

Impact of Public Spending in Health on GDP: A Study done in the 15 States of India from 1987-2014

By

Eti Khatri

*Dissertation submitted for the partial fulfillment of the
MBA Hospital and Health Management*

Academic year, 2015-2017



The IIHMR University, Jaipur

1, Prabhu Dayal Marg, Sanganer, Airport
Jaipur 302029, Rajasthan
Ph: 0141 3924700, Fax: 3924738
Website: www.iihmr.edu.in

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Website: www.iihmr.edu.in

TO WHOMSOEVER MAY CONCERN

This is to certify that Eti Khatri student of MBA Hospital and Health Management from The IIHMR University, Jaipur has undergone internship training at National Health Mission, Gujarat from 6th February to 8th May, 2017.

The Candidate has successfully carried out the study designated to her during internship training and her approach to the study has been sincere, scientific and analytical.

The Internship is in fulfillment of the course requirements.

I wish her all success in all her future endeavors.



Col. (Dr.) Ashok Kaushik

Dean, Academics and Student Affairs

The IIHMR University, Jaipur



Dr. Monika Chaudhary

Associate Professor

The IIHMR University, Jaipur



Dr. Ravi Dedania
Medical Officer of Health

JUNAGADH MUNICIPAL CORPORATION

" Swami Vivekanand Bhavan " Azad Chowk, Junagadh-362001

Phone No. 0285-2622089 Fax No. 0285-2651510

E-Mail –moh.health.junagadh@gmail.com

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Dt. 01/05/17

The certificate is awarded to

Ms. Eti Khatri

In recognition of having successfully completed her

Internship in the department of

Urban Health Society– JuMC, Gujarat

She has successfully completed her project on

Impact of public spending in health on GDP: a study done in the 15 states of India

Date – 08/05/2017

Organization – National Health Mission, Gujarat

She comes across as a committed, sincere and diligent person who has a strong drive and zeal for learning.

We wish her all the best for future endeavours.



Medical Officer of Health
Municipal Corporation Junagadh

THE IIHMR UNIVERSITY, JAIPUR

CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled Study on "Impact of public spending in health on GDP: A study done in 15 states of India from 1987-2014 and submitted by Eti Khatri Enrollment No. IIHMR-U/01/2015-17/0276 under the supervision of Dr. Monika Chaudhary for award of MBA in Hospital and Health of the University carried out during the period from 6th February to 8th May embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other institute or other similar institution of higher learning.



Signature

THE IIHMR UNIVERSITY, JAIPUR

CERTIFICATE BY SCHOLAR

This is to certify that all ethical issues have been considered while collecting data for my dissertation titled Impact of public spending in health on GDP: A study done in 15 states of India

A handwritten signature in blue ink, appearing to be 'Sri', with a horizontal line drawn through it.

Signature of student

Acknowledgement

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Abbreviation

GDP – Gross Domestic Product

NDP – Net Domestic Product

UN classification – United Nations Classifications

IPFS - Indian Public Finance Statistics

SAS - Statistical Analysis Software

Introduction

In India, the level of public health and education spending is a current issue recently. Many research studies and policy documents have now repeatedly highlighted a per cent GDP which is 'Indicator of the priority accorded to health and education in the planning of the country'.

For example "chronically sick person 'in spite of high income he/she cannot enjoy life and would contribute very little to the society. The health of a person and individual is inextricably bound up with the development. Therefore, the expenditure on health is not only the welfare of the society but also an end to the economic development. 'Development is not only the process of increasing per capita income but it is also process of improving the quality of all aspects of human life'. When we compare health indicators with the economic indicators at a country level shows that the countries whose inhabitants enjoy the highest life expectancy in the country tend to be those with the highest income per person."

Many studies also shows that 'Net domestic product' - NDP of India are being calculated at constant prices are gradually growing over the years. Any increase in this should also show the way to rise in the healthcare expenditure. "India's public health expenditure as a percentage of GDP is above 1 per cent of the GDP for public health care while the allocation to this health sector stands at 2 per cent for the least developed countries (UN classification)".

The majority of the economies like Australia, US, and UK countries economy and so on, have made a input of above 6 per cent while India like country being a mixed economy in healthcare expenditure and having the assist of public policies intervention contributes just 1.08 per cent, which is approximately five to six times lesser share than the total world average. It is very distant from the share of the lower middle income countries' economies we belong in. Near to the ground level of public investment in country has particularly resulted in the poor infrastructure in health sector for several type of preventive healthcare as a percentage of the public health expenditure which is out of the total health expenditure which is incurred 26.18 per cent.

The Indian Constitution tells that "the health sector falls under the concurrent list(It is a list of 52 items given in the Seventh Schedule to the constitution of India) and thus, the provision of the public healthcare in India it is a responsibility of both the Central and State governments. Healthcare expenditures of the 15 major states of India which is choose for the study at constant price in 1996-97 shows a clear rise in the health expenditure". Although the expenditures in the health have greater than before year by year, but they have unsuccessful to up rise in the proportion to the needs of the increasing proportion of the population. "Expenditure in health in

different states like—for example Haryana has started and ended as the state which is allocating the least expenditure in the favor of health care facilities. It has been lagging behind, to be beaten only by state Orissa. In the healthcare expenditure an important point is that there is a very wide variation across states of India, and further, these gaps have actually widened over time year by year. And Haryana's neighboring state which is Punjab, with the high per capita income which is next only to Delhi runs close. The states like - Kerala and Gujarat which move along similar in public healthcare expenditure and in spite of, a huge margin are there between Kerala and Gujarat in the successful implementation of healthcare facilities.”

This research examines the relationship between healthcare expenditures and economic growth of the country, which directly gives the idea about the “impact of public spending on GDP of India in different states”.

Always health is considered as the priority sectors when we compare all sectors of the country in almost all five year plans in India. Although total public expenditure in these sectors has increased significantly year by year over time, per capita expenditure in the real relations has stagnated for several states, which may have been answerable for such progress in these all sectors. In 2010, the public expenditure share on health is 1.2 per cent of the GDP (The World Bank, 2013) which are significantly very lower when we compare to developed countries.

Apart from the good dispute which pressures the necessity for public delivery, the presence of 2 more bases of market bombs: the scarce consumer information and partial marketplace for healthcare amenities require for the require for government participation in the stipulation of health care goods and services in an effective manner. Equity arises from market bombs and so involves government involvement to provide better convenience and make use of health facilities across the population on a broader basis and also the load of payment to be there dispersed increasingly among diverse income groups.

If the collected revenues are to be proficiently and equitably dispersed it is the responsibility of the government which has to perform such innovative chores in order to achieve access to health care in country to all. A similarly significant aspect that goes with the need for government funding in healthcare is that which categories of health care the government should finance.

“Public Economics also places out the categories of healthcare that necessity to be reinforced by the government. It is claimed that the non-patient related precautionary health care should be providing by the government free of cost on excuse of the externality element and non-excludability appearances of these services” was stated by Gertler 1990.

Each and every one state has been playing an important position in the delivery of health for an extensive time. By means of the beginning of economic restructurings, the explanation of the position of State has undergone a change. “For example the neo-classical economists contend that the State should play a slight or minimal role limited to the endowment of pure public goods that have tumble over benefits - the delivery of services should be unbundled to the services with the State being a mere supervisor and financier”.

Under the changing scenario the position of the variety of states is defined again specially, the central issues spin around as government should hinder in the healthcare for an effective release of the healthcare services. Institutional financial side provides - structure for such involvements which are able to be complete on the base of measurability and contestability of the healthcare services.

This quote is affirmed 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 labor, knowledge generation about rare health conditions.”

Literature review

In the journalism of health finances, the route of causality between the financial growth of the individual country and healthcare expenditure of that country is still under the controversy. It is still unclear to many countries that “whether economic growth leads to the higher health expenditure” or it is the “health expenditure causes economic growth” is a million bucks question for all the countries. In view of the fact that from the influential work of Newhouse, a huge quantity of studies have been accepted out throughout many years to estimate the causal association between public expenditure in healthcare and economic growth of the country. All these studies found a complex causal inter-relationship that happens between healthcare expenditure and economically development of the country. Though, very limited studies are shown on the path of causal association between public healthcare expenditure and economic growth.

The Economic survey, 2011-12 of the government of India (GoI) recommends that “public spending in healthcare was about 1.35 per cent of GDP in 2010-11”.

The “Approach Paper of the government” of India, 12th Five Year Plan designated that public healthcare spending as a per cent of GDP was about 1.4 per cent in 2011-12 (when rural water supply and sanitation was excluded in them).

The Indian Public Finance Statistics (IPFS) 2010-11 (which is published by the Ministry of Finance) recommends that public healthcare spending as a per cent of GDP was nearby 1.4 per cent (when water supply and sanitation was included).

In the ‘Keynesian model’ - increase in the public expenditure (on infrastructures) pointers to higher economic growth. Conflicting to this view, there is a neo-classical growth models which claim that government fiscal policy does not have any effect on the economic growth of the national output in the country.

In the „Folster S, Henrekson M, 2001 – “Growth Effects of Government Expenditure and Taxation in Rich Countries and European Economic Review” deliberate the relationship between public expenditure in health and economic growth for a sample of well-heeled countries for a 1970-95 periods, using numerous econometric approaches. In the Saudi Arabia, it was examined that the relationship between public expenditure in health and economic growth was positive there. The author reported that it indicates that the size of government is also a very important in the performance of economy in a particular country.

‘Adolph Wagner’, who is the ‘German political economist (1835-1913), supposed that a efficient “Cause and Effect” association occurs between the expansion of an economy of country and the development of the public segment in health. He obtainable his famous “Law of ever increasing state activity” that designates that the community progress was the reason of the comparative enlargement of the all state activities.

On the other hand, famous ‘Keynesian macro-economic’ theories accept that the public spending in healthcare grounds national income.

Public Economics delivers “the theoretical base for the government involvement in the delivery of health care services. Governments have expected that the considerable position in the delivery of certain goods and services of which healthcare is of noteworthy importance. It is claimed that definite health services hold the characteristics of a good merits which generate very large externalities. They are non-rival and non-excludable in nature.

Indecision about occurrence of ill health and also health as a basic human right needs government intervention in delivery of health care services free of cost or at subsidized prices (Gertler1990).”

From Atlas 2014, „WHO Global Health Expenditure Atlas September 2014“ some data are -

- Total expenditure for health (globally) in 2011: US\$ 6.9 trillion.
- According to World Bank, the total expenditure on healthcare in India as a proportion of GDP in 2014 was 4.7%.
- Country with highest government spending per person: Norway (US\$ 8436)
- Average Total expenditure for health per person per year: US\$ 1008

PROBLEM FORMULATION

In order to do an experimental analysis of the impact of public spending in healthcare expenditure on GDP, fifteen states are choosing. If there is a fluctuation in GDP seem to affect the healthcare expenditure or vice versa then that indicates that they are inter-linked and mutually affecting each other. This also designates that both there is an absence or presence of common factors affecting both GDP and health expenditure, therefore the problem for this topic was formulated as follows:

Do changes in health expenditure impact GDP changes in the 15 states of India and vice versa?

Objective

To understand the health expenditure's impact on the GDP in 15 states of India from 1987-2014 and vice versa.

Methodology

In context of India, great statistics of the studies are passed out on healthcare finance at national level. Though, study is not conduct relating to the causal connection between public healthcare expenditure with economic growth of the country with special position to the states of India. Hence, an effort is made here to explore empirically the association between public health care expenditure and the economic growth of country in the 15 state of India.

Here what is the public healthcare expenditure – It is only the overheads what the all states of India pay out on the public and medical health.

The outflow on different ‘family welfare (FW) programs’ and ‘water & sanitation programs’ are debarred from the public healthcare expenditure because these programs are sponsor by the government of India.

This report inspects the relaxed association between public healthcare expenditure with economic growth in the 15 state and based on the yearly data sequence as of the dated 1987 to 2014. The essential evidence composed from an assortment of sources was analyzed.

In writing of economics, the impression of “mixing series” was presented by ‘Granger’ (1980, 81). The reasonableness following cointegration systems if, in the extensive sprint 2 or additional series move together, yet the series itself are trended, the modification between them is constant.

Mathematically –

Y_t and X_t (both I (i)), if there is a constant α (alpha) is present-

$$X_t - \alpha Y_t \text{ is } I(0)$$

If this equation is correct, then the two series are cointegrated with the constant α as a measure of co integrating parameter.

$$X_t = \alpha Y_t$$

This equation is the extended run equilibrium relation and sometimes termed as ‘attractor’ (Granger, 1988) any divergence from this equation, the quantity to which the series are out of equilibrium.

To be short of of cointegration proposes that such variables have no extended relationship. The prerequisite for the cointegration method is the series X_t and Y_t should be stationary in the similar order.

Study Design – A descriptive study which is done by collecting secondary data from Planning Commission and MOHFW documents that is used to analyze the health expenditure impact on the GDP and vice versa in 15 states of India from 1987-2014.

Study Duration – The study is conducted for a period of three month of the dissertation period allotted to us, 6th February 2017 to 8th May 2017 that is till the completion of the research.

Method of Data collection- Health expenditure data is collected from MOHFW and Planning Commission documents for 15 states of India. The 15 states chosen are - Andhra Pradesh, Assam, Bihar, Gujarat, Haryana, Kerala, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Uttar Pradesh, Tamil Nadu and West Bengal.

Statistical Method Procedure – The data is collected and is filtered as per the requirement for research question and objective. The sorted data is analyzed on Statistical Analyze Software (SAS) using unit root test and Granger's causality test.

In the direction to examine the causal association between two time series, unit root testing was done by the Phillips Perron (PP) test. Unit root test provide information about the stationarity of data that whether a series is stationary or not. The outcomes of unit root test are given in table below in the analysis part of this report.

Once it was established that the series was stationary, second derivative Granger causality test was employed to test whether one variable caused a change in another variable.

Trying causality in the Granger sense, it involves F-test to test that whether this lagged information on a variable Y delivers any statistically noteworthy information about a variable X in the attendance of lagged X. If not, then Y does not cause any impact on X.

(Where X = GDP, Y = Health expenditure)

Granger's Equation

There are many ways in which to implement a test of Granger causality. One particularly simple approach uses the autoregressive specification of a bivariate vector autoregression. Assuming a particular autoregressive lag length p , and estimating the following unrestricted equation by ordinary least squares (OLS):

$$x_t = c_1 + \sum_{i=1}^p \alpha_i x_{t-i} + \sum_{i=1}^p \beta_i y_{t-i} + u_t$$

$$H_0: \beta_1 = \beta_2 = \dots = \beta_p = 0$$

After that, conducting a F -test of the null hypothesis by estimating the following restricted equation also by OLS:

$$x_t = c_1 + \sum_{i=1}^p \gamma_i x_{t-i} + e_t$$

Comparing their respective sum of squared residuals,

$$RSS_1 = \sum_{t=1}^T \hat{u}_t^2 \quad RSS_0 = \sum_{t=1}^T \hat{e}_t^2$$

If the test statistic

$$S_1 = \frac{(RSS_0 - RSS_1)/p}{RSS_1/(T - 2p - 1)} \sim F_{p, T-2p-1}$$

Ac
Go

It is worth noting that with lagged independent variables, as in Granger-causality regressions, the test is valid only asymptotically. An asymptotically equivalent test is given by

$$S_1 = \frac{T(RSS_0 - RSS_1)}{RSS_1} \sim \chi^2(p)$$

Results

As a part of empirical analysis, the unit root result of the variables is reported. In their level form when the time series were tested they were found to be non-stationary. Then these non-stationary time series were transformed into stationary time series by taking a second derivative of log transform. After that the time series were tested for unit root. As a result of testing it was found that for all-time series the variable Y is a stationary time series with a non-zero mean and the time series is difference stationary.

The selection of an optimum lag length is very important in estimation. Akaike Information Criterion and Schwarz Information Criterion were used to determine an appropriate lag length. It was found that as lag length increased (lag length up till 10 was checked) it gave a better estimate. Considering the sample size, the maximum possible lag length that could be taken was four. Therefore lag length was decided as four.

A Pairwise Granger Causality Test was first done individually in GDP and health expenditure to understand the causal. The direction of causality has been examined through F values as presented in table.

The result of all the time series is given in the table below –

TABLE 1 – UNIT ROOT TEST (HEALTH EXPENDITURE)

STATES	PP	SIGNIFICANCE
1. ANDHRA PRADESH	-15.52	0.002
2. ASSAM	-20.73	0.002
3. BIHAR	-11.80	0.002
4. GUJARAT	-11.69	0.002
5. HARYANA	-6.50	0.002
6. KARNATAKA	-11.01	0.002
7. KERALA	-8.29	0.002
8. MADHYA PRADESH	-7.50	0.002
9. MAHARASTHRA	-10.07	0.002
10. ORISSA	-19.76	0.002
11. PUNJAB	-20.75	0.002
12. RAJASTHAN	-9.96	0.002
13. TAMIL NADU	-11.42	0.002
14. UTTAR PRADESH	-2.47	0.002
15. WEST BENGAL	-7.66	0.002

*significance level for random walk with drift model is -2.8947

TABLE 2: UNIT ROOT TEST (GDP)

STATES	PP	SIGNIFICANCE
1. ANDHRA PRADESH	-4.60	0.002
2. ASSAM	-25.62	0.002
3. BIHAR	-25.62	0.002
4. GUJARAT	-12.94	0.002
5. HARYANA	-16.68	0.002
6. KARNATAKA	-11.93	0.002
7. KERALA	-6.97	0.002
8. MADHYA PRADESH	-6.46	0.002
9. MAHARASTHRA	-3.43	0.007
10. ORISSA	-16.52	0.002
11. PUNJAB	-3.58	0.0052
12. RAJASTHAN	-11.16	0.002
13. TAMIL NADU	-14.72	0.002
14. UTTAR PRADESH	-7.25	0.002
15. WEST BENGAL	-13.04	0.002

*significance level for random walk with drift model is -2.8947

After testing the unit root test if time series are stationary, a Pairwise Granger Causality Test is done to understand the presence or direction of causality between health expenditure and GDP markets. The value of F was compared against a critical value of F at 99% confidence levels. If the value of F is more than the critical value of F the hypothesis will be rejected. In some cases if the value of F is less than the critical value but the value of Asymptotic Equivalent Test is highly significant.

TABLE 3: Pairwise Granger Causality test (Health Expenditure)

Null hypothesis	F statistics	Probability	Asymptotic equivalent test statistic	Probability	Criterion
In Andhra Pradesh health expenditure does not affect GDP.	6.008	0.0033	36.76	2.017	<Reject
In Assam health expenditure does not affect GDP.	0.2432	0.909	1.488	0.828	>do not reject
In Bihar health expenditure does not affect GDP.	8.3381	0.0006	51.009	2.22E-10	<Reject
In Gujarat health expenditure does not affect GDP.	0.9106	0.4799	5.5711	0.2335	>do not reject
In Haryana health expenditure does not affect GDP.	2.250	0.1064	13.766	0.008	<Reject
In Karnataka health expenditure does not affect GDP.	2.362	0.0094	14.449	0.0059	<Reject

In Kerala health expenditure does not affect GDP.	15.498	0.00001	94.881	0	<Reject
In MP health expenditure does not affect GDP.	0.6786	0.6161	4.1517	0.30	>do no reject
In Maharashtra health expenditure does not affect GDP.	2.2146	0.1106	13.486	0.0083	<Reject
In Orissa health expenditure does not affect GDP.	2.770	0.0061	16.946	0.0019	<Reject
In Punjab health expenditure does not affect GDP.	0.770	0.5589	4.7154	0.3177	>do not reject
In Rajasthan health expenditure does not affect GDP.	2.299	0.100	14.070	0.0070	<Reject
In Tamilnadu health expenditure does not affect GDP.	8.455	0.0006	51.725	1.58E-10	<Reject
In Uttarpradesh health expenditure does not affect	9.3364	0.0003	57.117	1.17E-10	<Reject

GDP.					
In Westbengal health expenditure does not affect GDP.	1.0788	0.3977	6.6001	0.1585	>do not reject

By this table it is clear that health expenditure affects GDP significantly in 10 out of 15 states. Five states – Assam, Gujarat, MP, Punjab and West Bengal shows that there is no significant impact of public healthcare expenditure on GDP.

TABLE 4: Pairwise Granger Causality test (Health Expenditure)

Null hypothesis	F statistics	Probability	Asymptotic equivalent test statistic	Probability	Criterion
In Andhra Pradesh GDP does not affect health expenditure.	2.535	0.0782	15.511	2.017	>do not reject
In Assam GDP does not affect health expenditure.	24.430	7.3759E-7	149.454	0	<Reject
In Bihar GDP does not affect health expenditure.	27.230	3.3864E-7	149.454	0	<Reject
In Gujarat GDP does not affect health expenditure.	2.6573	0.0687	16.256	0.0026	<Reject
In Haryana GDP does not affect health expenditure.	21.749	1.6718E-6	133.053	0	<Reject
In Karnataka GDP does not affect health expenditure.	3.8815	0.0203	23.745	0.00008	<Reject
In Kerala GDP does not affect health expenditure.	10.1315	0.0002	61.980	1.112E-12	<Reject
In MP GDP does not affect health expenditure.	6.2788	0.0027	38.411	9.2144E-8	<Reject
In Maharashtra GDP does not affect health expenditure.	0.12841	0.9700	0.7855	0.9403	>do not reject

In Orissa GDP does not affect health expenditure.	9.4515	0.0003	57.821	8.319E-12	<Reject
In Punjab GDP does not affect health expenditure.	1.3673	0.2866	8.3650	0.0790	>do not reject
In Rajasthan GDP does not affect health expenditure.	5.4197	0.0053	33.156	1.11097-6	<Reject
In Tamilnadu GDP does not affect health expenditure.	17.879	6.3799E-6	109.383	0	<Reject
In Uttarpradesh GDP does not affect health expenditure.	4.2096	0.0150	25.753	0.00003	<Reject
In Westbengal GDP does not affect health expenditure.	10.489	0.0001	64.1711	3.846E-13	<Reject

It indicates 12 states have GDP impact on health expenditure. Three states – Andhra Pradesh, Maharashtra and Punjab shows that there are no impact of GDP on health expenditures.

Table 5: Health expenditure to GDP ratio of last three years

STATE	HEALTH EXPENDITURE TO GDP RATIO (in %)		
	2011-12	2012-13	2013-14
1. Andhra Pradesh	9.44	9.07	8.16
2. Assam	15.22	13.97	14.02
3. Bihar	12.55	11.66	10.88
4. Gujarat	5.80	6.51	6.07
5. Haryana	5.32	5.06	4.88
6. Karnataka	7.42	6.31	5.93
7. Kerala	9.06	8.04	8.21
8. Madhya Pradesh	9.42	10.01	9.72
9. Maharashtra	4.88	4.62	4.25
10. Orissa	7.38	7.21	7.58
11. Punjab	7.89	8.69	8.31
12. Rajasthan	9.22	7.92	7.69
13. Tamil Nadu	6.93	6.39	5.75
14. Uttar Pradesh	10.89	11.93	13.52
15. West Bengal	7.47	7.88	7.37

Limitation of the study

1. Only 15 states were taken to analyze the impact of health expenditure on GDP.
2. Underutilization of the public healthcare budgeted amount is not the focus area of the study.

CONCLUSION

These results exposed that there is bidirectional causality association from health expenditure to economic growth. This study indicates an existence of an inter-link between health expenditure and GDP in India. However, while fluctuations in the health expenditure seem to impact GDP, the same is also true for vice versa. This suggests that the factors affecting health expenditure seem to affect GDP too.

Policy Implication

Economically growth of the all countries would make a payment from both the demand lateral and provide lateral factors in the healthcare sector. With advanced income group, they will also demand for the finest health services. So, mostly they desire private healthcare services payable to its better services compare to public healthcare hospitals. The increment in the demand side for the better healthcare services, it gives hints to the private healthcare providers to supply such a good services. This change will decrease the economically growth of the country, giving on public healthcare expenditure.

Another important crucial factor is the escape of the resources of services. The significant fraction of funds assigned to the public healthcare sector comprises in dishonesty which leads to corruption and mismanagement in the healthcare services. Increasing in the disorganization and mishandling may not attract more expenditure in public health care.

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