Public Healthcare Expenditure And Its Effectiveness In Improving Maternal Healthcare In Southern Assam

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Abstract — In developing countries, the capacity of healthcare expenditure, as in case of curative spending as well as preventive spending, is quite limited due to the limited income of the majority of the population. Decisions regarding public healthcare provisioning and expenditure requires a sound judgment as to what to provide, how much to provide and the self-sustainability of the provisions in the long run. This paper takes up the case of Southern Assam region of India (Barak Valley) to probe into the public healthcare spending and its provisioning as well as its impact on maternal health of the region. Basic awareness among women regarding health, healthcare and family planning is needed to control the population growth in the developing and less developed countries which is a significant contributor to poverty and social problems. Maternal health is invariably related to child health and welfare and contributes to the human capital formation of the country in the long run. The paper shall try to probe into the relationship between per capita expenditure on health sponsored by the state and its impact on selective maternal healthcare indicators. The study shall take up the case of Barak Valley (Southern Assam) located in the north-eastern most part of India and examine the maternal healthcare status and its provisioning in this region through the study of selective maternal healthcare indicators, during NRHM regime.

Index Terms — Health, Healthcare Indicators, Institutional Delivery, Maternal Health; NRHM, Public healthcare expenditure, India

1 INTRODUCTION

Maternal and child health forms the very backbone of the human capital formation of any country and thus is a significant and intrinsic factor behind its developmental status. A healthy mother brings forth a healthy child. So mother’s health and education is very important for the social and economic upliftment of a nation.

Healthcare and therefore the subsequent human capital formation require an investment in form of healthcare expenditure. Expenditure on health can be broadly classified into two divisions: the first type being curative and rehabilitative and the second type being preventive and for the maintenance of good health. The first type of expenditure comes as a health shock to the individual and is an unplanned expenditure. Whereas the second type of expenditure is mostly a sustained expenditure to be maintained throughout a period of time and can be pre-planned as well. In developing countries like India, the capacity of healthcare expenditure, as in case of curative spending as well as healthcare investment as in case of the preventive and maintaining health spending, is quite limited due to the limited income of the majority of the population. But considering the importance of health capital and maintenance of a healthy population, the responsibility of health expenditure is to be partially taken up by the government in form of public provisioning of healthcare facilities.

Expenditure on health is one of the crucial elements in improving the health. Wolfe (1986) in his study used the data of six OECD countries and found that health expenditure is positively related to health status. He further argued that improvement in health status not only depends on existing health expenditures also depends on the pattern of life style followed by the individuals. In this regard, Hitiris and Posnett (1992) also showed that there exist relationships between lower mortality rates and increased per capita health expenditure.

The study by Bhatt and Jain (2006) examined the relationship between income and public-private health care expenditures. It was found that, India has created huge system of public health service delivery. But sadly, more than 60 percent of the health budget is spent in the recurring costs of staff salary. Government resource constraint and the ever increasing healthcare demands of the population, which requires regularly upgrading the health infrastructure, pave the way for initiation and growth of private health system. Government resource constraint and the ever increasing healthcare demands of the population paves the way for private health care facilities which are profit-oriented. Thus, the basic objective of health care systems is to meet country’s health need in an equitable and efficient manner.

Coming to the Indian context, India's progress on reducing child and maternal mortality has been quite slow. According to Sample Registration Survey, 2008, the number of maternal deaths during pregnancy, delivery or in the six weeks after delivery, had been 677 per 100,000 live births in 1980, which had come down to 254 deaths per 100,000 live births by 2008.

Within India itself, there are wide variations in maternal and neonatal mortality across regions. Maternal mortality is quite low in states like Kerala and Punjab. Contrastingly, in as many as 10 out of 15 major states (Assam, Bihar, Gujarat, Orissa,
Madhya Pradesh, Haryana, Karnataka, Uttar Pradesh, Bengal and Rajasthan) MMR exceeded 400 per 100,000 live births and in three states out of them( one being Assam), MMR was as high as 700 per 100,000 live births (Bhatt, 2002). Evidences from National Family Health Surveys (NFHS) also suggest a wide variation in rural-urban MMR. As expected, maternal mortality rate has been much higher in rural areas compared to urban areas.

Pregnancy and childbirth are not only potentially risky for women, but also, pregnancy comes at a really early age which aggravates the risk associated. About one-third of Indian women are married by the age of fifteen and two-third by eighteen. The median age at first child birth is 19.6 years (NFHS-2). This age for motherhood is not safe as physical maturity is not fully attained at that time. NFHS-2 results show that mothers who are younger than twenty years old at the time of childbirth were associated with 1.7 times higher neonatal mortality rate and 1.6 times greater infant mortality rate than mothers giving birth between the age of 20-29 years.

2 OBJECTIVE OF THE STUDY

This paper shall try to explore the relationship between per capita public health expenditure and its effect on selective maternal health or healthcare parameters. This shall try to validate the reason behind the huge governmental expenditure on the health sector, and its effectiveness in improving maternal health. The area of study taken up is Barak Valley or Southern Assam. Assam had lagged behind in the achievements of maternal and child health parameters. The performance of the three districts of Southern Assam, better known as Barak Valley with respect to maternal and child health and healthcare parameters has been much lower compared to the rest of Assam. The majority of the Indian population lives in rural areas where public healthcare expenditure has been almost entirely channelized through National Rural Health Mission (NRHM). The per capita healthcare expenditure calculated on the basis of the population of that area is studied to find its effect on maternal healthcare parameters.

3 BACKGROUND OF THE AREA OF STUDY

Barak Valley is located in between Longitude 92’ 15 and 93’ 1 5 East and Latitude 24’8 and 25’8 North. The total geographical area of the Valley is 6922 sq. km. This constitutes 8.9 percent of the total geographical area of Assam. The region is surrounded by the state of Manipur in the East, Tripura and the country of Bangladesh in the west, Mizoram in the south and North-Cachar Hills and Meghalaya in the North. The Barak Valley mainly comprises of three districts- Cachar, Karimganj and Hailakandi. Of the three districts of the valley, Cachar is the largest district with 3786 sq. km., Hailakandi is the smallest district with total geographical area of 1327 sq. km and the second largest district Karimganj covers 1809 sq. km of the total geographical area.

Barak Valley has witnessed a remarkable increase in the growth of population. As per Indian Census reports, the population of Barak Valley has steadily increased by 20.94 per cent between 1961 and 1971 and by 30.1 per cent till 1991. This increased by 16.66 per cent in 2001 census and then further increased by 31 per cent according to 2011 census. The economy of Barak Valley is basically agrarian with 80 percent of population dependent on agriculture, paddy being the major crop. Agricultural infrastructure and modernization is sadly missing in the area. Based on local resources, the viable industries in the area are those based on cane, bamboo, pineapple and other agro-based industries.

In 2006 the Indian government named Cachar as one of India’s most backward district amidst a list of the country’s 250 most backward districts out of a total of 640 districts. The Assam Human Development Report (AHDR) 2003 states that in respect of Human Development Index (HDI), Cachar ranks eighth in the State with an index value of 0.402 which is marginally lower than the state index at 0.407. According to the Human Poverty Index, almost 30 percent of the population in the district is in poverty. The Gender related Development Index (GDI) for Cachar in 2001 is estimated to be 0.409, which is far less than the state average of 0.537.

The performance of Karimganj district in terms of the human development index as indicated by the Human Development Report of Assam (2004) for the district stands at 0.301 (ranks 19th in the state) which is much lower than the state average of 0.407. In terms of income, education and health the district ranks 19th, 14th and 18th respectively in the state out of its present 33 districts. On the other hand in gender related development index the district is placed at bottom in the state.

Hailakandi is one of the worst performing districts in terms of development in basic human capabilities in three fundamental dimensions viz., a long and healthy life, knowledge and decent standard of living, as indicated by its HDI value of 0.363 (11th rank) which is lower than the state average of 0.407. The district occupies 9th place in terms of income while 14th place in terms of both education and health in district wise rankings. The human poverty index calculated in 1999 indicates that 27 per cent of total populations in the district are in poverty. In terms of Gender related Development Index (GDI), Hailakandi ranks 6th in district wise ranking, with GDI value of 0.609 which, is above the state average of 0.537. However, the HDI-GDI rank disparities indicate that women in this district suffers from deprivation of development potential leading to lower achievement than men (Assam Human Development Report,2003).

4 METHODOLOGY

The three districts of Barak Valley (Southern Assam) are divided into their respective Block Primary Health Centres (BPHC). This is different from the administrative blocks under each district, as one single BPHC may cater to two adjacent villages falling under two different blocks. The data collected from the Block Primary Health Centres (BPHC) has been accessed through HMIS portal. The year-wise data on various maternal healthcare parameters are then studied to find the relationship (if exists) between public healthcare expenditure and maternal health outcomes. A regression analysis is done of the same. The null hypothesis taken is – public healthcare expenditure has a positive effect on maternal healthcare parameters.
5 RESULTS AND DISCUSSIONS

The relation between public health expenditure and maternal health has been examined by estimating the following regression model.

\[ \text{Msd}_i = \alpha + \beta_1 \text{Pce}_i + \beta_2 \text{Anc}_i + \beta_3 \text{Ipd}_i + \beta_4 \text{Iucd}_i + \beta_5 \text{Pnc}_i + u_i - - - - - - - - - - (1) \]

Where Msd\(_i\) indicates maternal safe delivery of child \(i\)th block in the Barak Valley region of Assam and \(t\) stands for time period.

\(PCex_i\) stands for the per capita public expenditure for \(i\)th block in that period, and
\(Z\)' indicates vector of other variables supposed to influence maternal safe delivery of child. A positive and significant value of \(\beta\) \(i\) (coefficient of \(PCex_{i,1}\)) would provide evidence for encouraging impact of public expenditure on health.

On the basis of the review of literature some other variables have been identified which can affect maternal safe delivery of child. These are: (a) Anti Natal Care (ANC). (b) Higher percentage of Indoor Patient Department which indicates Higher Institutional Delivery and Lower maternal death (IPD). Also stronger value of IPD to OPD ratio indicates stronger health infrastructure. (c) Use of temporary method of contraception, child spacing and Family Planning. Frequent pregnancies increase the chance of maternal deaths. This is represented by IUCD. (d) Trained management of post natal care crisis reduces the risk of death of the mother and infant after child birth (PNC).

Thus the final specification of the model

\[ \text{Msd}_i = \alpha + \beta_1 \text{Pce}_i + \beta_2 \text{Anc}_i + \beta_3 \text{Ipd}_i + \beta_4 \text{Iucd}_i + \beta_5 \text{Pnc}_i + u_i - - - - - - - - - - (2) \]

Where,

ANC- Completion of 3 Ante Natal Care indicates that the expecting mother is under complete monitoring and check-up which ultimately reduces the risk of maternal death. A positive and significant value of the coefficient indicates more chances of maternal safe delivery of children.

IPD- Higher percentage of Indoor Patient Department which indicates Higher Institutional Delivery and Lower maternal death (IPD). The expected relation of IPD with the dependent variable is positive. Also positive value of IPD to OPD percentage indicates stronger health infrastructure.

IUCD- Intra-Uterine Contraceptive Device is a temporary method of contraception for child spacing and Family Planning. Frequent pregnancies increase the chance of maternal deaths. This child spacing aspect is represented by IUCD variable. The relation with dependent variable is expected to be positive.

PNC- Trained management of Post Natal Care reduces the risk of death of the mother and infant after child birth. The better services by PNC will lead to maternal safe delivery. Another interpretation can be that, if Ante-Natal care and other requisite dietary care have been taken of the mother, the possibility of a normal, safe and healthy delivery increases and the requirement to avail post-natal crisis management services decreases.

The data used for the variables covers the period 2011-12 to 2015-16 on the basis of the availability of time series data for all the variables. \(u_i\) is disturbance term and assumed to be independently and identically distributed. The Redundant Fixed Effect (RFE) test is applied here to choose between the pooled OLS and fixed-effect methods. Rejection of pooled OLS method indicates that marginal effect of maternal health delivery system is not uniform across all the blocks in the Barak Valley region of Assam. The results are reported in Table 1.5.

<table>
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<tr>
<th>Table 1 : Results of Fixed Effect GLS Regression</th>
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<td>Coefficients</td>
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<td>(R^2=0.95)</td>
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<td>F-Stats</td>
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Note: (*) (**) and (***)) indicate significant values at 10%, 5% and 1% level.
*Cross-section SUR (PCSE) standard errors & covariance (d.f. corrected)
*Greater than lower and upper Durbin-Watson theoretical values at 5% level of significance

All the cross-section fixed effects are non-zero; as such presence of fixed effect is confirmed. However to confirm suitability of Fixed effect model, we perform Redundant Fixed Effects tests, the result of which is reported in Table 1.6.

The superiority of fixed effects model over the constant coefficients (pooled OLS) model is reinforced by the highly significant F-statistic. Also the computed value of Durbin-Watson test statistic in constant coefficient model indicates presence of positive autocorrelation when compared with theoretical value. The redundant fixed effects test shows whether fixed effects are necessary or not. As the estimated test statistics 35.01 is significant at the 1% level we reject the null hypothesis (per capita health expenditure and maternal healthcare outcomes are independent of each other). Hausman test has also been performed to confirm the suitability of fixed effect model. As expected the coefficients of all the independent variables are found to be positive and statistically highly significant except the variable PNC. However the variable has not been found to be statistically significant.
6 CONCLUSION AND SUGGESTIONS

Thus, it can be concluded from the above study that per capita public healthcare expenditure has a positive impact on maternal healthcare indicators in the area of study. Thus null hypothesis is proved true.

In a country like India, where majority of the population resides in rural areas and is economically backward, the Government plays a major role in the public provisioning of basic and vital life amenities of which health is of utmost priority. Ever since the inception of National Rural Health Mission (NRHM) in 2005, the rural healthcare sector has shown a significant improvement. The maternal healthcare parameters, which have been studied through this study, have also shown improvement. It is also to be noted that increasing public investment on health has become a major issue in developing country like India. So ascertaining the viability of such a huge facility is very important to know its success and to understand its self-sustaining capability. The study has proved that there exists a positive relation between public health expenditure and maternal health. Therefore when maternal health expenditure as a percentage of total public health expenditure falls, there is high possibility of a negative impact on maternal health and healthcare. This is evident when the trends of selective maternal health and healthcare parameters are studied. The trend lines either show a decline or an increase at a decreasing rate. Thus it can be said that as the focus of the public health investment shifts and the share of expenditure on maternal health facilities decrease, their performance in terms of health outcomes and care provisioning gets equally affected. This aspect proves that public healthcare provisioning has not yet achieved self-sustaining level and needs constant financial back support.

It has been observed that the various schemes introduced by the Government like i)Mamoni, an encouragement to Ante-Natal Care (ANC) and TT injection administration through financial assistance of two cheques of rupees five hundred each on giving two TT(Tetanus Toxoid) injections, as a sponsorship for the better nourishment and food intake of expecting mother). ii)Janani Suraksha Yojana (which provides a cash incentive of rupees fourteen hundred for every institutional delivery), iii) Mamata (gift incentive for the new born), iv) Morom (financial assistance to patients admitted in government hospitals as compensation for their loss of working days), v) Majoni (financial assistance to girl child, in form of bank fixed deposit), vi) Adoroni (medical assistance during pregnancy and ambulance facility during delivery) and similar schemes introduced in the rural areas have received positive response but are not reaching out to the needy on cent percent basis. So initiative should be taken to increase the number of beneficiaries under each of such schemes and prevent the leakages in the system.

The spread of education and awareness among rural people and specifically mothers shall go a long way in creating consciousness among them regarding the need and benefit of ante natal care and child immunization which will help to reduce the morbidity and mortality of the child and mother. Government should initiate steps and formulate policies to make the public healthcare system self-sustaining in the future. One of the ways is through spreading awareness and knowledge. If such governmental policies are designed and implemented which makes the healthcare system self-sustaining and maintains high standards of healthcare indicators even without the support of financial schemes and incentives, this will release an immense financial burden on the state exchequer.

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