A study on mothers and child health care services provided by health care centers in two districts of Assam.

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1.1 Introduction

It is seen that mothers' and children's health receive particular attention under the National Health Mission. Enhancing mother and child health care was a key component of the Sustainable Development Goals in 2015, in addition to the Millennium Development Goals in 2000. Many people believe that employing various maternity and child health care (MCH) services considerably reduces maternal and newborn mortality and improves mothers' reproductive health. The community health program prioritizes MCH services. The World Health Organization (1976) defined MCH services as "promoting, preventing, therapeutic or rehabilitation facility or care for the mother and child."

Thus, it can be concluded that maternal and child health services are essential to guaranteeing the mother's and the child's entire development. To reach the SDG targets, the top focus should be to accelerate the MCH's key coverage indicators (Sarah J. Hawkes, 2013). MCH services are provided under NRHM using the Primary Health Center (PHC) and Sub Center (SC) infrastructure, which serves as the cornerstone of the national health system. Even though NRHM has made several attempts to expand access to maternity and child care, these programs cannot be maintained or be successful unless equitable, effective, and high-quality services are offered locally. The effectiveness of NRHM programs for improving mother and child health in the study areas is examined in this paper.

1.2 Construction of Co-Coverage Index (CCI):

The **Co-coverage Index (CCI)** in the context of **mother and child healthcare** is a measure used to assess the level of simultaneous access to essential healthcare services for both mothers and their children. It helps evaluate how effectively maternal and child health interventions are being integrated and delivered together.

This index considers the overlap of two sets of health services:

1. **Maternal Health Services**: These might include prenatal care, delivery care, postnatal care, and family planning services.

2. **Child Health Services**: These services include immunization, infant and child care, nutrition, and growth monitoring.

The Co-coverage Index is typically expressed as a percentage and is calculated by comparing the proportion of mothers and children who both receive key health services. A higher CCI indicates better integrated or co-delivered healthcare for mothers and children.

For example, if a health system provides comprehensive care where a high percentage of both mothers and children receive the necessary services, the CCI would be high. Conversely, if there is a disconnect in the delivery of care between the two groups, the index would be lower.

The purpose of this index is to promote policies and programs that ensure mothers and children receive coordinated, holistic care, improving overall health outcomes for families (Nadia Akseer, 2016). Following are the eight interventions-

i) Antenatal Care visit (at least1+visit with skilled provider)

ii) 2 Tetanus vaccination during pregnancy

iii) Skilled birth attendant (includes doctors, nurse or auxiliary mid wife)

iv) BCG (tuberculosis)Vaccination

v) DTP3(diphtheria-tetanus-pertussis) Vaccination

vi) Measles vaccination

vii) Childhood vitamin A supplementation

viii) Access to improved drinking water in the household (including piped on premises, public standpipe, borehole, protected dug well, protected spring rain water collection).

As a result, every mother-child combination is assigned a score between 0 and 8. For mothers and children under the age of five, all indicators were computed. High coverage is defined as a mother-child pair receiving six or more interventions, whereas low coverage is defined as receiving fewer than three interventions (Fernando C Wehrmeister, 2016).

The Co-coverage index is helpful since it indicates the percentage of the population that is using all or the majority of the primary preventive measures. It may be a successful endeavor to enhance the health of mothers or children if they receive a small number of a series of life-saving preventive interventions (Cesar G Victora & Group, 2008). This co-coverage indicator is important in terms of human rights and activism. Only preventive actions that are recommended for all pregnant women and children in order to achieve universal health care are included in this co-coverage index (Fernando C Wehrmeister M.-C. R.-M., 2016). These are excluded from the co-coverage index since curative therapies are only necessary for sick children. The fact that the number of interventions covered in the co-coverage index might not be prioritized in every country is another drawback of CCI.

1.3 The Status of Co-Coverage Index in the Sample Areas:
Table 1.1 indicates that 47% of mother-child pairs obtain a CCI score of 6 to 8, which is considered strong coverage; 36% obtain a score between 4 and 5; and 17% obtain a score of 3 or lower.

Table 1.1: Profile of Co-coverage index in study areas

CCI	Percentage of mother-children's pair (%)
6 to 8	47
4 to 5	36
3	17

Source: Author's calculation

1.4. Factors Affecting Access to Various Maternal and Child Health Services Covered Under CCI:

The explanatory variables selected for this analysis are-

BPL (Below Poverty Line):
In developing nations, the impoverished in rural areas lack access to essential healthcare services for mothers and children. Poor women use ANC, professional delivery care, and other services far less frequently (Tanja AJ Howeling, 2007)Therefore, our analysis takes into account the women and children who belong to BPL families. A household is considered a BPL family if it has a BPL card and its monthly income is Rs. 2250 or less (Union Cabinet, India, 2016).

Education of mothers: The number of Ante Natal visits and the use of other essential maternal and child healthcare services are greatly influenced by mothers' education because they are more knowledgeable about the current health care system, have a more contemporary perspective on the world, are more comfortable interacting with officials, and are more willing to travel outside of their community. ((Berrera, 1990).

Education of husbands: In underdeveloped nations, husbands continue to be the primary decision-makers in the home, which has a significant impact on women's access to healthcare throughout pregnancy, childbirth, and the postpartum period. According to studies, fathers' higher education is just as important in gaining access to maternal and child health services in India as mothers' education. The economic standing of the home is directly impacted by the father's level of education, which in turn improves access to maternal and child health care facilities. (Choudhury,2015).

JSY beneficiaries: In order to lower MMR, the primary objective of JSY implementation in India was to encourage institutional delivery, particularly for women who fall into the BPL category. According to a number of studies, institutional deliveries have increased after JSY was put into place. The implementation of the JSY cash incentive has encouraged impoverished rural women to seek institutional delivery while also assisting them in overcoming financial obstacles. (Sanjeev K Gupta, 2012).

Guidance of Accredited Social Health Activists (ASHAs): A cadre of Community Health Workers has been established under NRHM to offer women and children health-related information, services, and issues in their homes. In general, CHWs are community members who are selected by their community and serve in their community to deliver culturally competent healthcare (Abimbola Olaniran, 2017). CHWs can offer care from the prenatal to postnatal stages, giving women adequate and easily available guidance on nutrition and sanitation practices, as well as pregnancy, childbirth, and postnatal care. They can also strengthen the connections between formal health services and communities (A. Wilford, 2018). ASHAs have been designated as CHWs under NHM, and they are working at the grassroots level to raise mothers' awareness of the different MCH services available. Research has indicated that CHW interventions, such as home visits and financial transfers, can enhance equality in access to MCH services, including as ANC, SBA, and immunization, for a range of educational and economic categories (Joel Blanchard, 2018).

A series of questions was posed to the respondents in order to learn more about ASHA's support in raising household awareness of the various maternal and child health care services covered by NHM. There are two or three mutually exclusive answers to each question, and each one is given a specific score on a scale of 2 to 0. Extremely good or favourable responses receive a score of two or one, respectively, while unfavourable ones receive a score of.

The Variation in CCI With Background Characteristics of Respondents:

When comparing the CCI with the respondents' background characteristics, table 5.5 shows that women with more education and husbands with higher educational positions (i.e., those in the "secondary education and above" category) have higher CCI scores. As women's and their spouses' levels of education decline, the CCI score gets smaller. Mothers in BPL families have a greater CCI score differential (3.78) than their non-BPL counterparts (6.85). It's interesting to see that JSY beneficiaries had lower CCI scores than non-JSY beneficiaries. Even though JSY is a modest government effort designed to improve the health care of pregnant women in rural regions, it was discovered that the women I saw did not do better on the CCI. Instead, non-JSY recipients have performed better, which could be because of a variety of likely causes, such as their higher educational attainment and better economic standing. Table 5.5 Mothers who receive the most ASHA assistance had better CCI coverage than mothers who receive less ASHA assistance. Village Health Sanitation and Nutrition Day (VHSND) is another commendable effort by NHM to address health issues, such as the proper nutrition and sanitation practices of mothers, children, and expectant moms. According to the study, those who had made full use of VHSND services scored higher on the CCI than their peers. Consequently, as we saw in the previous section, the co-coverage index is linked to socioeconomic level in addition to a few other parameters

Table 1.2 CCI with back ground characteristics

Background Characteristics	CCI
Education of mothers	
Secondary and above	6.81
Below Secondary	6.05
Primary	4.58
Illiterate	3.23
Education of husbands	
Secondary and above	7.1
Below Secondary	5.48
Primary	4.46
Illiterate	4.3
Belonging to BPL family	
Yes	3.78
No	6.85
JSY Beneficiaries	
Yes	6.41
No	6.74
Mothers assisted by ASHAs	
Highly assistive	7.69
Less assistive	5.65
Least assistive	3.13
Mothers who are attending VHSND meetings	
Highly assistive	7.67
Lower assistive	5.38
Lowest assistive	3.50

Source: Author's calculation

1.5 Results of Logistic Regression Model:

A Logistic regression analysis, is used to assess statistically the impact of selected factors on achievement of high CI scores by the pairs of mothers and children in sample areas. As after normalization the range of the CI score is from 0 to 1, therefore (simple linear regression model) logistic regression model has been formulated as-

$Y = 1/1 + e^z$

$Z = \beta_0 + \beta_1 MOTHEREDU + \beta_2 HUSBANDEDU + \beta_3 JSY + \beta_4 ASHA + \beta_5 VHSND + \beta_6 DIST + \beta_7 INCOME + U$ and $Y = CI$

Dependent Variable: Coverage Index (CI)

Independent variables: Mothers' educational level, Husband's educational level, JSY beneficiaries, Assisted by ASHAs, Attending VHSND meetings, distance and Log of Household income,

Table 1.3 An expected associations between the variables

Explanatory variables	Expected Sign
Log of House hold Monthly Income	+ve
Mother's education (Ref. illiterate)	
Secondary and above	+ve
Below secondary	+ve
Primary	+ve
Husband's education (Ref. illiterate)	
Secondary and above	+ve
Below secondary	+ve
Primary	+ve
JSY beneficiaries (Ref. not including in JSY)	+ve
Assisted by ASHAs (Ref. not assisted by ASHAs)	+ve
Attending VHSND meeting (Ref. not attending)	+ve
Distance to Health Centre	-ve

Ref. indicates reference category

Table 1.4 The Factors affecting co-coverage index: The result of Logistic regression

Logistic regression		Number of observations		= 109
		F (7)	=	67.83
		Prob> F 0.0000		=
Pseudo R2= 0.8909 Root MSME= 1.082				
Variables	**Coefficient**	**Standard Error**	**T**	**P>|t|**
Mother's Education	0.0880964	0.462983	1.90	0.060*
Husband's Education	0.0008002	0.002851	0.28	0.780
JSY	0.1423414	0.0267792	5.32	0.000***
ASHA	0.0119369	0.0137434	0.87	0.003**
VHSND	0.0406439	0.0128887	3.15	0.002**
Distance	-0.0093391	0.0022712	-4.11	0.000***
Income	7.70e-07	3.80e-08	20.28	0.000***
Constant	0.2797742	0.0399898	7.00	0.000***
Sigma	0.2797742	0.0399898		

13 left-censored observation at Censored score CCI <= 0.25

76 uncensored observations

19 right-censored observations at Censored score CCI >=1

Source: Author's calculation

Note: *** indicates significant at 1% level, ** indicates significant at 5% level, *indicate significant at 10% level.

The pseudo R^2 reveals that 89.09 per cent of the variation in health status is jointly explained by the significant variables. Among the independent variables, income of the respondent, assisted by ASHAs, JSY beneficiaries, attending VHSND meeting, distance to the health centre is found significant at 1 per cent level. On the other hand, mother's education and husband's education level are found insignificant and have no impact on the status of health in the study area.

Table 1.3 shows that there is a positive and significant relationship between JSY beneficiaries and health status, i.e. among the sample households, JSY beneficiaries have better health status. JSY reduces maternal and child mortality by promoting institutional delivery among pregnant women.

The guidance of ASHAs has significant positive impact on CCI. The mothers who are fully guided by ASHAs are tend to access significantly more MCH services than the mothers who were least or not assisted by ASHAs. In the same way, the CCI is significantly lower among the mothers who were least assisted by ASHAs in compared to those who were assisted by ASHAs to some extent.

VHSND is also emerged as a significant factor of achieving high CCI scores by mothers and children. The mothers who were fully assisted by VHSND services are tend to have more CCI in compared to those who were least assisted by VHSND services. Availability of VHSND services have a positive significant impact on health status of children and women. VHSND beneficiaries have more preventive and promotive health care facilities than their counterparts.

Distance to the health centre is negative and statistically significant relationship with CCI. It shows that smaller the distance from respondent's house to the health centre, more the CCI. Household monthly income is a positive and significant of CCI, indicating that for every one unit increase of income, the conditional mean for CCI increases. Higher income is usually associated with better nutritional status and medical services. Thus, higher income people have better health status and statistically significant relation with CCI.

Conclusion:

According to the current study, mothers' and children's access to MCH services is strongly and favourably correlated with their economic situation. MCH services will be more accessible to households with greater monthly income levels. On the other hand, we can state that moms from BPL households will have less access to MCH services. Prior research has also shown that impoverished rural residents in developing nations use fewer maternity and paediatric healthcare services. Poor women are far less likely to access services like ANC, professional delivery care, etc (Houweling et. al, 2007). According to the field study, even though mothers and newborns are given free access to MCH services under NHM, respondents still have to cover some sort of hidden fees. These include the cost of transportation to medical facilities, the purchase of medications and other necessities, occasionally unofficial payments to the providers, and the opportunity costs of the woman's and her companion's waiting, visiting, and travel time that could be used for other economic endeavours, among other things. Access to appropriate and sufficient MCH care in the research area is significantly impacted by each of these criteria.In the research area, a strong and favorable correlation has been found between a mother's educational attainment and her use of MCH services. The same conclusion—that is, a positive linear relationship between women's education and their use of maternity and child health services—has been shown by other research carried out in India and other nations. (Kriti Vikram, 2012).

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