.3. STUDY PERIOD**

Secondary data pertaining to three different years 2001, 2010, 2015 were considered for the study.

### **3.4. TOOLS USED**

Due to big difference in the size of population and area of selected states, indicators of development are not comparable in aggregate and hence do not portray the true picture regarding disparities in India. Standardized data on the basis of population/area, in ratio and percentages are more suitable to estimate the magnitude of inter-state disparities in public health.

Following techniques were applied to analyze the data for achieving the desired objectives. These techniques are discussed below:

### **REGRESSION ANALYSIS**

Regression is the determinant of a statistical relationship between two or more variables. In simple regression, we have only two variables, one variables (defined as independent) is the cause of the behaviour of another one (defined as dependent variable). Regression can only interpret what exists physically i.e., there must be a physical way in which independent variable X can affect dependent variable Y. The basic relationship between X and Y is given by

$$\hat{Y} = a + bX$$

where the symbol  $\hat{Y}$  denotes the estimated value of Y for a given value of X. This equation is known as the regression equation of Y on X which means that each unit change in X produces a change of  $\beta$  in Y, which is positive for direct and negative for inverse relationships.

In order to identify and isolate the factors which were responsible for interstate variations in health status and public health expenditure, Simple regression analysis has been applied to determine the relative contribution of different explanatory variables on dependant variable. The results of simple regression between health indicators as dependant variable and per capita public health expenditure (PCHE) as independent variable for the year 2001, 2011 and 2015 are given in the following regression equations.

### **Regression Equations**

$$SR = \alpha + \beta \text{ PCHE} + e$$

$$LIT = \alpha + \beta \text{ PCHE} + e$$

$$CDR = \alpha + \beta \text{ PCHE} + e$$

$$CBR = \alpha + \beta \text{ PCHE} + e$$

$$IMR = \alpha + \beta \text{ PCHE} + e$$

$$HOSP = \alpha + \beta \text{ PCHE} + e$$

$$BEDS = \alpha + \beta \text{ PCHE} + e$$

$$DRS = \alpha + \beta \text{ PCHE} + e$$

In the given regression equation

PCHE = Per capita health expenditure

SR = Sex ratio

LIT = Literacy rate

CDR = Crude Death rate

CBR = Crude Birth rate

IMR = Infant Mortality rate

HOSP = Hospitals served per 000' population

BEDS = Beds served per 000' population

DRS = Doctors served per 000' population

## **DURBIN WATSON TEST**

The casual relationship between health care expenditure and economic growth on the different states based on an annual data series from the period 2001 to 2015 were examined. The necessary information collected from various sources were analyzed. In economic literature, the concept of integrating series was introduced by Granger (1980, 81). The rationality behind co integration techniques is that if, in the long run, two or more series move closely together, even though the series themselves are trended, the difference between them is constant. Mathematically, for  $Y_t$  and  $X_t$  (both I (i)) if there exists a constant ' $\alpha$ ' such that  $X_t - \alpha Y_t$  is I(0), then the two series are co-integrated with ' $\alpha$ ' as co integrating parameter.  $X_t = \alpha Y_t$  is the long run 'equilibrium' relation and sometimes termed as 'attractor' (Granger, 1988) and any deviation from this measures the degree to which the series are out of equilibrium. A lack of co integration suggests that such variables have no long-run relationship. The precondition for the co integration technique is the series  $X_t$  and  $Y_t$  should be stationary in the same order. Co integrating regression are estimated by adopting the test procedures such as co integrating regression Durbin Watson test, it requires the estimation of co integrating regression on the following equation:

$$y_t = \alpha + \beta X_t + U_t \text{ ----- (1)}$$

By using Ordinary least square method, residuals are obtained, and then Co integration Regression test is employed.

## **CONCEPTS USED**

The study has undertaken variables such as Sex Ratio, Literacy Rate, Crude Birth Rate (CBR), Crude Death Rate (CDR), Infant Mortality Rate (IMR), Doctors per '000 of population, Hospitals per '000 of population, Beds per '000 of population, Public Health Expenditure, Per capita Public Health Expenditure, National and State domestic product, Per capita National state domestic product.

## **SEX RATIO**

Sex ratio is defined as number of females per 1000 males. The sex ratio has come down to 914 in the 2011 census from 927 in the 2001 census.. The decline in sex ratio there is an impact of economic growth also stated by Sardana, 2013. There are various reasons for decline in sex ratio such as foeticide, infanticide and neglect to do away with the girl child at pre-birth and also due to many social reasons like the increasing demand for dowry, the increasing violence against women, prevention of division of property, etc., Social discourses should contribute to raising awareness among people to save the girl child and desist from practices such as foeticide otherwise their own life will suffer. The stage is set for a coordinated effort of various groups with the intention to establish a mission to reverse the trend of decline in sex ratio. Reversal of the declining trend is a must to ensure stable economic and societal growth.

## **LITERACY RATE**

Literacy is always considered to be an important key for socio-economic growth. Economic prosperity of a country entirely depends on the economic resources it has and human resource is an important part of economic resource. Human resource includes the population, its growth rate, skills, standard of living and the working capacity of the labor force and all the above factors can be enhanced by increasing the literacy rate of a population. Thus literacy rate plays a key role in economic growth of a country, (Desai, 2002). Japan can be an example where an economy has developed by excelling in human resources despite the deficiency of natural resource. As the biggest asset India has is its human resource, effective utilization of the human resource becomes very crucial for the country's economic progress and thus literacy plays all the more an important role in determining India's growth.

## **CRUDE BIRTH RATE**

Crude birth rate is defined as the number of live births per year per 1000 population. It is calculated as under:.

$$\text{Crude Birth rate} = \frac{B}{P} * 1000$$

Where B is number of births

P is midyear population

## **CRUDE DEATH RATE**

Crude death rate is defined as the total number of deaths in a year per 1000 people. It is calculated as under:

$$\text{Crude Death rate} = \frac{D}{P} * 1000$$

Where D is number of deaths

P is midyear population

## **INFANT MORTALITY RATE**

Infant Mortality Rate (IMR) is defined as the number of infant deaths in a year per 1000 of live births during the year. Infant mortality is an indicator of the health status not only of infants, but also of the whole population and of their poverty ridden social and economic status in the country. They face excessive vulnerability, as underprivileged, to a hostile environment and suffer, malnutrition and serious health problems. All this leads to high rates of infant mortality and morbidity. It was recorded that there was rapid decline in infant mortality. The current period of slow decline has made it difficult to achieve the National Child mortality goals by 2000. The reduction in infant and child mortality was declared as the major goal of our official strategy to achieve Health for All By 2000. According to the Government of India (2015), Infant Mortality Rate is considered a primary and important indicator of a geographic area's overall health status or quality of life. Reduction of infant and child mortality has been an important tent of the health policy of the government. The National Population Policy (NPP) 2000, the National Health Policy 2002 and National Rural Health Mission (NRHM 2005-2012) have laid down the goal. Reduction in IMR is also included in one of the Millennium Development Goals adopted by the United Nations in 2000. India witnessed a declining trend in the infant mortality rate over the years. Infant mortality rate has declined by 70 per cent from 139 in 1972 to 42 in 2012 and slope down to 40.5 in 2016. A consistent decreasing trend has been observed from 1998-2016.

## **NET STATE DOMESTIC PRODUCT**

Net State Domestic Product (NSDP) is defined as a measure, in monetary terms, of the volume of all goods and services produced within the boundaries of the State during a given period of time after deducting the wear and tear or depreciation, accounted without duplication.

## **PER CAPITA NET STATE DOMESTIC PRODUCT**

The Per Capita Net State Domestic Product is to provide details of percentage growth of Per Capita Net State Domestic Product over the previous year. Health is a state subject, it is important to examine interstate differences in spending patterns while the central government provides funds to the states under centrally sponsored schemes based on uniform norms, per capita expenditure in states varies depending upon the prevalence of diseases and utilisation of funds allocated.

## **HEALTH EXPENDITURES**

Health Expenditures covers the provision of preventive and curative health services, public health affairs and services, health applied research and medical supply and delivery systems, but it does not include provision of water and sanitation.

## **PUBLIC EXPENDITURES ON HEALTH**

Annual public health expenditure as a proportion of the national health expenditure. The size of the public expenditure on health care goods and services for a given national economy, at a given period of the corresponding national health expenditure. It represents the governmental share, not limited to the ministry of health, of the total annual expenditure for covering the provision of preventive and curative health services, public health affairs and services, health applied research, and medical supply and delivery systems, excluding the provision of water and sanitation.

## **PER CAPITA PUBLIC HEALTH EXPENDITURE**

Per Capita Public Health Expenditure is defined as the total expenditure is the sum of public and private health expenditure as a ratio of total population. Income (per capita GDP) has

been identified as a very important factor for explaining differences across countries in the level and growth of total health care expenditures. Health and human development, in addition to per capita income, form an integral part of the overall socio economic development of a nation.

## **DOCTORS**

Doctor is a person who is qualified to treat people who are ill. Doctors examine, diagnose and treat patients who have been referred to the hospital and other health professionals. They apply medical knowledge and skills to the diagnosis, prevention and management of disease. Doctors work within a number of specialties. Doctors make important contribution to the management and leadership of health services and the delivery of healthcare.

## **HOSPITALS**

Hospital is an institution providing medical and surgical treatment and nursing care for sick or injured people. Hospitals are the primary unit to avail health facilities. There are number of hospitals that provide health facilities to the public. Hospitals and Healthcare institutions have consistently focused on improving the patients experience and providing services in timely and orderly fashion. However it is often difficult to rate the quality of services (both clinical and non clinical), using similar indicators. For a hospital or a healthcare institution, it is imperative to understand the components which can influence the overall quality of medical care services.

## **BEDS**

A hospital bed or hospital cot is a bed specially designed for hospitalized patients or others in need of some form of health care. These beds have special features both for the comfort and well-being of the patient and for the convenience of health care workers. Hospital beds and other similar types of beds are used not only in hospitals, but in other health care facilities and settings, such as nursing homes, assisted living facilities, outpatient clinics, and in home health care.

### **3.5. LIMITATIONS OF THE STUDY**

The study is based on secondary data and the limitation of the present study is that it is confined only to a particular reference period and the findings may not suit for other reference periods.

## CHAPTER IV

### RESULTS AND DISCUSSION

The result of the study " An Overview of Health care Expenditure in India" are presented and discussed under the following heads.

- 4.1. Sex Ratio
- 4.2. Literacy Rate
- 4.3. Crude Birth Rate
- 4.4. Crude Death Rate
- 4.5. Infant Mortality Rate
- 4.6. Number of Hospitals (In 000's)
- 4.7. Number of Beds (In 000's)
- 4.8. Number of Doctors
- 4.9. National State Domestic Product
- 4.10. Per Capita National State Domestic Product
- 4.11. Health Expenditure
- 4.12. Per Capita Health Expenditure

#### **4.1. SEX RATIO**

Sex ratio is defined as the number of females per 1,000 male population. Sex ratio is one indicator of economic development. Higher the sex ratio greater is the economic growth. In advanced economies sex ratio is high while in developing economies it is low. The disappearance of women due to various reasons like female infanticide, dowry deaths, domestic violence, suicide by females are some of the reasons for the poor sex ratio which is prevalent in India. Sex ratio is an important to measure the extent of the prevailing equity between males and females in a society. Changes in sex ratio largely reflect the underlying socio economic and cultural patterns of a society in different ways. Determinants of changes in sex ratio vary from sex differentials in mortality, sex selective migration, sex ratio at birth, and at times, sex

differentials in population enumeration. India is one of the few countries in the world where males outnumber females. The declining sex ratio is a matter of great concern, as it will lead to serious demographic imbalances and adverse social consequences. However, the high incidence of induced abortions leads to a sharp decline in the child sex ratio. The sex ratios in different states of India during the three different periods are given in the following Table 4.

**TABLE 4**  
**SEX RATIO**

S.NO	STATES	2001	2011	2015
1	Andhra Pradesh	978	993	1020
2	Arunachal Pradesh	893	938	958
3	Assam	935	958	993
4	Bihar	919	918	1062
5	Chattisgarh	989	991	1019
6	Delhi	821	868	849
7	Goa	961	973	1018
8	Gujarat	920	919	950
9	Haryana	861	879	876
10	Himachal Pradesh	968	972	1078
11	J & K	892	889	972
12	Jharkhand	941	948	1002
13	Karnataka	965	973	979
14	Kerala	1,058	1084	1049
15	Madhya Pradesh	919	931	948
16	Maharashtra	922	929	952
17	Manipur	978	985	1049
18	Meghalaya	972	989	1005
19	Mizoram	935	976	1013
20	Nagaland	900	931	968
21	Odisha	972	979	1038
22	Punjab	876	895	905
23	Rajasthan	921	928	973
24	Sikkim	875	890	942
25	Tamil Nadu	987	996	1033
26	Tripura	948	960	998
27	Uttar Pradesh	898	912	995
28	Uttarakhand	962	963	1015
29	West Bengal	934	950	1011
30	India	933	943	991

Source: Censuses of India, 2001, 2011 and NFHS 4

The sex ratio in different states of India over a period of 15 years at different time intervals - 2001, 2010 and 2015 reveals that there is a unique increase in the sex ratio in all the states of India. In states like Himachal Pradesh it is 968 in 2001, 972 in 2011 and 1078 in 2015, in Bihar it is 919 in 2001, 918 in 2011 and 1062 in 2015, in Kerala it is 1058 in 2001. Though there was a slight increase to 1084 in 2011 it declined to 1049 in 2015. In Andhra Pradesh it is 978 in 2001, 993 in 2011 and 1020 in 2015, in Tamil Nadu it is 987 in 2001, 996 in 2011 and 1033 in 2015, in Manipur it is 978 in 2001, 985 in 2011 and 1049 in 2015, in Chattisgarh it is 989 in 2001, 991 in 2011, 1019 in 2015, in Odisha it is 972 in 2001, 979 in 2011 and 1038 in 2015, in Goa it is 961 in 2001, 973 in 2011 and 1018 in 2015, are some of the state which lead to more than 90 per cent. There are many factors behind the trend of declining sex ratio. Sex selection and medical technology is misused in India for detecting the sex of unborn child and ultimately for the sex selection. Female foetuses, are identified and aborted. Sex determination is the main reason of low sex ratio in India followed by abortion for female fetouses. Besides the misuse of the technology, the patriarchal societies in many parts of India have translated their prejudice and bigotry into a compulsive preference for boys and discriminations against the girl child. Apart from this violence against women, dowry death, delivery deaths and suicide result in poor sex ratio.

## **LITERACY RATE**

Any person who is able to read and write with understanding in any language is known as literate. Literacy rate is one of the determinants of human capital. India has its human resource, effective utilization becomes very essential for the country's economic progress. People with more favourable socio-economic position have better health compared with those who are less well off. Literacy and educational development helps improve the quality of life, learning levels and nutritional level of children. If the female is literate, it will improve the health status of their family. Thus, the literacy rate is considered as an important factor for economic development. The literacy rate in different states in India is given in the following Table 5.

**TABLE 5**  
**LITERACY RATE**

S.NO	STATES	2001	2011	2015
1	Andhra Pradesh	60.47	67.66	79.4
2	Arunachal Pradesh	54.34	66.95	84.5
3	Assam	63.25	73.18	82.8
4	Bihar	47.00	63.82	77.8
5	Chattisgarh	64.66	71.04	85.7
6	Delhi	81.67	86.34	89.3
7	Goa	82.01	87.40	94.7
8	Gujarat	69.14	79.31	89.6
9	Haryana	67.91	76.64	90.6
10	Himachal Pradesh	76.48	83.78	96.2
11	J & K	55.52	68.74	87.0
12	Jharkhand	53.56	67.63	79.7
13	Karnataka	66.64	75.60	85.1
14	Kerala	90.86	93.91	98.7
15	Madhya Pradesh	63.74	70.63	81.8
16	Maharashtra	76.88	82.91	92.8
17	Manipur	70.53	79.85	96.0
18	Meghalaya	62.56	75.48	84.0
19	Mizoram	88.80	91.58	98.2
20	Nagaland	66.59	80.11	85.6
21	Odisha	63.08	73.45	84.3
22	Punjab	69.65	76.68	87.5
23	Rajasthan	60.41	67.06	85.4
24	Sikkim	68.81	82.20	91.5
25	Tamil Nadu	73.45	80.33	89.1
26	Tripura	73.19	87.75	89.5
27	Uttar Pradesh	56.27	69.72	82.4
28	Uttarakhand	71.62	79.63	90.7
29	West Bengal	68.64	77.08	81.1
30	India	64.84	74.04	85.7

**Source: Censuses of India 2001, 2011, NFHS 4**

The literacy rate in India among different states over a period of 15 years at different time intervals 2001, 2010 and 2015 reveals that there is a tremendous rise in the literacy rate in all the states of India. The states/union territories like Kerala, Mizoram, Manipur Himachal Pradesh, Goa, Maharashtra, Sikkim, Haryana has a leading in the list with more than 90 per cent of literates during 2014-15. In 2001 there was only one state (Kerala) with 90.86 per

cent of literates but in a span of one and half decades the growth of literates among the states has been tremendous.

### **CRUDE BIRTH RATE**

Crude Birth rate refers to the ratio of the number of live births in a year to the mid year population, normally expressed per thousand of population. The birth rate is usually the dominant factor in determining the rate of population growth. It depends on both the level of fertility and the age structure of the population. Birth rates ranging from 10–20 births per 1,000 are considered low, while rates from 40 to 50 births per 1,000 are considered high. There are problems associated with both extremes. High birth rates may stress government welfare and family programs. Additional problems faced by a country with a high birth rate include educating a growing number of children, creating jobs for these children when they enter the workforce, and dealing with the environmental impact of a large population. Low birth rates may stress the government to provide adequate senior welfare systems and stress families who must support the elders themselves.. It is an important indicator of health status. The crude birth rates of different states in India are given in Table 6.

**TABLE 6****CRUDE BIRTH RATE**

S.NO	STATES	2001	2011	2014-2015
1	Andhra Pradesh	21	17.5	16.8
2	Arunachal Pradesh	22.2	19.8	18.8
3	Assam	27	22.8	22.0
4	Bihar	31.2	27.7	26.3
5	Chattisgarh	26.5	24.9	23.2
6	Delhi	18.9	17.5	16.4
7	Goa	14.2	13.3	12.7
8	Gujarat	25	21.3	20.4
9	Haryana	26.8	21.8	20.9
10	Himachal Pradesh	21.2	16.5	16.3
11	J & K	20.2	17.8	16.2
12	Jharkhand	26.2	25.0	23.5
13	Karnataka	22.2	18.8	17.9
14	Kerala	17.3	15.2	14.8
15	Madhya Pradesh	31	26.9	25.5
16	Maharashtra	20.7	16.7	16.3
17	Manipur	18.3	14.4	14.4
18	Meghalaya	28.3	24.1	23.7
19	Mizoram	15.7	16.6	16.2
20	Nagaland	16.1	16.1	14.8
21	Odisha	23.5	20.1	19.2
22	Punjab	21.2	16.2	15.2
23	Rajasthan	31.1	26.2	24.8
24	Sikkim	21.6	17.6	17.0
25	Tamil Nadu	19.1	15.9	15.2
26	Tripura	16.1	14.3	14.7
27	Uttar Pradesh	32.1	27.8	26.7
28	Uttarakhand	18.5	18.9	17.8
29	West Bengal	20.6	16.3	15.5
30	India	25.4	21.8	20.8

Source: Sample Registration System, 2001, 2011, 2015.

The crude birth rate in India among different states over a period of 15 years at different time intervals - 2001, 2010 and 2015 reveals that there is a decline in the crude birth rate in all the states of India. In India overall crude birth rate slipped down from 25.4 in 2001, 21.8 in 2011 and 20.8 in 2015, the states like Uttar Pradesh it was of the order of 32.1 in 2001, 27.8 in 2011, 26.7 in 2015, Bihar 31.2 in 2001, 27.7 in 2011, 26.3 in 2015, in Madhya Pradesh 31.2 in 2001,

27.7 in 2011, 26.3 in 2015, Rajasthan 31.1 in 2001, 26.2 (2011) and 24.8 (2015). The birth rate in India declined due to the socio economic developments and intensive implementation of family planning programmes. Since urban women are more educated they enjoy higher incomes, and have better access to family planning services. Higher levels of birth rate are mostly in rural phenomenon.

### **CRUDE DEATH RATE**

The death rate is defined as the number of death per 1000 estimated midyear population in one year. The crude death rate is the number of deaths occurring among the population of a given geographical area during a given year, per 1,000 mid-year total population of the given geographical area during the same year. The death rate in India is declining due to proper medical facilities, technology, hospital services and infrastructure facilities etc,. The crude death rate of different states in India are given in Table 7.

**TABLE 7**  
**CRUDE DEATH RATE**

S.NO	STATES	2001	2011	2015
1	Andhra Pradesh	8.2	7.5	7.1
2	Arunachal Pradesh	5.7	5.8	6.0
3	Assam	9.6	8.0	7.1
4	Bihar	8.2	6.7	6.2
5	Chattisgarh	8.8	7.9	7.5
6	Delhi	5.1	4.3	3.6
7	Goa	7.7	6.7	6.4
8	Gujarat	7.8	6.7	6.1
9	Haryana	7.6	6.5	6.1
10	Himachal Pradesh	7.1	6.7	6.6
11	J & K	6.1	5.5	4.9
12	Jharkhand	8.8	6.9	5.8
13	Karnataka	7.6	7.1	6.6
14	Kerala	6.6	7.0	6.6
15	Madhya Pradesh	10.1	8.2	7.5
16	Maharashtra	7.5	6.3	5.8
17	Manipur	5.2	4.1	4.0
18	Meghalaya	9	7.8	7.4
19	Mizoram	4.4	4.4	4.2
20	Nagaland	3.3	3.3	3.0
21	Odisha	10.4	8.5	7.6
22	Punjab	7	6.8	6.2
23	Rajasthan	8	6.7	6.3
24	Sikkim	5.1	5.6	5.0
25	Tamil Nadu	7.7	7.4	6.7
26	Tripura	5.6	5.0	5.2
27	Uttar Pradesh	10.1	7.9	7.2
28	Uttarakhand	7.8	6.2	6.4
29	West Bengal	7	6.2	5.9
30	India	8.4	7.1	6.5

**Source: Sample Registration System, 2001, 2011, 2015.**

The crude death rate in India has dropped from 8.4 in 2001, 7.1 in 2011 and further to 6.5 in 2015. The states like Odisha witnessed death rate with 10.4 in 2001, 8.5 in 2011 and 7.1 in 2015. In Madhya Pradesh it is about 10.1 in 2001, 8.2 in 2011, 7.5 in 2015, Uttar Pradesh it is 10.1 in 2001, 7.9 in 2011, 7.2 in 2015, Assam it is 9.6 in 2001, 8.0 in 2011 and 7.1 in 2015, Chattisgarh it is 8.8 in 2001, 7.9 in 2011, 7.5 in 2015, Jharkhand it is 8.8 in 2001, 6.9 in 2011, 5.8 in 2015, Bihar it is 8.2 in 2001, 6.7 in 2011, 6.2 in 2015, Tamil Nadu it is 7.7 in 2001, 7.4 in 2011, 6.7 in 2015. The death rate declined due the availability of infrastructure facilities,

improvement in medical facility, technological treatments, etc., which has promoted the health status in India. The awareness of the public with regard to protection and prevention played a great deal in bringing down death rate. There are lots of vaccines available in the present day to protect individuals spring into action to take the help of medical facilities and continue the treatment. Availability and accessibility of health care to people result in lowering the death rate. In Table 7 one could observe variation in death rate among different states during 2001 but by 2015 this has reduced to a great extent. This speaks of the tremendous advancement in health care facilities made available by the government and the readiness of the general public to accept and adopt it.

### **INFANT MORTALITY RATE (IMR)**

Infant Mortality Rate is defined as the number of infant deaths per 1000 of live births during one year. The Infant mortality rate is also called infant death rate. In the past Infant mortality claimed a considerable percentage of children born, but the rates have significantly declined in modern times mainly due to improvements in basic health care, through technology and medical achievements. Infant mortality rate is commonly included as a part of standard of living evaluation in economics. The Infant Mortality Rate still remains an important public health indicator of the socio-economic development of a country. India is facing severe problems related to the infant mortality. Infant mortality is a major health problem and government is more concerned towards solving such health problem by reducing infant mortality rate. Further, the reasons for infant mortality include socio-cultural beliefs, education of mother, regular health check-up, lack of proper health care facilities, etc (Krishna et.al.,2016) The following Table 8 explains the Infant Mortality Rate in different states in India.

**TABLE 8**  
**INFANT MORTALITY RATE**

S.NO	STATES	2001	2011	2015
1	Andhra Pradesh	19	43	37
2	Arunachal Pradesh	34	32	30
3	Assam	11	55	47
4	Bihar	23	44	42
5	Chattisgarh	20	48	41
6	Delhi	41	28	18
7	Goa	25	11	9
8	Gujarat	29	41	33
9	Haryana	28	44	36
10	Himachal Pradesh	52	38	28
11	J & K	26	41	26
12	Jharkhand	22	39	32
13	Karnataka	32	35	28
14	Kerala	30	12	12
15	Madhya Pradesh	35	59	50
16	Maharashtra	41	25	21
17	Manipur	38	11	9
18	Meghalaya	43	52	42
19	Mizoram	44	34	32
20	Nagaland	44	21	12
21	Odisha	55	57	46
22	Punjab	57	30	23
23	Rajasthan	59	52	43
24	Sikkim	57	26	18
25	Tamil Nadu	21	22	19
26	Tripura	22	29	20
27	Uttar Pradesh	48	57	46
28	Uttarakhand	39	36	34
29	West Bengal	36	32	26
30	India	44	44	37

Source : Sample registration system, 2001, 2011, 2015.

The infant mortality rate has falling trend during the period of 2001, 2011 and 2015 respectively. All India level has secular fall in the IMR from 44 in 2001 to 37 in 2015 per 1,000 live births. In states like Odisha it fell from 55 in 2001 to 46 in 2015, for Punjab the decline was from 57 in 2001 to 23 in 2015, Rajasthan 59 in 2001 to 43 in 2015, Sikkim from 57 to 18 in

2015, Uttar Pradesh from 48 in 2001 to 46 in 2015, Uttarakhand is about 39 in 2001 to 34 in 2015. In West Bengal the decline was about 36 2001 to 26 in 2015, Bihar experienced a rise from 23 in 2001 to 40 in 2015 while Tamil Nadu it declined from 21 in 2001 to 19 in 2015. In Delhi it was 41 in 2001 which declined to 18 in 2015, Goa is about 25 in 2001 to 9 in 2015. The infant mortality is decreased due to education of mother, regular health check-up, proper health care facilities, etc., this leads to health and development. Though there is a declining trend of IMR to achieve the millennium development goals India has to work harder in health sector. Percentages of health expenditure need a boost to trickle down and uplift all other indicators of health status in India.

## **HEALTH INFRASTRUCTURE**

Infrastructure is defined as “physical framework of facilities through which goods and services are provided to the public”. The infrastructure required in accelerating the pace of economic development constitutes both economic and social elements. The economic infrastructure is that which directly facilitates the production process. Transport, communication, energy, irrigation, banking etc. are the services comprising of economic infrastructure. The social infrastructure, on the other hand, has an indirect impact on the production process by developing an efficient and productive human resource. It includes education, health, housing, water supply, sewage disposal, sanitation etc. All these help in the attainment of higher growth and also improvement in the quality of life of the people as well. The better transport and communications provide improved access to health services. Electrification improves the quality of life including health services. Especially, social infrastructure has a much prominent role to play as compared to its counterpart.

Health infrastructure in terms of hospitals, hospital beds, doctors, nurses, pharmacists etc., has a significant direct and positive contribution to the health outcomes of any country. Health infrastructure is an important indicator to understand the health care delivery provisions and mechanisms in a region. It signifies the investments and priority accorded for creating the infrastructure in public and private sectors. It is very essential to take necessary steps to provide health infrastructure facilities to all the states that inequality in case of health status and health care can be removed. Only the selected indicators like number of hospitals, number of beds,

number of doctors, etc., were considered for this study. The following section highlights the importance and trends of these indicators in India during the reference periods.

## **NUMBER OF HOSPITALS PER 000' POPULATION**

Hospitals are health care institutions that have an organized medical and other professional staff, and inpatient facilities, and deliver services 24 hours per day, 7 days per week (WHO). They offer an varying range of acute convalescent, and terminal care using diagnostic and curative services. Hospital is an institution providing medical and surgical treatment and nursing care for sick or injured people. Hospitals are the primary unit to avail health facilities. There are number of hospitals that provide health facilities to the public. Health is a merit good and therefore this good is provided by both private and public institution. After Independence, India has built up health Infrastructure and manpower at primary, secondary and territory level (Ray, 2003; Bhat and Babu, 2004). Large investments in health care infrastructure are being directed towards modern public hospitals and health facilities. In healthcare, health outcomes play a crucial role in determining quality. However, the importance of customer experience and customer delight cannot be underestimated. Hospitals and Healthcare institutions have consistently focused on improving the patients experience and providing services in timely and orderly fashion. However it is often difficult to rate the quality of services (both clinical and non clinical), using similar indicators. For a hospital or a healthcare institution, it is imperative to understand the components which can influence the overall quality of medical care services. Quality hence can be understood based on their overall implication on health outcomes of the patients. The various components that impact the health outcomes and thereby influence quality include, Comprehensive and integrated services, based on the demand, with adequate infrastructure and logistics. Building, equipments, water supply, sanitation, power, etc., play a crucial role and considerably influence quality of medical care. Manpower skills, knowledge, qualification, technical knowhow, training and their availability is also critical for improving the healthcare outcomes and hence enhancing quality. An information system helps retrieve data and information easily and also aids in planning for expansion and need based requirement of the population. Quality is affected by the nature and comprehensiveness of the information system, which helps identify existing lacunae and take corrective action. Availability of safe and effective drugs, technology and medications directly impact on the health outcome and should be

considered as an integral part of quality. Accountability improves health outcomes and hence enhances quality. Effective and efficient governance is a cornerstone to ensure quality medical care services . Finally, cost effectiveness plays a crucial role. Quality can be acceptable only if it affordable for the general population(Utkarsh, 2011). The following Table 9 gives an account of the number of hospitals during the study period.

**TABLE 9**  
**NUMBER OF HOSPITALS PER 000' POPULATION**

S.NO	STATES	2001	2011	2015
1	Andhra Pradesh	521	475	278
2	Arunachal Pradesh	45	161	212
3	Assam	100	153	1137
4	Bihar	101	230	1436
5	Chattisgarh	138	218	637
6	Delhi	105	126	109
7	Goa	20	17	31
8	Gujarat	503	445	385
9	Haryana	133	154	159
10	Himachal Pradesh	141	150	160
11	J & K	76	92	2812
12	Jharkhand	47	500	549
13	Karnataka	723	919	654
14	Kerala	189	446	1278
15	Madhya Pradesh	324	457	451
16	Maharashtra	11701	1366	585
17	Manipur	28	225	30
18	Meghalaya	30	39	40
19	Mizoram	20	27	36
20	Nagaland	48	48	53
21	Odisha	406	1750	1750
22	Punjab	160	213	240
23	Rajasthan	510	826	3145
24	Sikkim	7	33	33
25	Tamil Nadu	424	581	788
26	Tripura	26	32	122
27	Uttar Pradesh	294	861	831
28	Uttarakhand	36	695	695
29	West Bengal	642	654	1566
30	India	7008	11993	20306

Source: Directorate general of state health service, Health and Family Welfare

The above Table 9 reveals the growth in the number of hospitals in various states. During 2014-15, the state of Rajasthan had the maximum number of hospitals with 3145 followed by Jammu and Kashmir with 2812 and further the third place in terms of number of hospitals with 1750 was for Odisha. Also states like West Bengal, Bihar Kerala and Assam witnessed increases in number of hospitals. These above mentioned states/ Union Territories had a speedy growth in terms of number of hospitals, where in Rajasthan had only 510 hospitals in 2001, this rose to 826 in 2011 and further to 3145 in 2014-15. For Jammu and Kashmir it was 76 in 2001 but by 2014-15 there was phenomenal increase to 2812. So also is the case with Assam and Bihar, which was around 100 in 2001 rose to more than 1000 by 2014-15. This is because of the effort of the government in establishing more hospitals. Further the private medical institution are also coming up to provide health facilities. More than the public institution it is the private which has created a mark in the field of health.

#### **NUMBER OF BEDS PER 000' POPULATION**

A hospital bed or hospital cot is a bed specially designed for hospitalized patients or others in need of some form of health care. These beds have special features both for the comfort and well-being of the patient and for the convenience of health care workers. A hospital bed is a bed specially designed for hospitalized patients or others in need of some form of health care. While the term "hospital bed" can refer to the actual bed, the term "bed" is also used to describe the amount of space in a health care facility, as the capacity for the number of patients at the facility is measured in available "beds." These beds have special features both for the comfort and well-being of the patient and for the convenience of health care workers. Common features include adjustable height for the entire bed, the head and the feet, adjustable side rails and electronic buttons to operate both the bed and other nearby electronic devices. Hospital beds and other similar types of beds are used not only in hospitals, but in other health care facilities and settings, such as nursing homes, assisted living facilities, outpatient clinics and in home health care. The number of hospital beds for different states in India are mentioned below the Table 10.

**TABLE 10**  
**NUMBER OF BEDS PER 000' POPULATION**

S.NO	STATES	2001	2011	2014-2015
1	Andhra Pradesh	35021	38050	19848
2	Arunachal Pradesh	2166	2218	2313
3	Assam	3000	7622	13381
4	Bihar	3030	18516	11552
5	Chattisgarh	5565	9428	12012
6	Delhi	20368	43109	24383
7	Goa	2639	2609	3118
8	Gujarat	35056	193210	27928
9	Haryana	7118	7879	7664
10	Himachal Pradesh	7786	8479	8776
11	J & K	3295	3945	9760
12	Jharkhand	1410	5414	5414
13	Karnataka	41304	63741	53022
14	Kerala	25839	31960	38400
15	Madhya Pradesh	17702	28533	28187
16	Maharashtra	76447	67954	163865
17	Manipur	670	1385	1427
18	Meghalaya	2157	2837	3127
19	Mizoram	1169	1430	1630
20	Nagaland	2060	2150	2427
21	Odisha	13146	15814	16683
22	Punjab	8973	10423	11804
23	Rajasthan	32080	25990	46669
24	Sikkim	730	1560	1560
25	Tamil Nadu	43567	47198	64243
26	Tripura	2231	3032	4137
27	Uttar Pradesh	8820	56384	NA
28	Uttarakhand	1080	7965	7965
29	West Bengal	58516	71191	78566
30	India	469672	784940	

Source: Directorate general of state health service, Health and Family Welfare

The above table reveals the growth in the number of hospital beds in various states and during 2014-15, the states of Maharashtra had the maximum number of hospital beds with 163865 followed by West Bengal with 78566 and further the third place in terms of number of hospital beds is for Tamil Nadu with 64243. Also states like West Bengal, Karnataka, Rajasthan, Kerala and Madhya Pradesh witnessed increases in number of hospital beds. These above

mentioned states had a speedy growth in terms of number of hospital beds, where in Maharashtra had only 76447 hospital beds in 2001, this sloped to 67954 in 2011 and but rose to 163865 in 2014-15. For West Bengal it was 58516 in 2001 but by 2014-15 there was phenomenal increase to 78566. So also is the case with Manipur and Mizoram, which was around 700 in 2001 rose to more than 1000 by 2014-15. The increase in health expenditure results in increase in health care facilities, even though there is increase in health facilities it is not enough because of increase in population.

### **NUMBER OF DOCTORS PER 000' OF POPULATION**

Doctor is a person who is qualified to treat people who are ill. Doctors examine, diagnose and treat patients who have been referred to the hospital and other health professionals. They apply medical knowledge and skills to the diagnosis, prevention and management of disease. Doctors work within a number of specialties. Doctors make important contribution to the management and leadership of health services and the delivery of healthcare. All doctors have some responsibilities for using resources; many will also lead teams or be involved in supervising colleagues. The primary duty of all doctors is for the care and safety of patients, Moreover the doctor patient ratio in rural areas of India is 1:20,000, while the urban ratio is 1:2,000 against the statutory 1:250 ratio from WHO for which India requires 6,00,000 doctors, (Gendral Medical Council, 2013). The following Table 11 describes the number of doctors per 1000 population in different states of India.

The Table 11 reveals the number of doctors in various states/ Union Territories. During 2014-15, the state of Uttar Pradesh had the maximum number of doctors with 10798 followed by Delhi with 9121 and further the third place in terms of number of doctors is for West Bengal with 8829. Also states like Rajasthan, Tamil Nadu, Karnataka, and Kerala witnessed increase in number of doctors. These above mentioned states/ Union Territories had a speedy growth in terms of number of doctors and this is particularly spectacular Uttar Pradesh which had only 812 doctors in 2001, this rose to 10164 in 2011 and further rose to 10798 in 2014-15. For Delhi it was 3629 in 2001 but by 2014-15 there was phenomenal increase to 9121. So also is the case with Sikkim and Mizoram which was around 200 in 2001 rose to more than 300 by 2014-15.

**TABLE 11****NUMBER OF DOCTORS PER 000' OF POPULATION**

<b>S.NO</b>	<b>STATES</b>	<b>2001</b>	<b>2011</b>	<b>2015</b>
1	Andhra Pradesh	5758	7413	4414
2	Arunachal Pradesh	416	411	418
3	Assam	2160	3844	4401
4	Bihar	NR	3979	3576
5	Chattisgarh	NR	1171	1008
6	Delhi	3629	3629	9121
7	Goa	674	312	516
8	Gujarat	2712	2282	3600
9	Haryana	1920	2764	2618
10	Himachal Pradesh	NA	4919	4919
11	J & K	2514	2185	3589
12	Jharkhand	1234	1701	1656
13	Karnataka	4490	4928	4606
14	Kerala	3519	5309	5214
15	Madhya Pradesh	NR	4076	4929
16	Maharashtra	5061	4528	4217
17	Manipur	856	714	814
18	Meghalaya	447	649	601
19	Mizoram	231	439	315
20	Nagaland	354	327	437
21	Odisha	4860	3922	4296
22	Punjab	3346	3545	3121
23	Rajasthan	5021	7872	7877
24	Sikkim	178	373	268
25	Tamil Nadu	2893	2676	7178
26	Tripura	761	827	1050
27	Uttar Pradesh	6766	10164	10798
28	Uttarakhand	812	1121	1242
29	West Bengal	5818	10854	8829
30	India	67576	97648	106415

Source: Directorate general of state health service, Health and Family Welfare

**NATIONAL STATE DOMESTIC PRODUCT**

National State Domestic Product is defined as a measure, in monetary terms, of the volume of all goods and services produced within the boundaries of the State during a given period of time after deducting the wear and tear or depreciation, accounted without duplication. Income which is considered to be an important determinant of economic growth has two way

relation with health. The level of income determines good health status and also contributes to increase in the level of income, as it is a critical factor for work force to be productive (Nobuhide Hatasa, 2005). The low expenditure states are also the states with relatively low per capita NSDP and have some of the poorest health indicators and infrastructure in the country.

**TABLE 12**  
**NATIONAL STATE DOMESTIC PRODUCT**

S.NO	STATES	2001	2011	2015
1	Andhra Pradesh	131,750	338164	228450
2	Arunachal Pradesh	1864	4725	5666
3	Assam	33668	65726	77394
4	Bihar	50579	117503	171802
5	Chattisgarh	25503	64977	78428
6	Delhi	55222	172235	225630
7	Goa	5492	192993	-
8	Gujarat	93455	315892	-
9	Haryana	54951	146053	192437
10	Himachal Pradesh	13938	31590	-
11	J & K	14185	32256	37453
12	Jharkhand	28500	76134	102196
13	Karnataka	92788	240817	301071
14	Kerala	66123	167178	-
15	Madhya Pradesh	71525	155701	222882
16	Maharashtra	217963	667625	852451
17	Manipur	2937	5862	-
18	Meghalaya	3651	9226	11203
19	Mizoram	1555	4539	116566
20	Nagaland	3380	8587	158877
21	Odisha	39678	99880	116566
22	Punjab	63995	129983	158877
23	Rajasthan	79936	185366	237530
24	Sikkim	881	4028	-
25	Tamil Nadu	123901	386508	458987
26	Tripura	5433	13215	-
27	Uttar Pradesh	162926	346621	427759
28	Uttarakhand	13179	47967	66653
29	West Bengal	139057	279191	356845
30	India	1764137	4348232	12,653,762

**Source: Directorate of Economics & Statistics of respective State Governments, and for All India.**

The above Table12 reveals the National state domestic product of different states in India at different time period of 2001, 2011 and 2015. There is increase in National state domestic product from 17,64,137 in 2001 to 43,48,232 in 2011 and further to 12,653,762 in 2015. In states like Uttarakhand it is 139057 in 2011 which rose to 666531 in 2015 followed by Jharkhand it is 28500 in 2001, 76134 in 2011 and 102196 in 2015, Andhra Pradesh it is 1039 in 2001, 7200 in 2011 and 8600 in 2015. The other states like Tripura, Tamil Nadu, Punjab, Gujarat, Haryana which around 60 to 70 per cent and also the states like Bihar, Jharkhand, Uttar Pradesh are considered to be lower with 20 to 30 per cent of National state domestic product.

### **HEALTH EXPENDITRE IN INDIA**

Health expenditure is a total expenditure in an economy by both government and private citizens on health related matters. It usually includes expenditure on healthcare. For improved Health care investment on education, housing, old age security and other social provisions is essential. Effective contribution and the active participation of the government are essential. Even in the most advanced countries, the role of the government has been extremely critical in assuring that health care becomes universally and more or less equitable. Investment in health care is a necessary social investment without which the large mass of working classes cannot realize good health and contribution to the economy. Public expenditure on health of the state governments is taken as an dependent variable, (Hooda, 2013). This includes the expenditure on medical, public health, family welfare, water supply and sanitation. The share of public expenditure as a percentage to GDP on health and education at higher level has been gradually declining (Panchamukhi, 2000). The health sector, therefore, faces dual challenge: while control of communicable and non-communicable diseases is of paramount importance, the budget allocation by the government is on the gradual decline in recent years. Hence, India faces the daunting challenge of meeting health care needs of its vast population and ensuring accessibility, efficiency, equity and quality of healthcare and thereby achieving the objective of growth with equality and social justice.

Health care expenditure is a very necessary social expenditure for any country. Whether it is a developing country or a developed one, state's role in developing a good health to everybody becomes very critical and important. The major factor influencing health is per capita health expenditure, that government is spending around four per cent of GDP in India. The

developed countries on the other hand spend 8 to 12 per cent of GDP on health, such as France (11.5 Per cent), Germany (11.3 Per cent), and Australia (9.4 Per cent) in the year 2015 (Government of India, World Bank, 2015). Higher levels of health expenditure are generally associated with higher levels of health status. The demand for health services is bound to increase share of old age groups in the country (Chopra, 2011). Older people are usually prone to diseases and require services for the specific needs of their age group. The rapid ageing of the population in the region, in particular the older population (more than 60 years) would increase expenditure on public health, for two reasons. First older people and, in particular, those of advance age, are more prone to disease. The older population group is expected to expand more during the coming years and is bound to increase the demand for health services in large scale. Second, health care for older person is on an average more expensive than the children and younger people. The public expenditure on health actually declined over the past decades. Health expenditure is a major determinant of the health status of the people in a country. When the government decides to spend more on health, the citizen would be able to enjoy better health and thereby it improves the overall economic development. The relation between health and economic development is well documented in several studies and it has been observed that advanced economies contribute more towards health, while the developing economies are well below them and there is a great gap in the health status of the people. In the case of India allotment to health sector is very low or poor and the trickle down effects are also disappointing. However the government is taking effort to increase its share on health. The Table 13 below portrays the health expenditure in India for three different time periods.

**TABLE 13****HEALTH EXPENDITRE IN INDIA****(Rs in Crores)**

<b>S.No</b>	<b>States</b>	<b>2001</b>	<b>2011</b>	<b>2015</b>
1	Andhra Pradesh	7979	8430	7384
2	Arunachal Pradesh	1486	1670	2830
3	Assam	1526	2176	1539
4	Bihar	6516	4552	2566
5	Chattisgarh	2530	1706	1315
6	Delhi	1461	1123	2734
7	Goa	2041	3283	4250
8	Gujarat	4166	5127	4675
9	Haryana	3344	2447	1721
10	Himachal Pradesh	7990	9602	1097
11	J & K	1084	1072	1205
12	Jharkhand	3963	1435	1010
13	Karnataka	3789	4594	4042
14	Kerala	5957	9697	3244
15	Madhya Pradesh	5252	5107	3342
16	Maharashtra	9868	1243	6433
17	Manipur	1,400	1526	3320
18	Meghalaya	1198	2168	3990
19	Mizoram	8387	1053	2250
20	Nagaland	2,440	1705	3760
21	Odisha	21,59	3456	1810
22	Punjab	3754	3477	2047
23	Rajasthan	3396	4615	3939
24	Sikkim	5611	8532	2450
25	Tamil Nadu	5317	8089	5484
26	Tripura	2545	4975	3180
27	Uttar Pradesh	1881	1738	8798
28	Uttarakhand	1523	7373	9660
29	West Bengal	6257	1056	4096
30	India	103249	130726	159492

**Source: National Health Profile**

The overall the health expenditure in India was Rs 103249 Crores in 2001, which increased to Rs 130726 Crores in 2011 and further to Rs 159492 Crores in 2015. The states like Uttarakhand it is of the order of Rs 1523 Crores in 2001, this rose to Rs 7373 Crores in 2011 and Rs 9660 Crores in 2015 followed by Uttar Pradesh Rs 1881 Crores in 2001, Rs 1738 Crores in 2011 and Rs 8798 Crores in 2015 and further the third place was occupied by Andhra Pradesh

with Rs 7384 Crores in 2015. The states like Maharashtra, Tamil Nadu, Karnataka, and Kerala witnessed increase in health expenditure. So also is the case with Assam, Chhattisgarh, Haryana, Himachal Pradesh, Jharkhand, Odisha which was around 1000 in 2014-15. Even though there is increase in health expenditure it is not enough to provide healthcare facilities because of increase in population. The health expenditure is very low in India compared to other countries. It affects the health status of the people while a majority cannot afford for treatment in private sector, the government should take efforts to increase the share on health sector which can be translated to various awareness of health care services resulting in easy accessibility to the poor.

## **PUBLIC EXPENDITURE ON HEALTH AND ITS IMPACT OF ECONOMIC GROWTH**

Health is a primary and essential input for human resource development of a country. A chronically sick person, in spite of high income and education cannot enjoy life and would contribute very little to the society. The health of population and individual is inextricably bound up with development. Overcoming health related barriers to the accumulation of human capital might be an important pre condition for achieving higher income level. Therefore, the expenditure on health is not only a means to the welfare of the society but also an end to the economic development. Investment in the health of people is considered to be a development strategy. A comparison of health indicators with economic indicators at a country level shows that the countries whose inhabitants enjoy the highest life expectancy tend to be those with the highest income per person.

Net Domestic Product (GDP) is an economic indicator used to measure the production in a given country. It is defined as the total value of the production of richness's (value of the goods and services created value of the goods and services destroyed or transformed during the production process) in a country given during one year given by the economic agents residing inside the own territory. It is also the measurement of the income coming from the production in a given country.

Although, healthcare expenditures are ordinarily hypothesized to be a function of real per capita gross domestic product (GDP), there are some reasons to suggest this could be a bilateral relationship, as it can be reasoned to health is an input to the macroeconomic production function. There are some reasons why a bilateral relationship between healthcare expenditures and real per capita income could exist. First, by definition, health expenditures are a function of

resources available (income or wealth). Second, a reverse causation income as a function of health expenditures also has a theoretical basis due to the fact that the latter is a determinant of human capital, and labor supply and productivity. If health expenditure can be regarded as an investment in human capital, and given that human capital is an “engine” of growth, an increase in health expenditure must ultimately lead to higher income achievements. Similarly, rise in health expenditures make possible higher labor supply and productivity, which eventually must give way to a higher income. Many factors influence the economic growth process. These include internal development policies, political stability, domestic capital formation, development of human capital, banking and financial infrastructure, export policies, foreign direct investment, and foreign aid. It can be stated that capital accumulation is a key determinant of growth, particularly for developing countries hence, some part of growth is determined through education and health status that reflect society’s human capital accumulation. For this reason, the issue of health expenditures and economic growth used as an indicator of human capital is still important. On the other hand, the basic economic problem specific to emerging market economies is to ensure rapid and stable economic growth. Therefore, sustainability of economic growth is another point of argument for emerging economies in order to become developed and maintain their positions. Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own. It is possible to identify three different concepts of sustainable development: the economic, the ecological and the socio cultural. A socially sustainable system must achieve distributional equity, adequate provision of social services including health and education, gender equity, and political accountability and participation. So, it can be thought that health care expenditures have implications both for current value of human capital and for the long run sustainable growth. In this regard, alternative politics are among the frequently argued issues, both by economists and politicians. In this study, the aim is to investigate whether there is a relationship between healthcare expenditures and economic growth.

## **HEALTHCARE EXPENDITURE**

Net domestic product of India measured at constant prices is steadily growing over the years. Any rise in the NDP should also lead to rise in the health expenditure. India’s public health expenditure as a percentage of GDP is just above 1 per cent of the GDP for public health

care while the allocation to this sector stands at 2 per cent for the least developed countries (UN classification). Most of the economies such as Australia, United States, United Kingdom and so on, contribute above 6 per cent, while India being a mixed economy and having the aid of public

According to the Indian Constitution, the health sector falls under the concurrent list and thus, the provision of public healthcare in India is a responsibility shared by both the Central and State governments. Healthcare expenditures of states of India at constant prices shows a clear rise in the health expenditure. Though the expenditures in health have increased gradually, they have failed to rise in proportion to the needs of the increasing population. Among the states, Odisha stands at the least position in terms of Net state domestic product followed by Bihar, Haryana, Madhya Pradesh, Punjab and Rajasthan. The situation has even worsened in the years 2004-05 and 2005-06. It showed very little growth.

Meanwhile, Haryana has started and ended as the state allocating least expenditure in favor of health care facilities. And in this, it has consistently been lagging behind, to be beaten only by Odisha. An important point that emerges from the above inferences is that there is very wide variation across states and further, these gaps have actually widened over time. And Haryana's neighboring state Punjab, with the highest per capita next only to Delhi runs close. Though it did show a little growth in the initial years, it gradually dropped by near its starting expenditures of 1996- 97. The decadal health expenditure growth of Punjab can thus be noted negligible. The states Kerala and Gujarat move along similar paths of public health expenditure and in spite of a huge margin between Kerala and Gujarat in successful implementation both rank in consecutive positions, Kerala topping Gujarat with the aid of highly literate population and cost effective measures of health care system. Both Kerala and Gujarat suffer from the same urban- rural division problem hampering their growth. The annual rate of growth of the total health budget of the states, measured in constant prices. It shows that increases in state government health expenditure have generally been below the rate of growth of aggregate real GDP.

The relationship between health care expenditure and economic growth on the states based on an annual data series from the period 2001, 2011 to 2015 were studied. The necessary information collected from various sources were analyzed. In economic literature, the concept of integrating series was introduced by Granger (1980, 81). The rationality behind co integration techniques is that if, in the long run, two or more series move closely together, even though the

series themselves are trended, the difference between them is constant. Mathematically, for  $Y_t$  and  $X_t$  (both I (1)) if there exists a constant ' $\alpha$ ' such that  $X_t - \alpha Y_t$  is I(0), then the two series are co-integrated with ' $\alpha$ ' as co integrating parameter.  $X_t = \alpha Y_t$  is the long run 'equilibrium' relation and sometimes termed as 'attractor' (Granger, 1988), and any deviation from this measures the degree to which the series are out of equilibrium. A lack of co integration suggests that such variables have no long-run relationship. The precondition for the co integration technique is the series  $X_t$  and  $Y_t$  should be stationary in the same order.

Co integrating regression are estimated by adopting the test procedures such as co integrating regression Durbin- Watson (CRIW) test, it requires the estimation of co integrating regression on the following equation:

$$y_t = \alpha + \beta X_t + U_t \text{ ----- (1)}$$

By using Ordinary least square method, residuals are obtained, and then Co integration Regression test is employed

In health economics, the direction of causality between economic growth and health expenditure is still under controversy. Whether growth leads to higher health expenditure or health expenditure causes growth is a million dollar question. Since from the seminal work of Newhouse, a large number of studies have been carried out to estimate the relationship between expenditure on health and economic growth. All these studies found a complex inter relationship that exists between health care expenditure and economic development. However, very few studies are conducted on the direction of causal relationship between health expenditure and growth. In Indian context, large number of studies are carried out on health care financing at both national and regional level. However, studies are not conducted pertaining to the causal nexus between health care expenditure and economic growth with special reference to Indian states. Therefore, an attempt is made here to investigate empirically the relationship between health care expenditure and economic growth in all the states in India. In the present study, variable 'y' is taken as economic growth and variable 'x' is considered as healthcare expenditure. Here health expenditure means only the expenditure what the states spend on public and medical health. The expenditure on family welfare programs and water and sanitation programs are excluded from health expenditure because both the programs are sponsored by the central government.

**TABLE 14****HEALTH EXPENDITURE AND NET STATE DOMESTIC PRODUCT**

<b>Year</b>	<b>Constant</b>	<b>R<sup>2</sup></b>	<b>AdjR<sup>2</sup></b>	<b>F-Value</b>	<b>D.W Statistics</b>
<b>2001</b>	1.459 (29.044)*	0.968*	0.967	843.543	2.184*
<b>2011</b>	-0.272 (23.448)*	0.952*	0.950	549.803	2.590*
<b>2015</b>	-0.268 (21.448)*	0.972*	0.970	642.803	2.250*

Source: Directorate of Economics & Statistics of respective State Governments and National Health Profile.

The above Table 14 examined the relationship between health expenditure and Net state domestic product of different states for three different years 2001, 2011, 2015. The regression result indicated that there is significant relationship between health expenditure and Net state domestic product where the R<sup>2</sup> value for 2001 is about 0.968, 2011 is about 0.952 and 2015 is about 0.972. The co integration regression equations are estimated. As a necessary for co integrating regression, the residuals are tested for co integration. Durbin-Watson statistic is used as an indicator for the existence of co integration between the variables studied. The Durbin-Watson statistic infers the stationary of residuals, which is nothing but the existence of co integration between the two series. For to test the stationary of the residuals obtained from co integrating equation, the test is employed.

The results of test show that lagged error coefficient are less than one and statistically significant at one percent levels. Hence, it can be concluded that health expenditure and economic growth in all states in India are co integrated. From the results, it can be seen that the health care expenditure and economic growth of Indian states are co integrated. Hence, these results revealed that there exists a unidirectional causality from health expenditure to economic growth in all states.

**PER CAPITA NATIONAL STATE DOMESTIC PRODUCT**

Given India's size and fact that health is a state subject, it is important to examine interstate differences in spending patterns while the central government provides funds to the states under centrally sponsored schemes based on uniform norms, per capita expenditure in states varies depending upon the prevalence of diseases and utilisation of funds allocated. If

these are taken into account, the central government expenditure does not show much variation between states. There are substantial variations in per capita expenditure on health by the states. At one end of spectrum are states like Bihar, Madhya Pradesh, Uttar Pradesh and Odisha with low per capita expenditure, poor access to health indices. However, Rajasthan and Assam continue to have poor health indices in spite of relatively higher expenditure, (Planning Commission, 2002).

**TABLE 15**

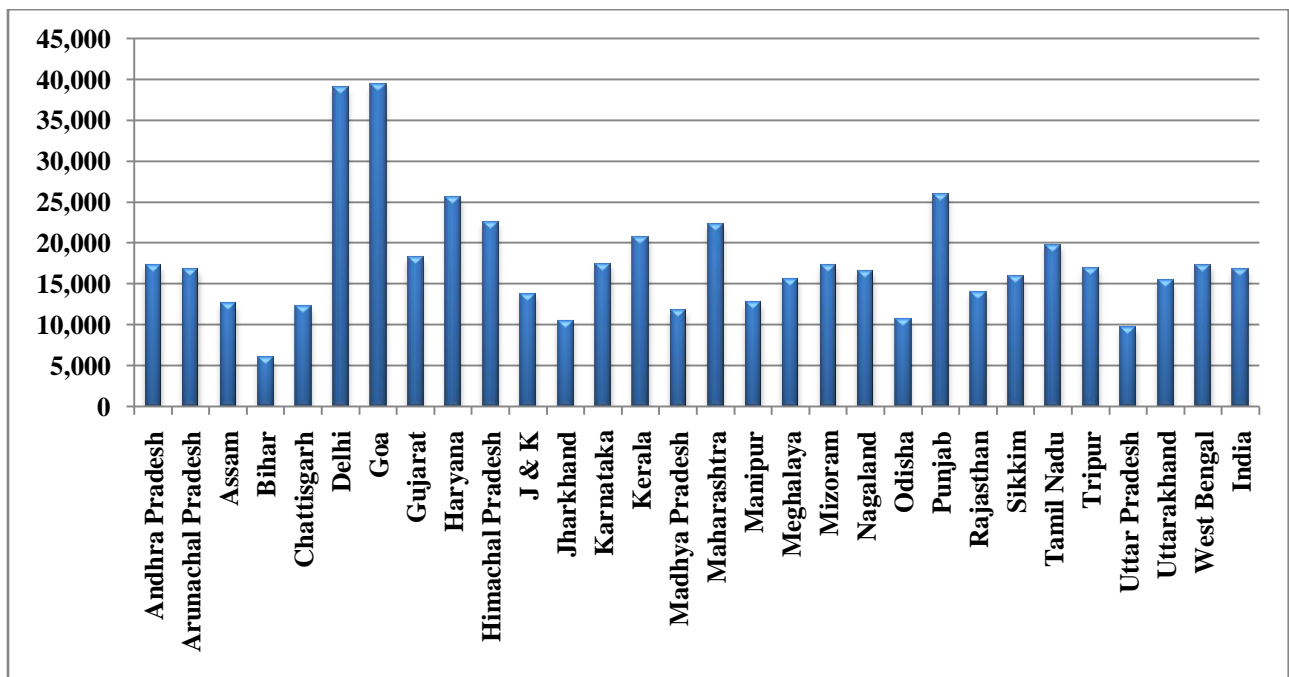
**PER CAPITA NATIONAL STATE DOMESTIC PRODUCT (Rs)**

S.NO	STATES	2001	2011	2014-2015
1	Andhra Pradesh	17,213	58733	90517
2	Arunachal Pradesh	16,793	60961	96199
3	Assam	12,529	33087	49480
4	Bihar	5,994	19111	36143
5	Chattisgarh	12,202	41165	64442
6	Delhi	39,026	145129	240849
7	Goa	39,339	168024	-
8	Gujarat	18,200	77485	-
9	Haryana	25,598	93852	147076
10	Himachal Pradesh	22,543	68297	-
11	J & K	13,784	40089	58888
12	Jharkhand	10,451	34721	52147
13	Karnataka	17,402	62251	101594
14	Kerala	20,681	69943	-
15	Madhya Pradesh	11,715	32453	59770
16	Maharashtra	22,258	84858	129235
17	Manipur	12,641	28336	-
18	Meghalaya	15,518	43766	69516
19	Mizoram	17,245	50956	-
20	Nagaland	16,540	55582	85544
21	Odisha	10,701	39537	59229
22	Punjab	25,992	69582	99578
23	Rajasthan	13,933	44644	72156
24	Sikkim	15,953	108972	-
25	Tamil Nadu	19,748	78473	128366
26	Tripur	16,947	46050	-
27	Uttar Pradesh	9,672	26698	40373
28	Uttarakhand	15,364	73819	115632
29	West Bengal	17,225	47245	78903
30	India	16,764	54021	-

Source: Directorate of Economics & Statistics of respective State Governments, and for All India.

The above Table 15 reveals the per capita health expenditure in varies states and union territories in 2001, 2011 and 2015. The states having higher per capita were Delhi Rs 39,026 in 2001, Rs 145129 in 2011and Rs 240849 in 2015, Haryana Rs25,598 in 2001, Rs93852 in 2011, Rs 147076 in 2015, Karnataka 17,402 in 2001, 62251 in 2011, 101594 in 2015 and Tamil Nadu 19,748 in 2001, 78473 in 2011, 128366 in 2015 and other better performing states are Uttarakhand, Andhra Pradesh, Punjab. Low performing states are Uttar Pradesh, Assam and Bihar.

**PER CAPITA NATIONAL STATE DOMESTIC PRODUCT 2001**



**FIGURE 1**

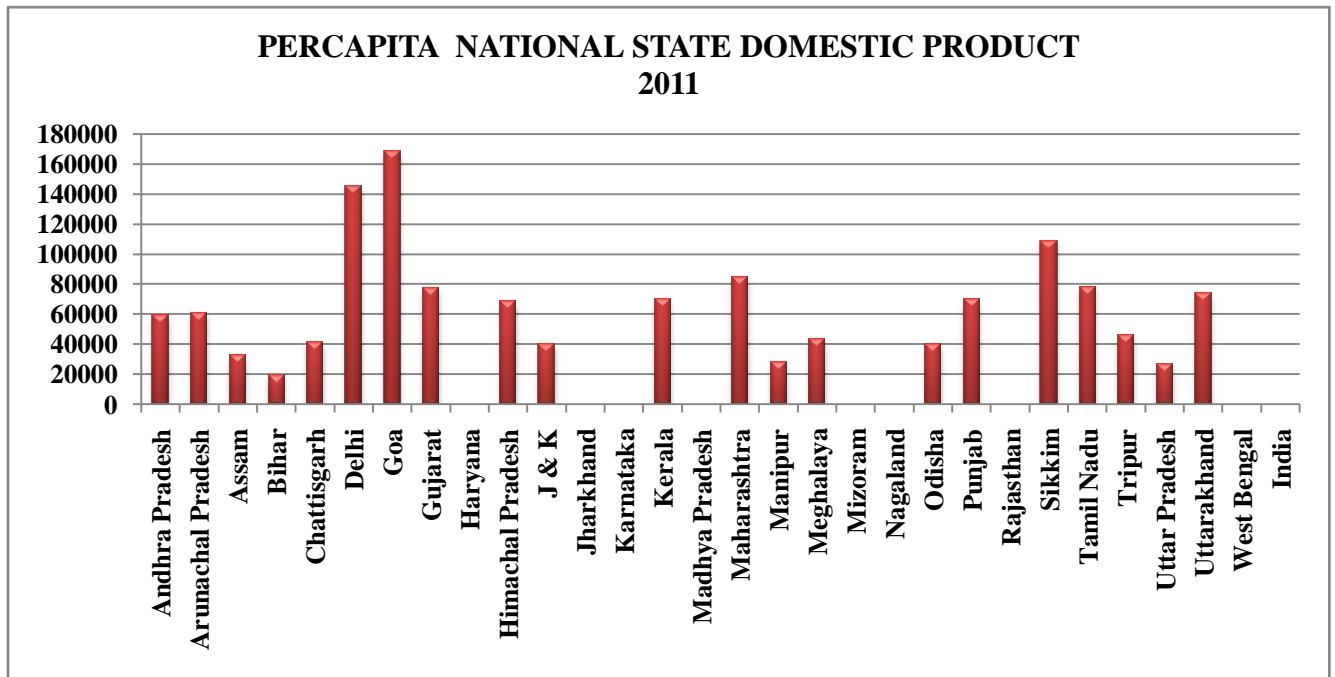


FIGURE 2

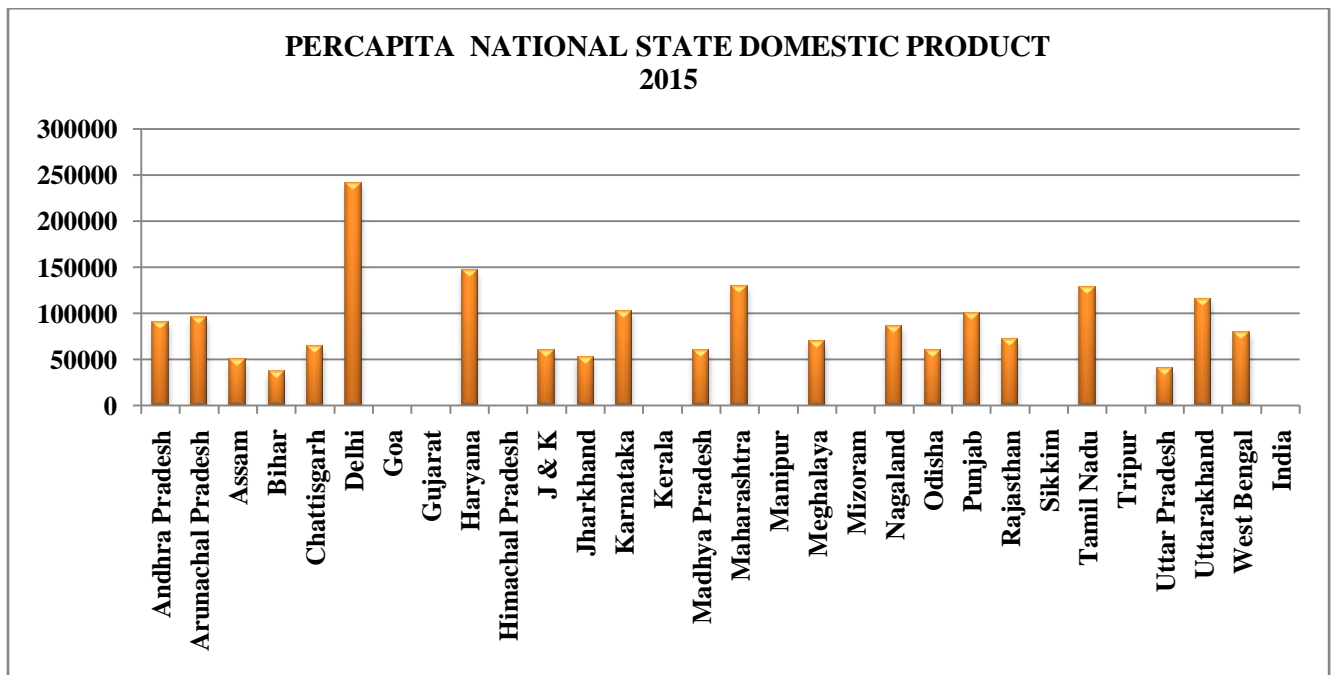


FIGURE 3

## **PER CAPITA HEALTH EXPENDITURE**

Per Capita Public Health Expenditure is defined as the sum of public and private health expenditure as a ratio of total population. Income (per capita GDP) has been identified as a very important factor for explaining differences across countries in the level and growth of total health care expenditures. Health and human development, in addition to per capita income, form an integral part of the overall socio economic development of a nation. However, compared with other developing countries, health status in India is not only below the level of all developing countries but has also shown a lower level of improvement. Moreover, there exists very high inequalities in per capita health expenditure. Given India's size and fact that health is a state subject, it is important to examine interstate differences in spending patterns. While the centrally sponsored schemes are based on uniform norms, per capita expenditure in states varies depending upon the prevalence of diseases and utilization of funds allocated. If these are taken into account, central government expenditure does not show much variation between states. There are substantial variations in per capita expenditure on health by states, as is depicted in the Table 16 below.

**TABLE 16****PER CAPITA HEALTH EXPENDITURE (Rs)**

S.No	States	2001	2011	2015
1	Andhra Pradesh	1039	720	860
2	Arunachal Pradesh	1,344	3460	2238
3	Assam	569	860	494
4	Bihar	779	1120	257
5	Chattisgarh	N.A.	700	531
6	Delhi	1,048	940	1507
7	Goa	1,504	1070	2307
8	Gujarat	816	570	777
9	Haryana	1,570	490	661
10	Himachal Pradesh	1,305	1740	1593
11	J & K	1,061	2260	1009
12	Jharkhand	N.A.	780	315
13	Karnataka	712	870	670
14	Kerala	1,858	880	929
15	Madhya Pradesh	864	870	452
16	Maharashtra	1,011	550	560
17	Manipur	642	1320	1334
18	Meghalaya	513	1750	1495
19	Mizoram	937	3280	2203
20	Nagaland	1,217	2490	1645
21	Odisha	582	980	439
22	Punjab	1,530	650	728
23	Rajasthan	597	980	568
24	Sikkim	1,030	3820	3933
25	Tamil Nadu	846	710	806
26	Tripura	790	1320	863
27	Uttar Pradesh	1,124	920	427
28	Uttarakhand	N.A.	1110	952
29	West Bengal	775	690	451
30	India	997	802	1280

Source: National Health Profile

There is decline in per capita health expenditure from Rs 997 in 2001 to Rs 802 in 2011 however in 2015 there was an increase to Rs 1280 in 2015 in states like Uttarakhand it is Rs 1110 in 2011 which rose to Rs 952 in 2015. In Kerala with Rs 1,858 in 2001 declined to Rs 880 in 2011 and but increased to Rs 929 in 2015. In Andhra Pradesh it is Rs 1039 in 2001, Rs 720 in 2011 and Rs 860 in 2015. The other states like Tripura, Tamil Nadu, Punjab, Gujarat,

Haryana it was around 60 to 70 per cent and also the states like Bihar, Jharkhand, Uttar Pradesh are considered to be lower 20 to 30 per cent of per capita health expenditure.

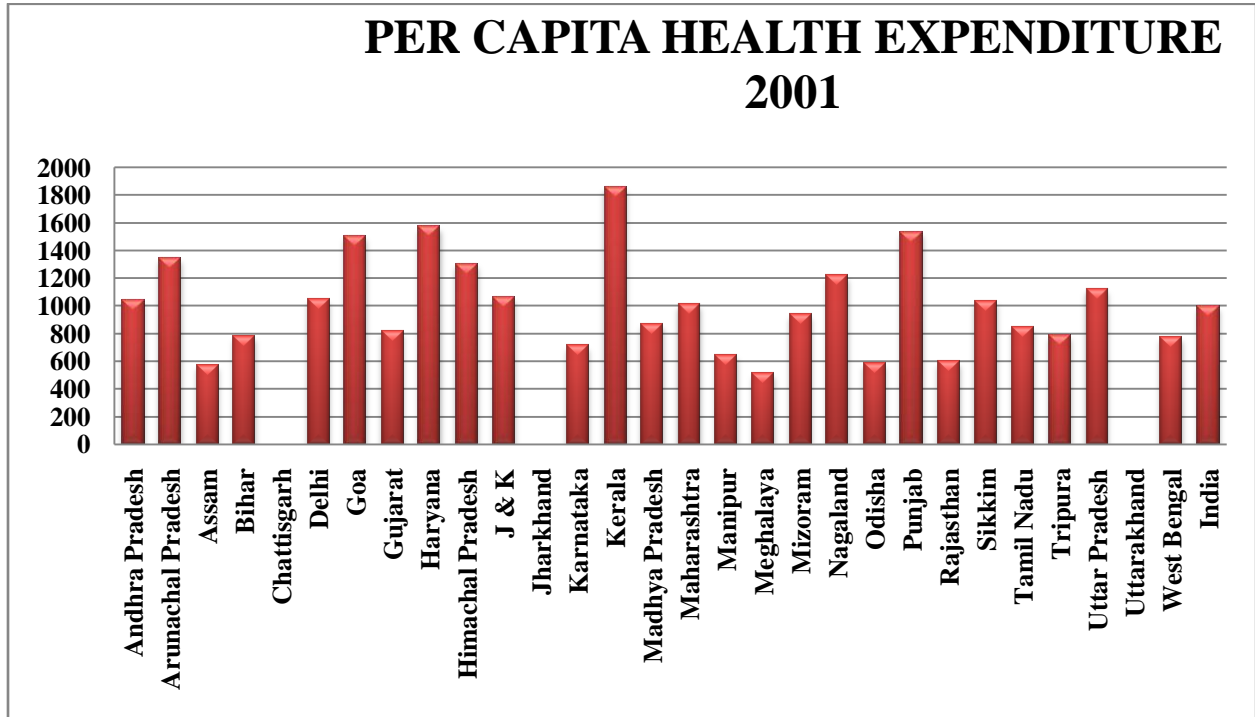


FIGURE 4

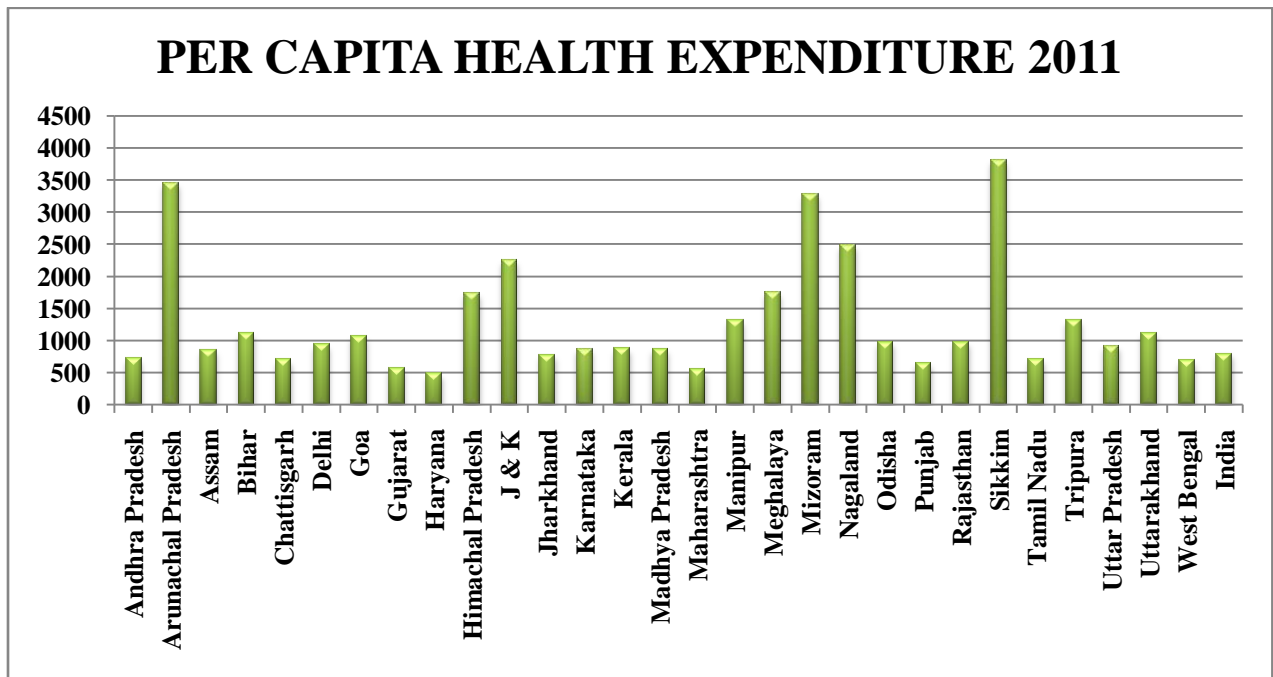


FIGURE 5

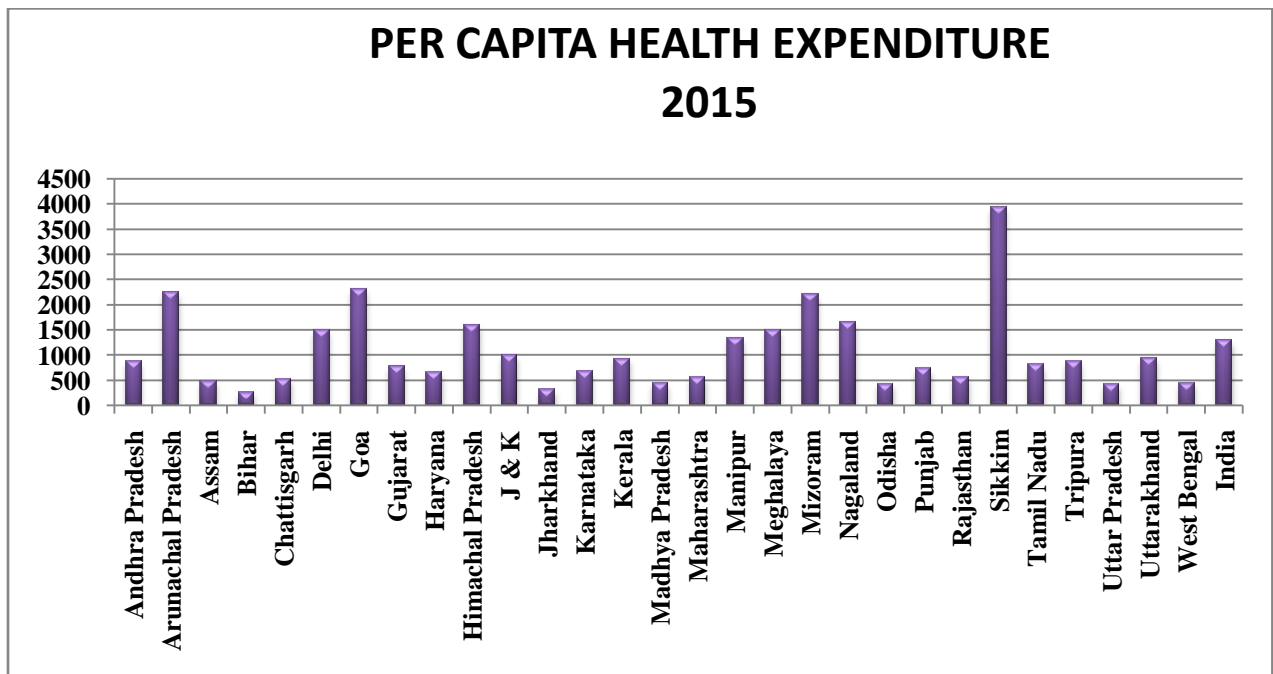


FIGURE 6

## **RELATIONSHIP BETWEEN PUBLIC HEALTH EXPENDITURE AND HEALTH STATUS IN INDIA**

Good health is universally acknowledged to be of intrinsic value and therefore constituted an integral element of development. One can be rich but sick enough to, not to enjoy any opportunities that wealth opens up and poor health may translate into worsening economic opportunities as well (National Health Commission Report, 2000). Health is a multidimensional subject. World Health Organization has highlighted the three dimensions of health-physical, mental and social. Health is a multifactor as well. There were numerous factors that influenced health like hereditary factors, environmental factors, life style, adequate housing, basic sanitation and socio-economic conditions including income, education, availability and quality of health infrastructure and per capita health infrastructure (Park, 1994).

Another major factor that influence health is per capita health expenditure. Available information showed that government spending on health has stagnated around 1 percent of GNP on health (National Health Commission Report, 2000). Along with the above mentioned factors viz. income and per capita health expenditure, level of literacy also influenced health. The world map of illiteracy closely coincided with the maps of poverty, malnutrition, infant mortality and life expectancy at birth rates. Studies indicated that education to some extent compensated the effects of poverty on health irrespective of availability of health facilities. Thus, health is affected by host of factors- Infant Mortality Rate (IMR), Life Expectancy at Birth (LEB), Crude Death Rate (CDR), Crude Birth Rate (CBR), Number of Doctors serving per '000 of population, Number of Hospitals serving per '000 of population, Number of Beds serving per '000 of population, Literacy Rate and Sex Ratio. In order to analyze the relationship, simple regression has been applied by taking various health indicators as a function of per capita health expenditure.

## RELATIONSHIPS BETWEEN HEALTH STATUS INDICATORS AND PER CAPITA PUBLIC HEALTH EXPENDITURE

The results of simple regression between health status indicators as dependant variable and per capita public health expenditure (PCHE at constant prices) as independent variable for the year 2001, 2011, 2015 are given in Table 17.

### Regression Equations

$$SR = \alpha + \beta \text{ PCHE} + e$$

$$LIT = \alpha + \beta \text{ PCHE} + e$$

$$CDR = \alpha + \beta \text{ PCHE} + e$$

$$CBR = \alpha + \beta \text{ PCHE} + e$$

$$IMR = \alpha + \beta \text{ PCHE} + e$$

$$HOSP = \alpha + \beta \text{ PCHE} + e$$

$$BEDS = \alpha + \beta \text{ PCHE} + e$$

$$DRS = \alpha + \beta \text{ PCHE} + e$$

In the given regression equation

PCHE = Per capita health expenditure

SR = Sex ratio

LIT = Literacy rate

CDR = Crude Death rate

CBR = Crude Birth rate

IMR = Infant Mortality rate

HOSP = Hospitals served per 000' population

BEDS = Beds served per 000' population

DRS = Doctors served per 000' population

**Table-17**  
**The Effect of Per Capita Public Health Expenditure on Health Status in States of India**  
**Results of Simple Regression (2001, 2011, 2015)**

Variables		Constant	Regression Coefficient	R <sup>2</sup>	F- ratio
Sex ratio	2001	0.2812 (4.9692)	0.149 (1.741)*	0.108	3.032
	2011	0.931 (0.125)	0.035 (0.307)	0.094	2.603
	2015	1.4552 (1.9659)	0.355 (0.025)*	0.126	3.596
Literacy rate	2001	0.2897 (2.4129)	-0.778 (-0.1524)	0.024	1.605
	2011	2.213 (3.579)	-1.065 (-0.208)	0.043	1.135
	2015	1.534 (3.8982)	0.340 (1.801)*	0.219	7.859
Infant Mortality Rate	2001	0.3559 (1.1451)	-0.290 (-1.515)*	0.084	7.256
	2011	0.8116 (3.884)	0.307 (1.615)*	0.094	2.653
	2015	0.3280 (1.354)	0.066 (0.394)	0.215	20293
Crude Death Rate	2001	0.6733 (0.495)	0.281 (1.464)	0.079	2.142
	2011	0.3715 (1.6116)	0.2316 (1.184)*	0.253	1.403
	2015	0.5687 (0.336)	1.021 (1.241)	0.184	6.293
Crude Birth Rate	2001	1.454 (14.806)	1.182 (0.926)	0.033	1.858
	2011	0.1206 (1.5234)	0.206 (1.051)	0.042	1.104
	2015	1.132 (1.7530)	0.215 (0.228)*	0.176	5.967
Hospitals	2001	0.214 (1.0617)	0.214 (1.550)*	0.088	2.403
	2011	0.160 (1.724)	0.307 (1.610)*	0.094	6.359
	2015	0.572 (1.5682)	0.248 (1.3241)*	0.065	4.962
Doctors	2001	3.559 (1.4075)	0.290 (1.515)	0.104	2.914
	2011	0.175 (1.4790)	0.341 (1.812)*	0.116	3.285
	2015	0.226 (1.074)	0.179 (1.039)*	0.070	5.032
Beds	2001	0.737 (1.3805)	0.326 (1.6152)*	0.110	3.090
	2011	0.251 (1.2804)	0.352 (1.5752)*	0.090	5.378
	2015	0.306 (1.6821)	0.287 (2.1499)*	0.183	3.618

\* stands for significant at 10 percent level

From Table-17 it is observed that the variables Sex Ratio in 2001 and 2015, Hospitals in 2001 and 2011, Beds in 2011 and 2015 were individually found to be positively significantly influencing Per Capita Health Expenditure (PCHE) in the states of India. Sex ratio is positively related to PCHE which means an increase in PCHE is bound to increase sex ratio (that is number of females per '000 of males). It is a good indicator as public becomes aware of importance of female child and there is improvement in girl population above male child.

The effect of Literacy turned out to be positive and significant in 2015, whereas, the effect of Crude Death Rate in 2011 and Crude Birth Rate 2015 was significant.

Infant Mortality Rate (IMR) has a significant and negative relation with PCHE in 2001. Infant Mortality Rate (IMR) is a significant with PCHE in 2011 and insignificant in 2015. It is negatively related to PCHE, which means that an increase in PCHE is bound to decrease IMR.

Hospitals served per 000' population, Beds served per 000' of population and doctors served per 000' of population in 2011 and 2015 showed positive and significant relation with PCHE indicating thereby that as PCHE increases these health infrastructural indicators showed increment. The variables Sex Ratio, Hospitals, Beds were individually found to be positively significantly influencing PCHE in the states of India. Thus, as PCHE increases, health infrastructural indicators showed improvement.

Thus, during 2001 Crude Death Rate Crude Birth Rate, Literacy, Beds were the indicators which showed non-significant relationship between health status indicators and per capita health expenditure. During 2011, Literacy was negative and non-significant variables. Trend changed during 2015, where the most of the variables showed significant relationship between health status indicators and per capita health expenditure. Values for  $R^2$  are relatively low because health is a multifactor and is also affected by factors other than per capita health expenditure like gender empowerment, poverty reduction, education, adequate housing, clean drinking water, sanitation etc., This finding is in confirmity with the findings of Malhotra and Shwetha (2006) and Bhatia (2011).

The health needs of the country are enormous and the financial resources and managerial capacity available to meet them, even on the most optimistic projections, fall somewhat short. It has to be recognized that such health needs are also dynamic, as threats in the area of public health keep changing over time. The policy, while being holistic, focuses on the need for enhanced funding and an organizational restructuring in order to facilitate more equitable access to the health facilities. With the population of 1.21 Crores in India, the government is spending only 1.3 percent in terms of GDP for health sector. When compared to the developed and many developing countries the share of public expenditure in the countries total expenditure on health sector appears to be very low for India and it is lower than other Asian countries.

In the past, there has been an improvement in health facilities and as consequence there has been decline in birth rate, death rate and infant mortality rates. But the improvements are not heartening. Still, India is a land of largest number of literates and medically uncured people. The governmental measures are quite disheartening both in terms of infrastructure as well as health expenditure. People are compelled to look towards private hospitals.

Increasing public expenditure on health is a necessary policy intervention for accelerating the economy's health status. Growth oriented policies may result in bringing about improvements in the health status of the population.

There is an urgent need to increase the expenditure on public health services by the government. However, it is also necessary that the spending on health is properly utilized to benefit the entire population, especially the under privileged. The government expenditure must be properly managed so that there is an overall improvement in the health indices.

## **CHAPTER V**

### **SUMMARY AND CONCLUSION**

Health plays a vital role in making an individual and society productive, efficient and optimal. There is a positive correlation between health and development, both social and economic development. Human development fits into both of these arenas attracting and magnifying the importance of health. Investment in the health of people is considered to be a development strategy. A comparison of health indicators with economic indicators at a country level shows that the countries whose inhabitants enjoy the highest life expectancy tend to be those with the highest income per person. Based on health indicators policies can be framed and executed. There are several indicators like sex ratio, literacy rate, crude birth rate, crude death rate, infant mortality rate, maternal mortality rate. Developing country or a developed one, developing a good health infrastructure and assuring good health to everybody becomes very critical and important. Health infrastructure is an important indicator for understanding the health care policy and welfare mechanism in a country. It signifies the investment priority with regards to the creation of health care facilities. Infrastructure has been described as the basic support for the delivery of public health activities. Keeping these facts, a need was felt to study inter-state disparities in health status and public health expenditure in India and across its states with the following objectives,

### **OBJECTIVES**

The specific objectives of the study are

- To examine the nature and level of inter-state disparities in selected health indicators
- To analyse the trends in the growth of public health expenditure.
- To estimate the relationship between health status and public health expenditure over time and between the states
- To explore the relationship between health care expenditure and economic growth
- To suggest measures to improve health status in India.

## **HYPOTHESES OF THE STUDY**

The current study is attempted to test the following hypotheses

- There exist inter-state disparities in India in the health status, but these have declined overtime.
- The states with higher per capita health expenditure have experienced relatively better health status.

## **METHODOLOGY**

The secondary data was used for the study. The major source of information is Sample registration system, Ministry of Health and Family Welfare Reports, World Health Reports, Central Bureau of Health Intelligence (CBHI), Census of India, Directorate General of State Health Services, National Health Profile, All India Central Statistics Office. Three different years 2001, 2010, 2015 were considered for the study. Statistical tools like as percentage, graph, regression, etc., were used to analyse the data.

## **FINDINGS**

The major findings of the study is given below

- The sex ratio in different states of India over the study period reveals that at different time intervals- 2001, 2010 and 2015 there is a unique increase in the sex ratio in all the states.
- The literacy rate also increased in all the states.
- The study found out that there is a decline in Crude Birth Rate, Crude Death Rate and Infant Mortality Rate during the study period.
- In terms of number of hospitals Rajasthan had the maximum number of hospitals with 3145 followed by Jammu and Kashmir with 2812 and further Odisha had third place with 1750 hospitals.
- With regard to the growth in the number of hospital beds during 2014-15, the state of Maharashtra had the maximum number of hospital beds with 163865 followed by West Bengal with 78566 and Tamil Nadu with 64243 beds.

- Moreover the doctor patient ratio in rural areas of India is 1:20,000, while the urban ratio is 1:2,000 against the statutory 1:250 ratio from WHO for which India requires 6,00,000 doctors.
- There was a speedy growth in terms of number of doctors, and this is particularly spectacular in Uttar Pradesh which had only 812 doctors in 2001, this rose to 10164 in 2011 and further to 10798 in 2014-15. For Delhi it was 3629 in 2001 but by 2014-15 there was phenomenal increase to 9121. So also is the case with Sikkim and Mizoram, which was around 200 in 2001 rose to more than 300 by 2014-15.
- The level of income determines good health status and also contributes to increase in the level of income. States like Uttarakhand, Jharkhand, and Andhra Pradesh witnessed a steady increase in NSDP and they had better economic growth.
- The major factor influencing health is per capita health expenditure. Higher levels of health expenditure are generally associated with higher levels of health status. The overall the health expenditure in India was Rs 103249 crore in 2001, which increased to Rs 130726 Crore in 2011 and further to Rs 159492 Crores in 2015. The states like Uttarakhand it is of the order of Rs 1523 Crores in 2001, this rose to Rs 7373 Crores in 2011 and Rs 9660 Crores in 2015 followed by Uttar Pradesh Rs 1881 Crores in 2001, Rs 1738 Crores in 2011 and Rs 8798 Crores in 2015 and further the third place was occupied by Andhra Pradesh with Rs 7384 Crores in 2015. The states like Maharashtra, Tamil Nadu, Karnataka, and Kerala witnessed increase in health expenditure.
- The study examined the relationship between health expenditure and Net state domestic product of different states for three different years 2001, 2011, 2015. The regression result indicated that there is significant relationship between health expenditure and Net state domestic product where the  $R^2$  value for 2001 is about 0.968, 2011 it is around 0.952 and 2015 it is around 0.972.
- The states having higher per capita were Delhi with Rs 39,026 in 2001, Rs 145129 in 2011 and Rs 240849 in 2015, Haryana Rs 25,598 in 2001, Rs 93852 in 2011, Rs 147076 in 2015, Karnataka 17,402 in 2001, 62251 in 2011, 101594 in 2015 and Tamil Nadu 19,748 in 2001, 78473 in 2011, 128366 in 2015 and other

better performing states are Uttarakhand, Andhra Pradesh, Punjab. Low performing states are Uttar Pradesh, Assam and Bihar.

- There was a decline in per capita health expenditure from Rs 997 in 2001 to Rs 802 in 2011 however in 2015 there was an increase Rs 1280 in 2015 where the states like Uttarakhand it is Rs 1110 in 2011 with rose to Rs 9520 in 2015. In Kerala with Rs 1,858 in 2001 it was decline Rs 880 in 2011 and Rs 929 in 2015 and third place is Andhra Pradesh it was Rs 1039 in 2001, Rs 7200 in 2011 and Rs 8600 in 2015. The other states like Tripura, Tamil Nadu, Punjab, Gujarat and Haryana which was around 60 to 70 per cent and also the states like Bihar, Jharkhand, Uttar Pradesh are considered to be lower 20 to 30 per cent of per capita health expenditure.
- In order to analyze the relationship between major indicators of health with per capita health expenditure, simple regression has been applied by taking various health indicators as a function of per capita health expenditure.
- Sex ratio is positively related to PCHE which means an increase in PCHE is bound to increase sex ratio.
- The effect of Literacy turned out to be positive but non-significant, whereas, the effect of Crude Death Rate and Crude Birth Rate was in- significant.
- Infant Mortality Rate (IMR) has a significant and negative relation with PCHE. Hospitals served per 000' population, Beds served per 000' of population and doctors served per 000' of population in 2011 and 2015 showed positive and significant relation with PCHE indicating thereby that as PCHE increases these health infrastructural indicators showed increment.

## **SUGGESTIONS**

On the basis of the examination of theoretical issues and experience regarding health sector development in India following general suggestions are made.

India has made noticeable improvements in health sector since the 1980's. But even then the conditions with respect to public health sector are appalling as compared to the countries like Sri Lanka, China and some countries of South East Asia. The health status of majority of the population continues to remain poor even after a decade of reforms.

Education plays an important role in determining the health status of population. One might also expect the health-related child care to improve with the level of the mother's education. Studies found out that infant mortality falls both in rural and urban areas as the literacy and formal education level of the mother increases. Thus, emphasis should be made on increasing the literacy rate among the masses.

Health indicators are significantly related to per capita public health expenditure. Hence, in order to improve the health status it is very important that government should raise its expenditure on health sector.

Provision of adequate health facilities is must for realizing the goal of economic development. Special policy packages must be provided to states which are lagging in health infrastructure. Therefore, governments must give serious thought to the administrative, regulatory, financial and institutional.

Public health sector spending by the central and state governments are low. Further health sector spending as percentage to GDP is also low so there is need to prioritize this sector. More allocation of funds would provide a great channel for the public to access the health facilities.

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