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Health Issues of Mothers in Assam: An Analytical Assessment of National Family Health Surveys

By Abdur Rashid Ahmed¹

Abstract

Maternal mortality is one of the most serious public health concerns around the globe especially in developing countries like India. WHO estimated that almost 40% of pregnant women and 42% of children less than 5 years of age are anaemic globally and one-third of all women of reproductive age is also anaemic, and around half of maternal deaths in the world occur due only to anaemia. But the prevalence of anaemia among pregnant women in India has marginally declined as reported by the latest National Family Health Survey (NFHS). Using secondary data provided by NFHS, the study reveals that the maternal mortality ratio (MMR) in India as well as in Assam has declined sharply during the period from 1998 to 2018. The improvement in this maternal health aspect is associated with a drastic decline of all types of anaemia including mild, moderate and severe, which is also observed in the state of Assam. Additionally, the share of women in Assam who received maternal cares during various NFHS rounds shows considerable rise in terms of receiving Iron and Folic Acid (IFA) tablets, Tetanus Toxoid (TT) vaccine, antenatal care (ANC) and delivery assisted by health professionals. The study also finds that the proportion of moderately or severely thin women in Assam is greater than the national average whereas the proportion of obese and overweight women in the state is very less compared to the national level. Moreover, the consumption of nutritious food and iodized salt intake by Assamese women is satisfactory in the country.

Keywords: National Family Health Survey (NFHS), maternal mortality, MMR, Anaemia, Nutrition, Antenatal Care (ANC)

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Introduction²

The prevalence of maternal mortality is one of the most serious public health concerns around the globe especially in developing countries because more than half of the maternal death in the world is occurring in poor countries alone (WHO). The major possible causes of maternal mortality are pregnancy related health problems including anaemia, lack of accessibility to health care, poor nutrition and poverty, illiteracy, lack of proper sanitation, etc. (Stokoe, 1991; Bentley et al., 2003; Girum & Wasie, 2017). But maternal death may be caused by the detrimental outcome of the interaction of all or few of these factors. Hence, the major health problem in women especially among pregnant women is anaemia, the severity of which may lead to maternal death.

The WHO (World Health Organization) estimates, almost 40% of pregnant women and 42% of children less than 5 years of age worldwide are anaemic. In addition, one study conducted by WHO estimated that one-third of all women of reproductive age (women in 15-49 age groups) is also anaemic and around half of the maternal deaths in the world occur due to anaemia only (WHO, 2016). But the problem of anaemia is very prominent in South Asian countries especially in India where 80% of the maternal deaths of the entire South Asian occur in the country. In the last few decades, however, the prevalence of anaemia among pregnant women in India has marginally declined from 58% to 50% as revealed by the National Family Health Survey (NFHS) reports released by the Government of India (NFHS-3, 2005-06; NFHS-4, 2015-16).

However, to tackle all types of health problems, India launched National Rural Health Mission (NRHM) in 2005, a flagship health program in the whole country under the Ministry of Health and Family Welfare, to provide various health facilities particularly for the rural people of the country. Since its inception, NRHM has improved various indicators of health especially for mothers and children. Moreover, different states in India also undertook many schemes to revamp maternal and child health to strengthen the health services in their own state. In Assam, the state government launched numerous schemes regarding maternal health including Janani Suraksha Yojana (JSY) to provide free drugs and a sum of Rs. 1400 after delivery, Janani Shishu Suraksha Karyakram (JSSK) to provide free treatment during delivery and free transportation cost from to hospital. Besides, several schemes to provide financial aid to poor mothers were started by the state government including 'MAMONI (literally it means sweet daughter)' to provide nutritious food to pregnant women, 'MAJONI (literally it means beloved daughter)' for newborn girl child to safeguard them with the educational, health and nutritional needs and 'MAMATA (literally it means motherly compassion)' under National Rural Health Mission (NRHM) for overall well-being and welfare of children and mothers. These government schemes are quite successful while improving maternal health in the state.

Despite having a number of policies to improve the child and women health in India and Assam, most of them recorded poor success. The reasons behind the poor performance of the various women's and children's health policies launched by the government are the following: they are particularly technical in nature, lacking proper infrastructure, improper implementation, gender and caste discrimination, faulty strategies, and poor governance. Assam and other Indian states, nonetheless, have shown a tremendous success improving the level of nutritional status especially of children and women, through the quantitative improvement of medical facilities in the entire country. However, qualitative improvement of the coverage is much lower in Assam as well as in India.

² *JEL Classification:* I11; I18; I38

Thus, based on the above discussion, it is necessary to evaluate the all the available reports of the National Family Health Survey to understand whether India in general and Assam in particular were successful improving the maternal health in the country or not. The key objective of the paper is to assess the prevailing health status of women especially among pregnant mothers in Assam and to review the trend of improvement particularly from NFHS-1 (1992-93) through the latest report of NFHS-4 (2015-16).

Materials and Methods

This study is mainly based on secondary data provided by various National Family Health Surveys (NFHS) reports released by Ministry of Health and Family Welfare (MOHFW), Government of India (GOI). The National Family Health Surveys (NFHS) are conducted nationwide and it is based on representative sample of households throughout the country. The key objective of these surveys is to provide high quality data on population and health indicators especially the national and state estimates of fertility, infant and child mortality, reproductive and child health, nutrition of women and children, family planning, socioeconomic conditions of mothers and children.

There are four completed National Family Health Surveys in India. The First National Family Health Survey (NFHS-1) was conducted in 1992-93, and collected extensive information on population, health, and nutrition, with an emphasis on women and young children. The Second National Family Health Survey (NFHS-2) was conducted in 1998-99 in all 26 states of India with added features on the quality of health and family planning services, domestic violence, reproductive health, anemia, the nutrition of women, and the status of women. The results of the survey are currently being published. The Third National Family Health Survey (NFHS-3) was carried out in 2005-2006 covering all 29 states of India. Similarly, the Fourth National Family Health Survey (NFHS-4) was carried out in 2015-2016. All these NFHS surveys used standardized questionnaires, sample designs, and field procedures to collect data. International Institute for Population Sciences (IIPS), Mumbai, worked as the nodal agency for each of the four rounds of NFHS and funded by many international agencies namely, United States Agency for International Development (USAID), the United Kingdom Department for International Development (DFID), the Bill and Melinda Gates Foundation (BMGF), UNICEF, UNFPA, the MacArthur Foundation, and the Government of India.

Additionally, maternal mortality data reported by various issues of the Special Bulletin on Maternal Mortality in India published by the Office of the Registrar General, India under the Ministry of Home Affairs are also employed when needed. Moreover, this study employs bar diagrams, line diagrams, percentage, simple growth rate and compound annual growth rate (CAGR) to assess the various aspects of maternal health.

Findings and Discussions

Maternal Mortality in Assam

The intensity of deaths among women is discernible with the help of two widely used mortality indicators: the maternal mortality ratio (MMR) and the maternal mortality rate. According to the World Health Organization (WHO), the maternal mortality ratio (MMR) is defined as the number of maternal deaths (pregnancy related deaths) during a given time period per 100,000 live births during the same time period. But maternal mortality rate is defined as the number of maternal deaths (pregnancy related deaths) during a given time period per 100,000

women of reproductive age (women in the 15-49 age group) during the same time period. Hence, the MMR is the real indicator of maternal mortality on the basis of functional definition.

Figure-1 displays the trend of maternal mortality Ratio (MMR) in India and Assam provided by the Office of the Registrar General (Sample Registration System) under Ministry of Home Affairs (Govt. of India) during the period 1997-98 to 2016-18. The Figure-1 shows that the MMR in India has declined from 398 in 1997-98 to 113 in 2016-18 whereas in Assam it has declined from 586 to 215 during the same period. Thus, the trend exhibits a sharp declining trend with a negative compound annual growth rate (CAGR) during the same period which indicates that the MMR is improving by 7% in India and by 5% in Assam per annum (Table-1). In addition, the lifetime risk of maternal mortality in India also slowly declined from 0.11 in 1997-98 to a mere 0.03 in 2016-18, whereas it declined from 0.20 to 0.05 during the same period.

Figure-1: Trend of Maternal Mortality Ratio (MMR) in India and Assam

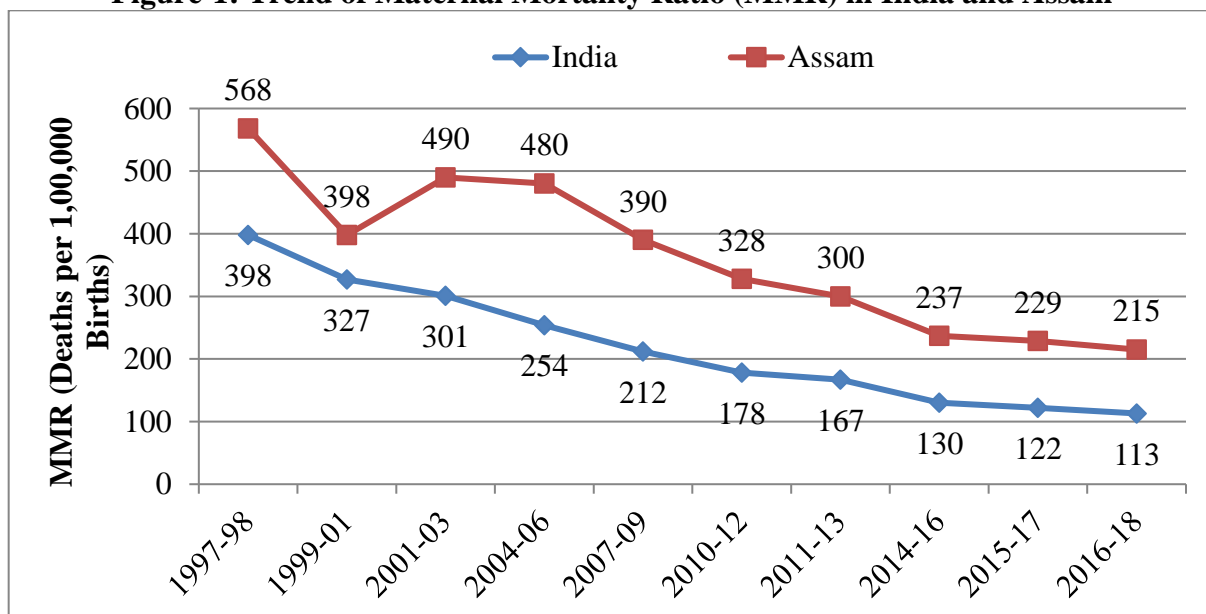


Table-1: Measures of Maternal Mortality in Assam and India

Year	MMR		Maternal Mortality Rate		Lifetime Risk	
	India	Assam	India	Assam	India	Assam
1997-98	398	568	34.8	63.4	0.11	0.20
1999-01	327	398	31.2	57.8	0.10	0.18
2001-03	301	490	27.4	52.8	0.09	0.17
2004-06	254	480	20.7	40.9	0.07	0.13
2007-09	212	390	16.3	31.2	0.06	0.10
2010-12	178	328	12.4	23.3	0.04	0.08
2011-13	167	300	11.7	19.6	0.04	0.07
2014-16	130	237	8.8	16.2	0.03	0.06
2015-17	122	229	8.1	15.2	0.03	0.05
2016-18	113	215	7.3	14.0	0.03	0.05
CAGR	-0.07	-0.05	-0.08	-0.08	-	-

Source: Sample Registration System (SRS), The Office of the Registrar General

Ministry of Home Affairs, Govt. of India

Hence, the maternal mortality in Assam is still alarmingly high and stands in the same position as other poor performing states of India, including the special focus states of the country i.e. the eight Empowered Action Group (EAG) states namely Bihar, Jharkhand, Madhya Pradesh, Chhattisgarh, Uttar Pradesh, Uttaranchal, Orissa and Rajasthan. However, the Government of India has been paying special attention and has been successful in reducing the maternal mortality ratio (MMR) drastically in these eight EAG states and eight Northeastern states (including Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura) as well as Himachal Pradesh and Jammu & Kashmir, only because of the proper accountability of the National Rural Health Mission (NRHM), the nation-wide flagship program on health, formally introduced in 2005.

Despite the vast improvement in MMR in India, it is still very high in relation to United Nations Sustainable Development Goals (SDG), which state that the MMR should be less than 70. Hence, India is lagging far behind in the MMR. There are many potential causes of high MMR. Significant among the causes are the poor socio-economic condition of the mothers and lack of nutritional food intake.

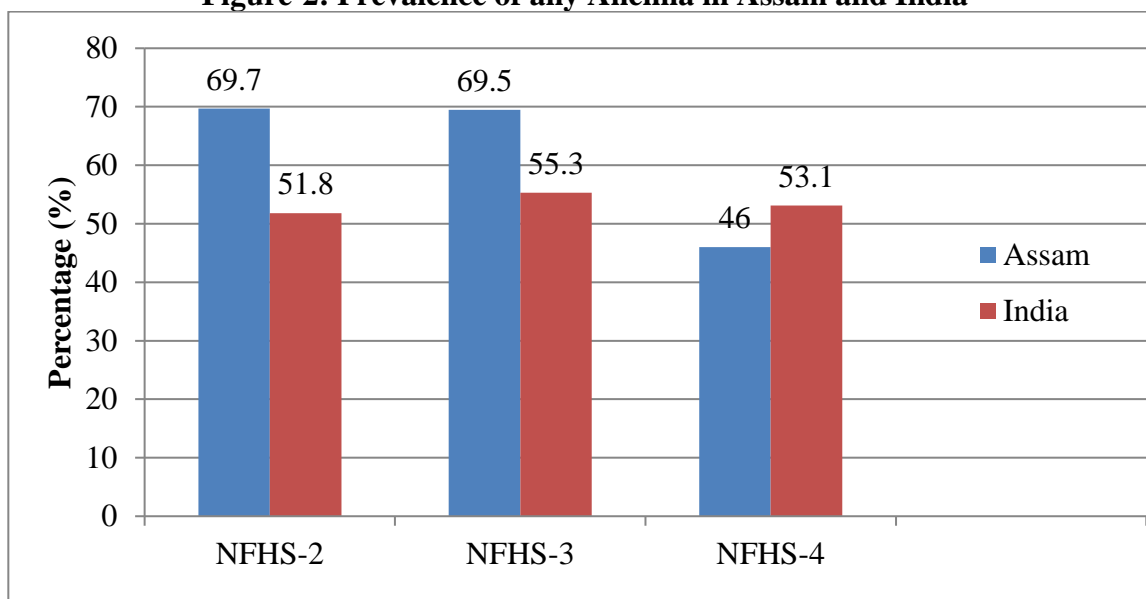
Anaemia among Assamese Women

Anaemia is one of the major and serious prevailing health problems in the world. It affects both men and women, particularly pregnant women and young children. Anaemia means “bloodlessness” in lay terminology. It is a serious health condition when the human body lacks the requisite amount of blood as compared to the minimum amount of blood needed to perform basic functions. In medical terms, anaemia is the condition when the haemoglobin count (concentration of red blood cells) is lower than normal level. Haemoglobin carries oxygen to the body’s cells and tissues supplying necessary nutrients. Hence, the presence of the right amount of haemoglobin count is vital for life, while the consequences of lower level of haemoglobin in body may prove to be life threatening, because without iron, hemoglobin cannot bind to oxygen, which is its primary role.

The most common symptoms of anaemia are fatigue, weakness, dizziness, and shortness of breath. That is why the optimal level of haemoglobin concentration is necessary to meet physiological functions which is again significantly varies by sex, age, smoking and drinking habits but it is very important to maintain the right level of haemoglobin concentration during pregnancy. Anaemia primarily occurs due to considerable iron deficiency in the body which is one of the most important causes and anemia in women occurs firstly due to periodic menstrual loss and secondly due to poor supply of iron in the diet. However, during pregnancy the demand of iron for the growing fetus and placenta in pregnant women also causes anemia. But it can be caused by many other reasons like haemoglobinopathies (disorder of red blood cells), infectious diseases (such as malaria, tuberculosis, HIV), parasitic infections and other nutritional deficiencies in folate, vitamin B₁₂ and vitamin A are also important causes of anaemia. Moreover, the educational level and other socio-economic factors of mothers may also be some of the causes of anaemia, because women from financially poor families, especially from rural areas lack access to nutritious foods and they do not have sufficient awareness about IFA tablets and their benefits. Thus, the preservation of optimal level of haemoglobin concentration in the body, particularly in pregnant women, and improving access to antenatal care, maintaining proper nutritious food supplements are crucial for women’s health. The Indian Council of Medical Research considers a person

anaemic if his or her haemoglobin (Hb) count is less than 10.9 grams per deciliter (i.e. g/dl). Again, to understand the severity of anaemia, anaemia is further classified into and mild anaemia (haemoglobin count between 10.9 g/dl to 10.0 g/dl), moderate anaemia (haemoglobin count between 7 g/dl to 9.9 g/dl), severe anaemia (haemoglobin count below 7 g/dl) as recommended by WHO and widely mentioned in various reports of National Family Health Survey (NFHS) of India.

Figure-2: Prevalence of any Anemia in Assam and India



As noted, anaemia is one of the serious health problems in the world, particularly among mothers and their babies, which may be a potential cause of high maternal mortality especially among pregnant mothers in Assam, and in the country as a whole. Figure-2 demonstrates that the proportion of anaemic women (including all types of anaemia like mild, moderate and severe i.e. Hb<11.0 g/dl) in Assam has drastically dropped from 69.5% in 2005-06 (NFHS-3) to 46% in 2015-16 (NFHS-4) unlike the national statistics, which remained almost same during the same period.

Table-2: Severity of Anemia in Assam during different NFHS rounds

Type of Anaemia	Mothers			Children		
	NFHS-2	NFHS-3	NFHS-4	NFHS-2	NFHS-3	NFHS-4
Mild Anaemia (10.0-10.9 g/dl)	43.2	44.8	37.1	31.0	28.7	23.9
Moderate Anaemia (7.0-9.9 g/dl)	25.6	21.2	8.3	32.2	38.7	11.4
Severe Anaemia (<7.0 g/dl)	0.9	3.4	0.6	0	2.2	0.4
Total Anaemia (<11.0 g/dl)	69.7	69.5	46.0	63.2	69.6	35.7

Source: National Family Health Survey, Govt. of India.

The severity of anaemic mothers in Assam, though, can be understood with the help of Table-2 which presents the relative status of anaemia among mothers and their babies during

different rounds of the National Family Health Surveys (NFHS). The proportion of anaemic children in Assam is significantly less compared to mothers, which is 35.7% as estimated by the NFHS-4 (2015-16) and shown in Table-2. Hence, children are less anaemic in Assam compared to their mothers. But Figure-3 indicates that the share of children being moderately anaemia is greater than the mothers having the same type of anaemia.

Figure-3: Comparison of Anaemia of Mothers and Children in Assam (NFHS-4)

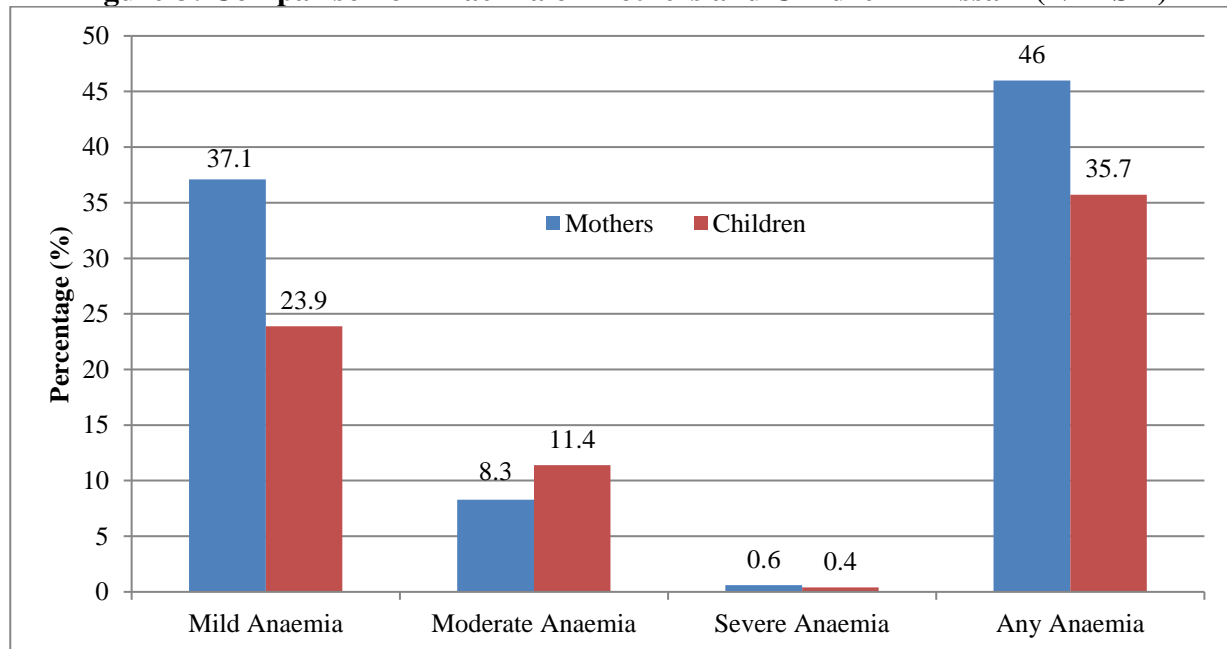
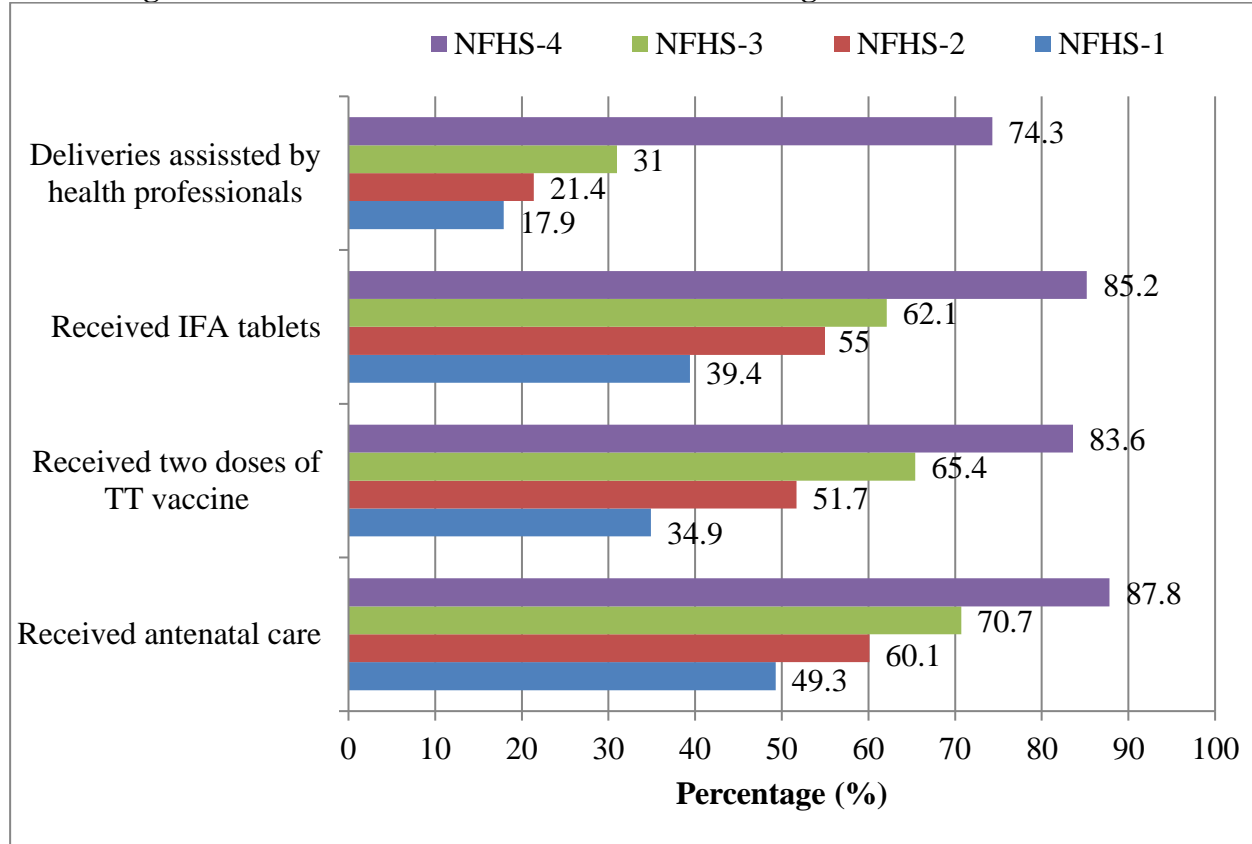


Table-3: Severity of Anemia in Assamese Women by different in categories (NFHS-4)

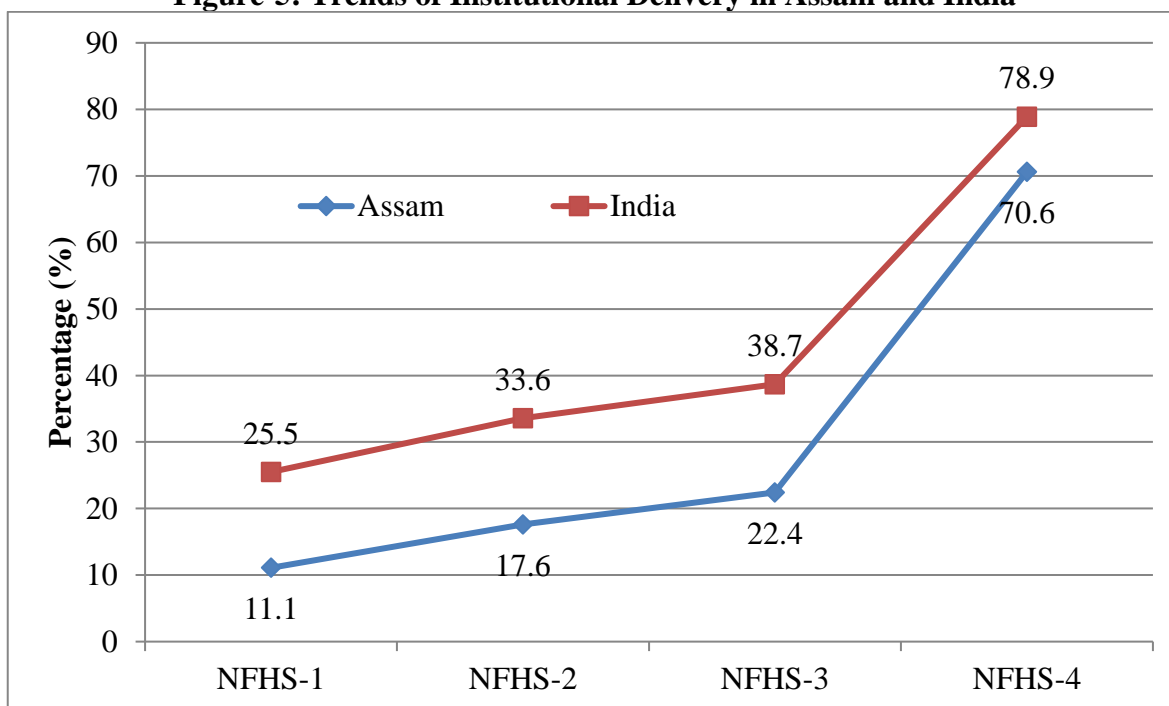
Categories	Mild Anaemia (10-10.9 g/dl)	Moderate Anaemia (7.0-9.9 g/dl)	Severe Anaemia (<7.0 g/dl)	Total Anaemia (<11.0 g/dl)
By Age Group				
15-19	34.4	7.3	1.0	42.7
20-29	37.1	8.1	0.5	45.7
30-39	36.5	8.9	0.6	46.0
40-49	39.7	8.6	0.6	48.9
By Marital status				
Never married	34.5	7.4	1.0	42.9
Currently married	37.5	8.5	0.5	46.6
Widowed/divorced/ separated/deserted	41.5	9.6	0.7	51.7
By Maternity status				
Pregnant	23.2	21.0	0.6	44.8
Breastfeeding	42.9	8.5	0.4	51.8

Neither	36.2	7.6	0.7	44.5
<i>By Residence</i>				
Urban	35.8	7.6	0.8	44.2
Rural	37.3	8.4	0.6	46.3
<i>By Mother's Education</i>				
No schooling	39.6	10.5	0.8	50.9
<5 years complete	37.9	9.4	1.1	48.4
5-9 years complete	36.2	7.7	0.6	44.5
10-11 years complete	35.7	6.8	0.6	43.1
12 or more years complete	35.8	6.8	0.3	42.9
<i>By Religion</i>				
Hindu	38.4	9.0	0.8	48.2
Muslim	34.1	6.6	0.4	41.1
Christian	41.6	11.6	0.6	53.8
Other	27.8	2.2	0.9	30.9
<i>By Caste/tribe</i>				
Scheduled caste (SCs)	37.4	9.2	0.9	47.5
Scheduled tribe (STs)	39.4	9.0	0.2	48.5
Other Backward Class (OBCs)	39.6	9.5	1.0	50.0
Other	34.7	7.2	0.5	42.4
Don't know	41.9	10.6	2.2	54.7
<i>Source: National Family Health Survey (2015-16), Govt. of India.</i>				

However, the severity of anaemia in Assamese women with different socio-economic and health conditions can be discerned in the above table (Table-3). The table shows that mild anaemia is a major problem in Assam, compared to moderate and severe anaemic situations, regardless of any socio-economic categories. It also shows that the anemia among the women with no schooling at all is very high compared to educated women. Moreover, women from rural areas, currently breastfeeding mothers and Christian women are more anaemic than others (Table-3).

Figure-4: Various Maternal Cares in Assam during different NFHS Rounds

In different circumstances, maternal mortality is also associated with other factors such as whether women received antenatal care (ANC), and the nature of care at the time of delivery in health facilities technically known as institutional delivery. The available components of ANC in India are deliveries assisted by health professionals, iron folic acid (IFA) tablets, tetanus toxoid (TT) vaccine, and antenatal care (ANC). The present status of antenatal care (ANC) and institutional delivery as received by Assamese mothers is outlined in Figure-4. The figure displays the proportion of women in Assam who received ANC during various NFHS rounds. The share of women receiving IFA tablets and TT vaccine has improved from 39.4% and 34.9% during NFHS-1 to 85.2% and 83.6% during NFHS-4 respectively. Similarly, the overall coverage of antenatal care also revamped from 49.3% during NFHS-1 to 87.8% during NFHS-4 (Figure-4). Moreover, the coverage of delivery assisted by health professionals has increased from mere 17.9% during NFHS-1 to 74.3% during NFHS-4 (Figure-4). Hence, all of these components of antenatal care have improved drastically from little coverage to more than 80% during NFHS-4. Similarly, institutional delivery in Assam is also improving significantly from a mere 10% during NFHS-1 to a high coverage of 70.6% during NFHS-4 (Figure-5). Hence, the coverage in Assam in terms of ANC is still lagging behind the national average. However, Assam registered a massive growth in relation to India during the same period.

Figure-5: Trends of Institutional Delivery in Assam and India

Women and their Physical Health in Assam

The BMI (Body Mass Index) is an indicator of nutritional health of individuals, which indicates the soundness of the physical body. The high BMI index value is one of the main causes of many health conditions like diabetes, hypertension, high cholesterol, stroke, heart disease, certain types of cancer, and arthritis in both men and women. Hence high risk of morbidity and mortality is associated with high level of BMI. National Family Health Survey estimated the mean BMI of women in India is 21.9 whereas it is 21 in Assam showing lacks nutritional health among Assamese women compared to the national average (NFHS-4, 2015-16). As estimated by the latest National Family Health Survey (NFHS-4, 2015-16) the proportion of normal BMI among women in Assam is 61.1%, which is marginally greater than India (56.4%). Figure-6 shows that the proportion of moderately or severely thin (BMI less than 17) women in Assam is greater than the national average. But the proportion of obese (BMI 30 and above) and overweight (BMI between 25 and 29.9) women in Assam is much less compared to the national level (Figure-6).

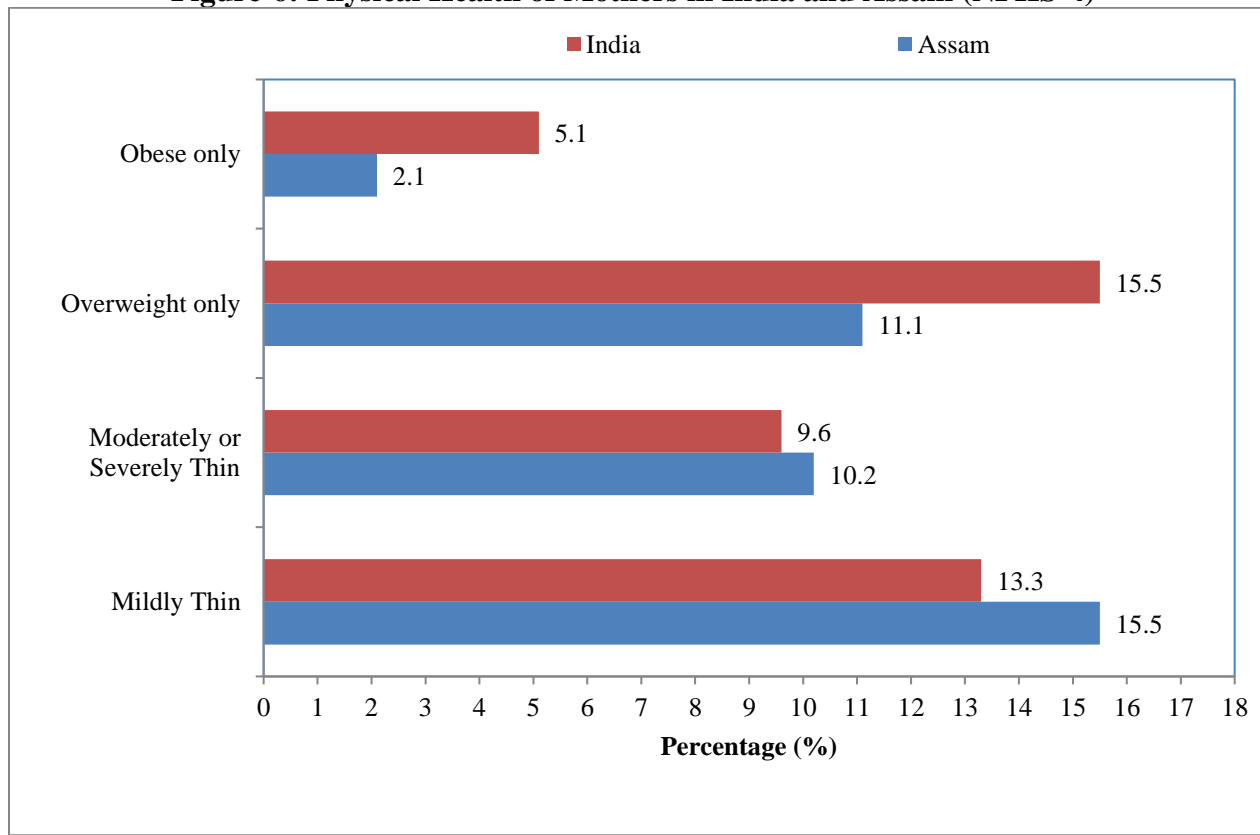
Figure-6: Physical Health of Mothers in India and Assam (NFHS-4)

Table-4 displays the latest physical health status of women in Assam by different categories as estimated by the latest National Family Health Survey (NFHS-4, 2015-16). It shows that the proportion of Assamese women are more likely underweight or obese if they are in 40-49 age group, currently married, living in urban areas and educated. But young women (15-19 age group), illiterate, unmarried women of rural areas are more likely moderately or severely thin.

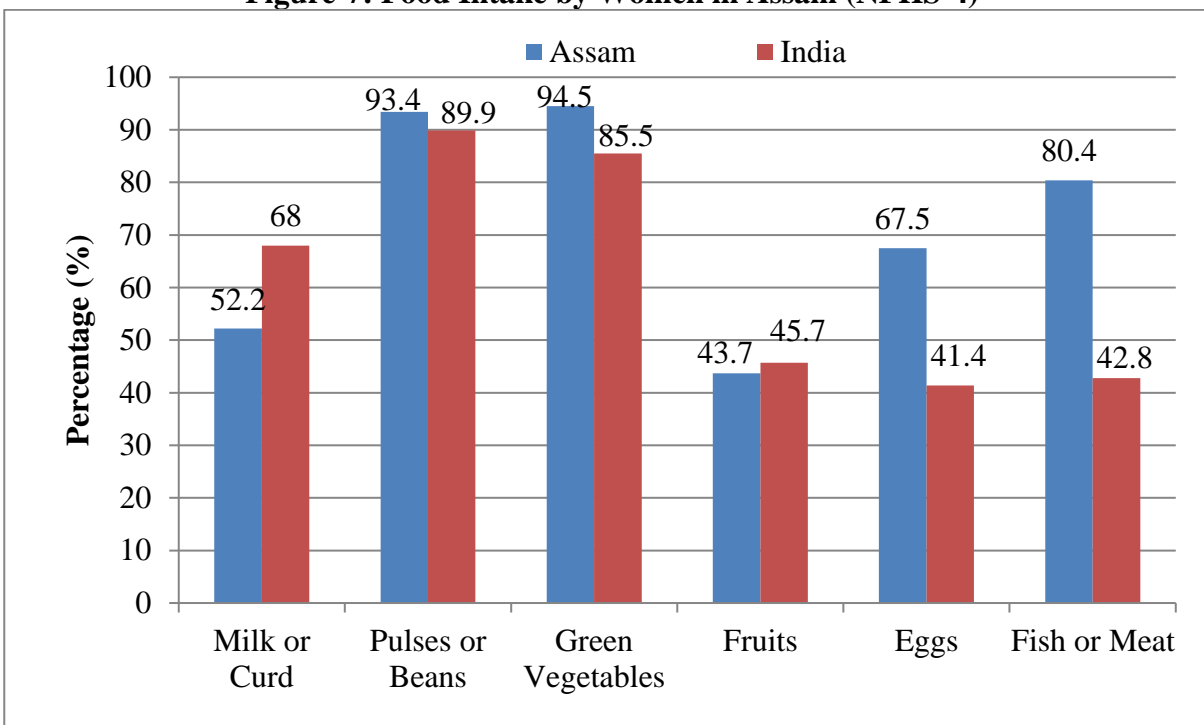
Table-4: Physical Health of Women in Assam by different categories (NFHS-4)

Categories	Total Thin (BMI<18.5)	Moderately Severely Thin (BMI<17.0)	or Overweight or Obese (BMI≥25.0)	Obese only (BMI≥30.0)
By Age Group				
15-19	38.8	15.6	3.4	0.6
20-29	26.4	9.9	10.0	1.3
30-39	20.9	8.3	17.2	2.5
40-49	20.9	9.1	19.9	3.7
By Marital status				
Never married	33.8	14.0	6.6	1.2
Currently married	22.8	8.8	15.3	2.3
Widowed/divorced/separated/deserted	27.6	13.1	14.0	2.4

By Residence				
Urban	17.9	7.8	26.1	6.0
Rural	27.0	10.6	10.9	1.4
By Mother's Education				
No schooling	33.1	13.9	7.3	0.9
<5 years complete	28.9	12.5	9.9	1.5
5-9 years complete	25.8	10.1	12.4	1.8
10-11 years complete	20.1	7.4	18.3	3.2
12 or more years complete	15.5	5.2	23	4.1
By Religion				
Hindu	24.6	9.9	14.2	2.2
Muslim	28.0	10.8	11.5	1.7
Christian	25.2	10.4	7.8	1.5
Other	19.6	7.6	19	4.2
By Caste/tribe				
Scheduled caste (SCs)	26.4	10.4	12.6	2.3
Scheduled tribe (STs)	14.4	3.6	14.2	1.8
Other backward class (OBCs)	27.6	11.9	11.9	1.6
Other	27.1	10.8	13.9	2.3
Don't know	43.4	20.0	7.6	0.5
Source: National Family Health Survey (2015-16), Govt. of India.				

Women and their Nutritious Food intake in Assam

Despite receiving timely antenatal care and institutional delivery, healthy maternal life is also the outcome of prevailing food habits among the population and other cultural practices. But Assam is known for its rich food culture, because of the presence to myriad tribal communities and religious creeds. This is why the consumption of nutritious food by Assamese women is satisfactory as compared to the national average except the intake of milk products and fruits. In addition, it's worthwhile mentioning that the consumption of non-veg food items is very high among Assamese women than the national average (Figure-7).

Figure-7: Food Intake by Women in Assam (NFHS-4)

In addition, iodized salt intake at least once in week, should be adequate, which technically indicates consuming more than 15 parts per million (ppm) for good nutritional balance in the body. Around 72% of the population in Assam consumes adequate iodized salt which is much above the national average of 51% (NFHS-4, 2015-16). Hence, iodized salt intake is also better in relation to the national average.

Conclusion

Different health indicators of India along with the state of Assam especially regarding maternal and child health aspects, significantly improved during the last couple of decades. The maternal mortality ratio (MMR) and maternal mortality rate in India as well as in Assam has declined sharply during the period from 1997-1998 to 2016-2018. These improvements in health sector of the country are accompanied by a drastic decline of all types of anaemia from mild, moderate and severe, which is also observed in the state of Assam. Mild anaemia is a major anaemic situation in Assam compared to moderate and severe anaemic situations regardless of any socio-economic categories. It is also found that the anemia among the women with no schooling at all is very high compared to educated women. Moreover, women from rural areas, currently breastfeeding mothers and Christian women are more anaemic than others.

The percentage of women in Assam received maternal care during various NFHS rounds showing that the proportion of women receiving IFA tablets, TT vaccine, antenatal care (ANC) and delivery assisted by health professionals has drastically increased from barely being covered to more than 80% during NFHS-4. However, the coverage in Assam in terms of ANC is still lagging behind the national average. While assessing nutritional health of the mothers, the study finds that the proportion of moderately or severely thin women in Assam is greater than the national average whereas the proportion of obese and overweight women in Assam is very less compared to the national level. But consumption of nutritious food by Assamese women is

satisfactory as compared to the national average except the intake of milk products and fruits. However, it's worthwhile to mention that the consumption of non-veg food items is very high among Assamese women than the national average. Additionally, iodized salt intake in Assam is also better in relation to the national average.

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