2012

Infant Mortality In Malda

Contents

Preface

This is an interdisciplinary group work for Krishna Raj Summer Travel Fellowship by six Masters students from three different courses of Delhi School of Economics – Ankita Sinha and Karmini Sharma from Economics, Debasree Banerjee, Moumita Biswas and Rishika Mukhopadhyay from Geography and Prama Mukhopadhyay from Sociology.

Based on our research objective we have selected the District of Malda in the state of West Bengal as our study area. Apart from the conventional causes behind infant mortality being prevalent, Malda was found to be an exceptional case where infant death of 20-25 has been reported in a single hospital on a particular day due to some non conventional causes. We tried to find out the causes behind infant mortality rate in the districts of Malda. We selected three blocks of the district where the rate of infant mortality was reported to be high. The study has been made interdisciplinary by interconnecting three different courses, Economics, Geography and Sociology.

Acknowledgement

Abstract

India is not only characterized by variations across states but also by large variations in demographic features in states and across districts. There have been quite a few previous studies which have looked into the causes of infant mortality but most of them have exclusively confined themselves to reasons such as mother's education, child's sex , urbanization level and birth order. Such studies however do not take into consideration other exogenous factors and policy interventions which might play a very important role in explaining infant mortality. For example the source of drinking water or sanitation facilities available in a particular area may not affect infant mortality on an "average" but it will definitely affect infant mortality among infants with highest risk of mortality.

A study done by the World Bank (2004) analysed the National Family Health survey (NFHS) data and found that infant deaths in India are most predominant in relatively small number of districts and villages. During the period 1994 – 99, 20% of the villages and 22.5% of the districts accounted for half the infant deaths in the country. Since the surveys were only conducted in a fraction of the villages with a small sample size such results could only be a rough indication of the actual condition at the district level. Thus it seems worthwhile to study a particular district in details and examine the factors pertaining specifically to that district.

This paper seeks to examine the shortcomings in the existing literature. The objective of this paper is to identify the factors affecting infant mortality in a particular district (Malda) and to undertake a thorough study on the unique and specific as well as the general factors which might be causing infant deaths in the district. This paper aims to give a deeper insight into the causes of infant mortality in Malda and how the situation in a particular district may be similar different from the current situation in the country as a whole.

The unit of analysis is the district level for two basic reasons : firstly there have not been too many studies on infant mortality at the district level, most of the studies have been undertaken at the state level. Moreover studying a particular district gives a better overview of the condition and helps in better understanding of the variation in the covariates. The study will be unique because it is the first paper to be written on the specific causes of infant mortality pertaining to Malda. The analysis would use simple econometric techniques and other qualitative methods to analyse whether infant mortality in Malda is caused only due to economic factors or do social factors also play an important role in explaining the phenomenon.

INTRODUCTION

INTRODUCING OUR RESEARCH PROBLEM

In the year 1998, about 2.5 million under-5-year-old children died in India, recording the highest total in any one single country in the history of children mortality rate of the world. Besides being the second most populous nation of the world, India today has also earned the ill fame of contributing to one-fifth of the total under-five deaths worldwide. Despite significant progress in infant and child mortality indicators in India in the last two decades, the under-five mortality rates continue to be alarmingly high even today as the brunt of high child deaths is borne mostly by the marginalized and socially disadvantaged section of the population.

As far as West Bengal is concerned, the state had consistently lower IMR than the national average. This was first borne out by the SRS estimates of IMR for the years 1982-1999 and has been further proved by the latest statistical data released by the census Commissioner from the Sample Registration System last year. (IMR of WestBengal-33, as compared to the national average of 50)

In spite of such an impressive success story of the state at large, reports of innumerable number of infant deaths occurring at various districts of West Bengal, especially Malda and Murshidabad, started flooding the national dailies from early days of November, last year. Most of the infants dying in these districts were either suffering from bronchopneumonia or were extensively under weight. As we started investigating government records, we were struck by the data provided by NFSH 3, which clearly highlighted a marked intra state IMR variation amongst the various districts of WB. For instance, it was found that Medinipore has the record of the most encouraging decline in under five mortality rate (35%) as compared to the state average of 33%, while the same for Malda and Murshidabad has been 18.5% and 22.3% respectively.

This preliminary exploration made us realize the emerging need to conduct a socio-economic and demographic study to understand the real cause behind these sudden outbursts in the media regarding an increased IMR in the Malda district of West Bengal which could either be due to certain socio economic factors or due to the lack of certain institutional infrastructural facilities or because of a combination of both.

Accordingly, we, a 6 member group, from the departments of geography, economics and sociology of Delhi School of Economics; decided to embark upon a field study, in the blocks of English Bazaar, Gazole and Kaliachak-III,of Malda district, which we had initially

gathered to be the three most affected blocks from our preliminary investigations. Our primary research question being; exploring the specific and unique factors, pertaining to malda which will give us a broader insight into the reasons behind the sudden increase in infant mortality in the district.

It however soon became clear, that English bazaar being the district head quarter, is not really one of the most affected blocks in Malda, even though a large number of infants have reportedly died there, owing to the positioning of the district hospital and medical college, there. Subsequently, under the assistance and guidance of a local journalist, we zeroed in on Habibpur as our third block for the survey.

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INTRODUCING OUR SITE OF RESEARCH: MALDA DISTRICT OF West Bengal
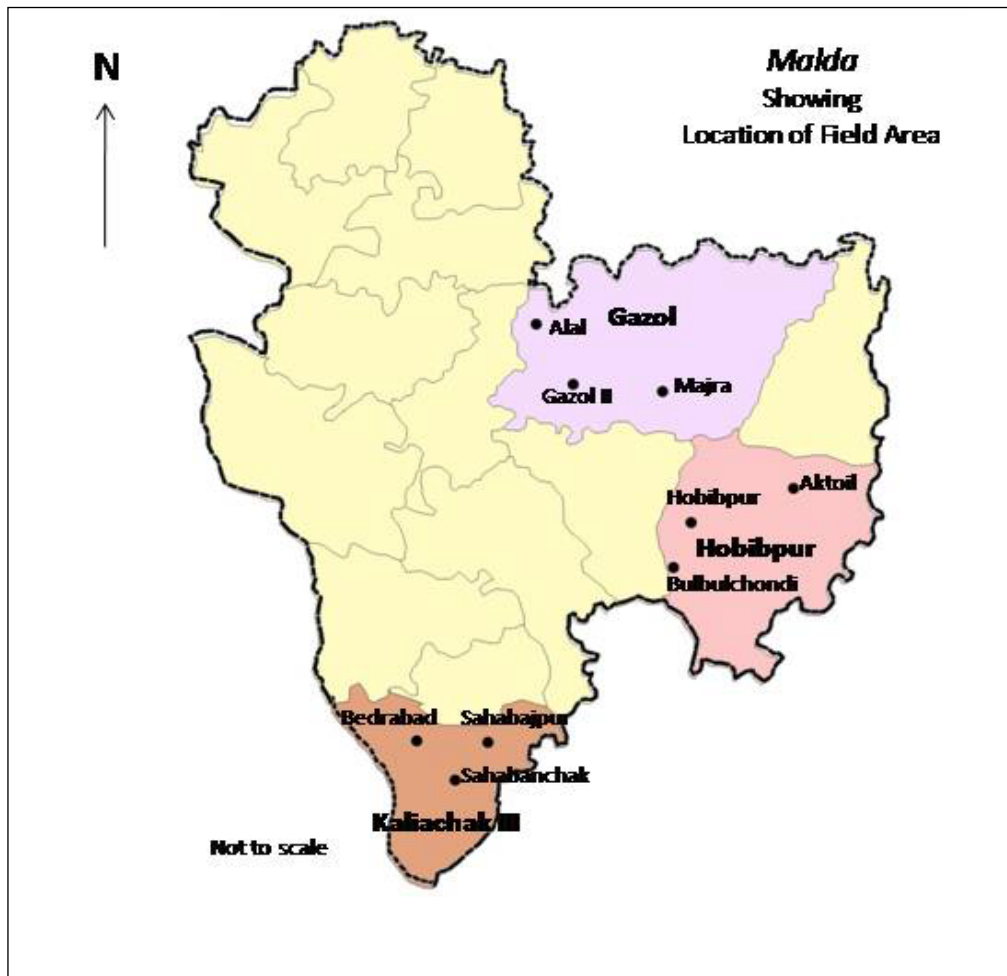
The district of Malda(lat range24°40'20" N to 25°32'08" N, and the longitude range is 87°45'50" E to 88°28'10" E.) , often known as the gate way of North Bengal, is washed by the waves of the river Ganges, Mahananda,Fulahar and Kalindri. A witness to the rise and fall of several dynasties right from the Pre- Gour era, the twin cities of Gaur and Pandua, situated within the borders of the district, were the capital of Bengal in ancient and mediaeval ages. Covering an area of about 3733 sq km the district has Murshidabad district to its south, North Dinajpur in its north, the international borders of Bangladesh to its east and the Santhal Parganas of Jharkhand and Purnea of Bihar in its west.

The district has been identified as one of the most under developed ones in the state, with a very low per capita income, low yield per unit area, poor industrialization, shortage of capital and entrepreneurship. The district has no known mineral resources and agriculture remains the main stay. The main agricultural products are paddy, wheat, jute and rabi-crops.

Malda occupies an important place in the map of the State for the production of raw-silk yarn. The annual estimated production of raw-silk yarn in this district is about 85% of the total output of the State which, if taken in terms of money amounts to approximately rupees 4 cores (40,000,000 rupees). Production of mango is another important aspect of Malda's economy. About 45,000 acres (180 km²) of land are covered by mango orchards which, in normal years, bear fruit to the extent of 3, 60,000 tonnes the value of which in money terms comes to about Rs. 5.5 cores (55,000,000 rupees). (All estimates of year 2000).

The district has 15 blocks ,most of which are an abode to a large number of religious minority(in comparison to 25 % Muslim population Of WB, Kaliachak-III, a block which we have studied, has a Muslim population of about 50%(as quoted by the Block Developmental Officer)), and Adivasi population(in comparison to the state average of 5.5%, Gazole, the second of the three blocks, upon which we had based our study, records a ST population of about 19.70%)

Another very important feature, that describes the land and its condition, is its ill fame of recording the highest number of child marriages in the state of West Bengal. We had presumed that this might have an effect, in the age of the mother at the time of conceiving, and could thus have an unpleasant effect on the district's infant mortality portfolio. Unfortunately, our presumption was proved to be quite accurate as we met numerous mothers of deceased infants, aged between 14- 16!

Malda also ranks amongst the six most arsenic affected districts of West Bengal, and we had presumed that this might have some sort of a negative impact on the district's health profile and result in an increased infant mortality.

Last but not the least, like all rural areas, people of Malda too, face the problem of accessibility of institutional health facilities, due to the availability of a very low number of Public health Centres and Sub health Centres in most of the blocks of the district, other than the dismal picture presented by the number of medical officials and staffs available in these medical clinics and the bed per person ratio.

REVIEW OF LITERATURE

Studies on Infant Mortality rate is not new nor counted in numbers. Yet, it was indeed difficult to find researched documents on the recent crib deaths occurring in Malda, as we had to depend enormously on newspaper reports. What we however did manage to find out is an extensive study carried out by several researchers of Princeton University on Health and Health care in West Bengal. This research intended to "explore the determinants of mortality and morbidity in West Bengal" highlights various health and health care data from the state and identifies potential area for improvement. This report, as most of the others on this topic, uses two key existing, broad based surveys - the India Human Development Survey (IHDS) and the National Family Health Survey (NFHS) for its secondary sourced data and manages to summarise the picture of West Bengal with reference to its health status, very efficiently. Besides, the article written by M. Claeson about REDUCING CHILD MORTALITY IN INDIA IN THE NEW MILLENIUM (published in 2007 edition of the WHO bulletin), Shruti kapoor's study on Infant Mortality rates in India: District level variation and correalation and the report by Arvind Pandey, Minja Kim Choe, Norman Y. Luther, Damodar Sahu, and Jagdish Chand, on behalf of International Institute for Population Sciences, Mumbai helped us in shaping our ideas and designing our project.

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CHILD MORTALITY PICTURE OF West Bengal

As has already been mentioned in the introduction, Data cited from NFSH-III show that infant mortality rates in West Bengal are lower than those for the rest of the India.(). They are however still quite high in comparison to other first world countries of the world. Overall, the infant mortality rate in West Bengal, at 46 per thousand births, is lower than the rate estimated for the rest of India from this sample. Urban areas in West Bengal suffer lower rates of infant mortality (estimated at 39 per thousand births) than either urban or rural areas in the rest of India. Rural areas in West Bengal face infant mortality rates of 48 deaths per thousand births.

From 1992 to 2005, infant mortality rates decreased across India and within West Bengal. Marked improvement can be seen in urban areas of West Bengal, where infant mortality dropped from 58 deaths per thousand births in 1992 to 39 deaths per thousand

births in 2005 – a decrease of 33 percent. Over the same period, urban areas in the rest of India saw only a 20 percent decrease. West Bengal's rural areas also improved, with infant deaths dropping from64 to 48 per thousand births, a 25 percent reduction, which exactly matched the rate decrease in rural areas in the rest of India.

Despite these improvements, West Bengal's IMR still remains higher than 16 other states of the nation, including Kerala, Himachal Pradesh, Karnataka, and Punjab.

CHILD NUTRITION MEASUREMENTS

Two measures of childhood development are commonly used to capture long- and short term malnutrition. Wasting is a marker of current food shortages or illness. Stunting is an indicator of long-term deprivation or past acute illness that has retarded a child's physical development. Rates of stunting and wasting are exceptionally high in India as compared to other countries and West Bengal's children experience a similar rate of stunting, compared to children in the rest of India, but the urban-rural split is worse here. The overall rates in West Bengal (38 percent) and India (37 percent) mask significant differences between rural and urban population. Rural children in both India and West Bengal are more likely to be wasted than children in urban areas. In West Bengal, nearly 42 percent of rural children aged five and under are stunted, as compared to 24 percent of urban children. The comparable numbers for the rest of India are 39 percent and 30 percent as reported by the NFSH-III.

DETERMINANTS OF INFANT MORTALITY

As most study cited on this issue suggests, understanding the determinants of infant mortality is a very important way to improve the IMR of any given place. This however often results into a confusion regarding what should be considered as the "typical determinants of infant mortality in India".

From our literature review, however, we managed to come up with few determinants, which are most likely to be considered as the most fundamental ones by most theoreticians and experts on this issue. These are:

> **The economic condition of the family the child is born into**:

Research has shown a strong link between income and health: the poor tend to be sicker due to worse living conditions, poorer nutrition, and less access to medical care.

> **The family's accessibility to the institutional health infrastructure and government health facilities:**

An attended birth in India has 21 percent lower odds of ending in an infant death than does an unattended delivery in otherwise similar circumstances. (data recorded from 'Improving Health and Health Care in West Bengal' 2011-2012)

> **The age of the mother at the time of conceiving:**

Infants born to younger mothers in India face greater mortality risk. Each additional year of mother's age at first birth is associated with a 13.6 percent decrease in the infant's odds of dying before his first birthday. (data recorded from 'Improving Health and Health Care in West Bengal' 2011-2012)

> **The mother's health and hygienic condition:**

Pregnant women, conscious about her health and hygiene is more likely to give birth to a healthy child, in comparison to her unconscious counterparts.

> **Breast feeding of the child:**

Breastfeeding an infant for at least six months has a large and significant negative impact on the odds of death for infants. In West Bengal, the impact was particularly strong: an infant who was breastfed for at least six months faced 93 percent lower odds of dying during infancy.(data recorded from 'Improving Health and Health Care in West Bengal' 2011-2012)

Nevertheless, we added a few more to our list, specific to the condition of malda, after going through NCPCR's report on COMPLAINTS OF NEO-NATAL DEATHS IN MALDA MEDICAL COLLEGE AND HOSPITAL, DEPRIVATIONS OF CHILD RIGHTS ON ACCOUNT OF GANGETIC CHARS. These being,

> The relation that might exist between **religion and infant mortality in the district.**

> The relation that might exist between the **various kinds of social customs and practices that are known to be prevalent in a rural, agrarian set up** like Malda, with that of its rate of infant mortality.

> The relation that might exist between the numbers of **child marriages taking place in the district** (one of the highest in the state) with that of its infant mortality portfolio.

Our intention thus, was to use these specific factors, other than the more conventional ones (as highlighted earlier in the proposal), to understand and explain the sudden increase in infant mortality in Malda district of West Bengal.

RESEARCH QUESTION

We hence formulated our research question thus:

Exploring the specific and unique factors, pertaining to malda which will give us a broader insight into the reasons behind the sudden increase in infant mortality in the district.

RESEARCH OBJECTIVE

Based on previous studies conducted, on this issue, we have identified few factors which are generally used to explain the reasons behind infant mortality. These are:

- Female literacy.

- Female labour force participation.

- Level of poverty.

- Birth order.

- Mother's nutritional status and the age at the time of conceiving.

- Access to governmental facilities.

However, since Malda seems to be an exceptional case, where around 20-25 children have been reported to die in a single hospital on a particular day, we presume that there might be certain unique factors, specific to the district which would be able to help us understand the sudden increase in infant mortality there. These factors, which we have been able to pin point are:

- **The presence of high number of religious minority in the district**. (In comparison to 25% of Muslim population in West Bengal, Kaliachak-III, has a Muslim population of about 49%.)

- **The presence of high number of Scheduled Tribe population**, which is far above from the state average of 5.5%. (Gazole, the second of the three blocks, upon which we would like to base our study, records a ST population of about 19.70%)

- The various kinds of **social customs and practices** that are known to be prevalent in a rural, agrarian set up like Malda, which might have an adverse effect on the health conditions of mothers and children in the district.

- The ill fame, that **Malda has gained, for recording the highest number of child marriages in the state of West Bengal**. We presumed that this might have an effect, in the age of the mother at the time of conceiving, and could thus have an unpleasant effect on the district's infant mortality portfolio.

- **The problem of accessibility to the institutional infrastructural facilities** which the people of Malda face, due to the availability of a very low number of Public Health Centres and Sub Health Centres in the various blocks of the district, other than the dismal picture presented by the number of medical officials and staffs available in these medical clinics and the bed per person ratio.

Thus, we would like to use these specific factors, other than the more conventional ones (as highlighted earlier in the proposal), to understand and explain the sudden increase in infant mortality in Malda district of West Bengal. This would hence be our research objective.

METHODOLOGY

Since ours is an **interdisciplinary group**, we tried, in this project, to merge qualitative methods with quantitative ones. We started our field work, trying to collect data from each of the three blocks, selected, namely Gajole, Kalichak-III and Habibpur. Being a group of absolute novices, we did not know initially how to proceed. It was at this point when Mr. Soumyo Dey Sarkar, a journalist of a local news paper came to our help. He introduced us to the BDOs of the respective blocks, who in turn made us acquainted with the BMOH (Block medical officer Health) of each of the blocks.

The BMOHs, posted in each of the block's Primary health centre, were very helpful and assisted us in understanding the basic structure of rural health set up.

Each block has a BPHC- Block primary health centre under which functions the Primary Health Centres and Sub Centres. These health centres however work in parallel with the ASHA workers (associated with the Janani Suraksha Yojana) and the Anganwadi workers (associated with the Integrated Child Development Scheme) trying to act as an interface between the community and public health system. It was from the PHNDs (Public Health Nursing Director) of these BPHCs, that we received detailed data about the gram panchayats most affected in the respective blocks. The data, which they had collected through the 'outreach programmes' conducted by the sub centres, also had the respective names of the villages tabulated, along with the names of the mother's whose child had died. This made our work, much easier as we could now start on with our survey without any further delay.

From the data available to us, we soon selected the three most affected GPs from each of the three blocks and from them villages most affected (1 to 3, as the case may be).

Thus, we came up with our sample:

BLOCK: GAJOLE

- GP: GAJOLE-2; ....VILLAGES: Malancha, Matoil
- GP: Alal..VILLAGES: Kadamtuli, Muriakundu
- G.P:Majra.....................................VILLAGE: Salbona

BLOCK: KALIACHAK-III

- G.P: SAHABAJPUR...............VILLAGES: Gopalgaunje, Nominpara
- G.P: SAHABANCHAK...........VILLAGES: Gopalpur, Sahajpalli
- G.P: BEDRABAAD................VILLAGES: Bhadutola, Dariapur, Baishnabgar

BLOCK: HABIBPUR

- G.P: HABIBPUR............. VILLAGES: Nityanandapur, Haldarpara
- G.P: AKHTOIL................VILLAGES: Perapur, Horinkhol, Rajarampur
- G.P: BULBULCHANDI....VILLAGES: Anandanagar, Kendua

It was thus not very difficult for us to locate the affected families in these villages, after which, we took a random sample and selected the un-affected families, from the same neighbourhood, where there has not been any case of child death in the last five years and does have a child below the age of 5 years in the household. Each of us, tried interviewing around 5-6 unaffected families in each village and many of us exceeded the number.

This is how we managed in fulfilling our endeavour of selecting a sample of 196 families, including 28 affected ones; who were then interviewed on the basis of semi structured questionnaires. The data thus generated was tabulated in a score table, for each household (where a score of 1 and 0 will be allotted to the specific indicators) and the 't'-test was then used for testing the differences in means of these two distributions (households with infant deaths and households without infant deaths). Based on this test, we finally came to a position, where we could either reject, or not reject the null hypothesis of similar means at any level of significance.

On the other hand, we had parallel conducted detailed interviews in an ethnographic style, with the help of semi structured interview schedule with as many affected families as possible,(case studies of a few given along with this report) along with people representing the health care system (including the members of ICDS and ASHA- Accredited social health activist) .

This was how we tried merging quantitative research methodology with a qualitative one, and in the process tried our best to come up with a research work which might be of atleast some importance in finding out the real reasons behind the reported increase in the rate of infant mortality in the Malda district of WB.

SOCIO-ECONOMIC FACTORS AFFECTING INFANT MORTALITY

Analysis and Hypothesis

A lot of previous empirical studies have been conducted on the causes of infant mortality in India as well as all over the world. In case of Malda the key determinants of infant mortality have been income, religion, caste, mother's age at the time of marriage, accessibility to government health facilities, mother's education level, infrastructural facilities and others. Besides other environmental factors like electricity, access to safe drinking water, sanitation facilities, cooking fuels seem to be playing a very important role in understanding infant deaths in the district. A recent World bank study on the role of public policy and service delivery to help India achieve its Millenium Development goals have found a strong association between i infant mortality and government health accessibility facilities and infrastructural facilities. Even in the case of Malda these factors do play a very crucial role.

The following table gives the descriptive statistics of the variables for the affected and unaffected households in the three chosen blocks based on the results of the field survey.

Table 1: Overall description of the sample according to variables

		AFFECTED			UNAFFECTED	
	HOBIB PUR	GAZO LE	KALIAC HAK	HOBIBP UR	GAZ OL	KALIAC HAK
RELIGION						
HINDU	9	4	6	57	25	29
MUSLIM	0	3	4	0	21	28
OTHERS	1	1	0	8	0	0
CASTE						
GENERAL	2	4	2	3	0	6
SC	3	3	4	4	3	8
ST	5	0	0	51	10	4
OTHERS	0	1	4	7	39	39

EDUCATION						
PRIMARY	2	6	0	29	21	19
SECONDARY	2	1	5	5	14	19
HIGHER SECONDARY	0	0	0	1	2	2
GRADUATE	0	0	1	0	0	2
ILLITERATE	6	1	3	31	9	0
OTHERS	0	0	1	0	90	15
MOTHERS OCCUPATION						
AGRICULTURE	3	6	0	27	8	0
SERVICE	0	0	0	3	1	0
BUSINESS	0	0	1	2	0	0
BEEDI MAKING	0	0	7	5	3	36
HOUSEWIFE	7	2	2	28	34	21
OTHERS	0	0	0	0	0	0
MEAN INCOME	2290	2212.5	3550	3774.6154	4565.217	5491.22807
MEAN AGE OF MARRIAGE	15.5	15.875	17	16.969231	16.15217	16.754386

For the analysis purposes we use the method of difference of means in order to determine the results. We divide the sample into two parts – affected and unaffected households. Affected households are defined as those households where infant death has taken place in the last five years, whereas unaffected households are those where no infant death has taken place in the last five years. We calculate the mean income of affected as well as unaffected households and then carry out a t- test for the difference in mean incomes. We take into consideration that our null hypothesis is that the mean income of unaffected households is equal to that of affected households. The results we obtained from the t-test are given as below:

Table 2 : t-test for difference in mean income for the entire sample

	Affected	*Unaffected*
Mean	2717.857143	4573.511905
Variance	2297076.72	9486554.659
Observations	28	168
Hypothesized Mean Difference	0	
Df	71	
t Stat	-4.986121095	
P(T<=t) one-tail	2.10141E-06	
t Critical one-tail	-1.645	
t Critical two-tail	1.993943341	

Thus from the above table it is clear that $t_{calculated} > t_{critical}$ and as such we reject the null hypothesis(at 5 %) and obtain the result that there is significant difference in between the incomes of the affected and unaffected households.

One tail test helped to conclude at 5% level of significance that the mean income for affected households was less than that of the unaffected households .Thus we may conclude that income may be a significant factor in explaining infant mortality. We cannot certainly say that income is a significant factor since we have not controlled for the other variables which might influence the result obtained.

Now to dwell deeper into the relationship between income and infant mortality we divide the population based on various attributes and then test for the equality of the mean incomes. We first do the analysis based on religion. We split the sample into three parts namely- Hindu, muslim and others and then carry out the t – test for the difference in mean incomes for all three groups separately. By doing this we may get an improved notion as to which religious group might be in particular causing the significant difference in means. The results for the t-test obtained in this case can be summarized using the following tables:

Table 3: t-test for the difference in mean income for Hindu households

	Affected	unaffected
Mean	2784.210526	4348.198198
Variance	3034736.842	7183314.906
Observations	19	111
Hypothesized Mean Difference	0	
Df	35	
t Stat	-3.301304433	
t Critical one-tail	-1.645	
P(T<=t) two-tail	0.00222192	
t Critical two-tail	2.030107915	

Table 4: t-test for difference in mean income for Muslim households

	Affected	unaffected
Mean	2314.285714	5316.326531
Variance	741428.5714	14267644.56
Observations	7	49
Hypothesized Mean Difference	0	
Df	43	
t Stat	-4.763975287	
t Critical one-tail	-1.681070704	
P(T<=t) two-tail	2.18427E-05	
t Critical two-tail	2.016692173	

Now in the case for both Hindu and Muslim households we get the result that $t_{calculated} > t_{critical}$. Thus in both the cases we reject the null hypothesis of equality of means(at 5%) and as such we can conclude as previously stated that income may be an important factor in explaining infant deaths not only in the sample as a whole but also in subsamples characterized according to religion.

Again one tail tests helped us in affirming that mean income of affected households is statistically lower than that of unaffected households at 5% level of significance.

Table 5: t-test for difference in mean income for SC households

Hypothesized Mean Difference	0	
df	15	
t Stat	-1.689076374	
t Critical one-tail	-1.729	
P(T<=t) two-tail	0.1118774	
t Critical two-tail	2.131449536	

Thus income is significantly different between affected and unaffected households belonging to scheduled caste category. However the one tail test does not lead to the rejection of the null hypothesis that the mean income of unaffected is less than the mean income of affected households.

Table 6: t- test for difference in mean income for ST households

	Unaffected	*Affected*
Mean	3759.230769	2062.5
Variance	5081944.712	1031250
Observations	65	8
Hypothesized Mean Difference	0	
df	17	
t Stat	3.728493206	
t Critical one-tail	-1.6	
P(T<=t) two-tail	0.001671173	
t Critical two-tail	2.109815559	

In this case also the null hypothesis is rejected for the one tail and two tail cases. Thus mean income of affected households is statistically lower than that of unaffected households at the 5% level of significance.

**Table 7: t-test for the difference in means for general households**

	affected	*unaffected*
Mean	3800	6111.111111
Variance	6200000	8611111.111
Observations	5	9
Hypothesized Mean Difference	0	
Df	10	
t Stat	-1.559288737	
P(T<=t) two-tail	0.149987586	
t Critical two-tail	2.228138842	

The similar kind of results holds in this case also.

The reason that income turns out to be such an important factor is that households with less income are less informed about health care issues. They have less resources and access to medical facilities and thus are not able to take proper care of their children and thus low income households have higher infant deaths on an average. Malda is one of the poorest districts of West Bengal and as such the low income of this region may be having a noteworthy effect on the increased prevalence of infant deaths in the district.

Moving on with the analysis another factor which seemed to have been playing a very important role is the age of marriage of the mother. Malda records the highest number of child marriages in West Bengal. The relationship between mother's age at birth and childhood mortality rates of the youngest mother's experienced the highest mortality risks). For biological reason of mother's health; it is observed that there is high risk of IMR in the case where the mother conceives at a very young age. The mother in most cases is undernourished and physically she is not prepared to give birth to a new life at a very young age and thus it increases the risk of infant death. Moreover getting married at an early age may lead to less educational opportunities which in turn lead to poor awareness among young mothers. Thus the social custom of child marriage seems to be a very important factor in explaining infant deaths. In the graph given below we have shown the number of child marriages in affected and unaffected households.

Child marriage with infant mortality
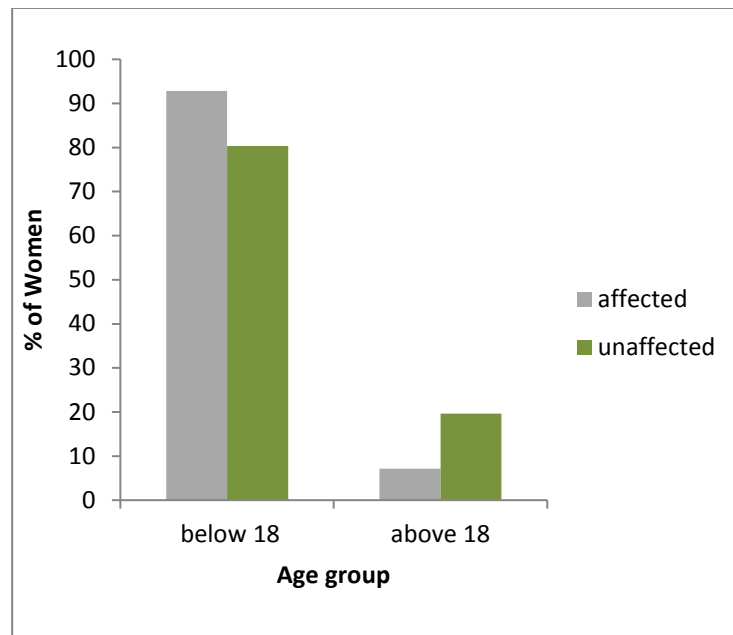
Now we can statistically test our results using the t-test for the equality of means as we had previously described. Our null hypothesis in this case would be that the mean age of marriage in affected households is equal to the mean age of marriage in the unaffected households. The results obtained are tabulated as follows:

Table 8: t-test for difference in mean age of marriage for the entire sample

	affected	*Unaffected*
Mean	16.03571429	16.67261905
Variance	7.739417989	8.221521243
Observations	28	168
Hypothesized Mean Difference	0	
Df	37	
t Stat	-1.116611645	
P(T<=t) one-tail	0.135679707	
t Critical one-tail	1.687093597	
P(T<=t) two-tail	0.271359414	
t Critical two-tail	2.026192447	

Here we observe that $t_{calculated} < t_{critical}$ (taking absolute values) and thus there is no evidence to reject the null hypothesis hence mean age of marriage for affected households is equal to the mean age of marriage in the unaffected households, and as such we may conclude that age at the time of marriage may not statistically be an important factor in explaining infant mortality. To further analyse the situation we conducted the t-test for hindu and Muslim households separately as well as for the various castes. The results we obtained can be summarized as follows:

Table 9: t-test for difference in mean age of marriage for hindu households

	affected	*Unaffected*
Mean	15.73684211	17.00900901
Variance	9.98245614	7.2999181
Observations	19	111
Hypothesized Mean Difference	0	
Df	23	
t Stat	-1.654598046	
P(T<=t) one-tail	0.055795103	
t Critical one-tail	1.713871517	
P(T<=t) two-tail	0.111590206	
t Critical two-tail	2.068657599	

Table 10: t-test for difference in mean age of marriage for ST households

	affected	*Unaffected*
Mean	16.25	17.10769231
Variance	2.785714286	11.62884615
Observations	8	65
Hypothesized Mean Difference	0	
Df	16	
t Stat	-1.181345491	
P(T<=t) one-tail	0.127363915	
t Critical one-tail	1.745883669	

P(T<=t) two-tail	0.254727831	
t Critical two-tail	2.119905285	

Table 11: t- test for difference in mean age of marriage for SC households

	Affected	*Unaffected*
Mean	14.75	16.26666667
Variance	9.071428571	4.352380952
Observations	8	15
Hypothesized Mean Difference	0	
Df	11	
t Stat	-1.270930596	
P(T<=t) one-tail	0.114986341	
t Critical one-tail	1.795884814	
P(T<=t) two-tail	0.229972682	
t Critical two-tail	2.200985159	

These results are not in accordance to our initial expectations. Theoretically mean age of marriage should be lower in affected households but here the data does not suggest so. One reason maybe that in rural areas there are quite a few other factors which might affect infant mortality which are not captured in our analysis. A lot of unexplained or omitted factors may be a reason for the equality of mean age of marriage in this case.

Here we do the analysis separately for schedule tribe and schedule caste households because it is worth investigating whether the caste system has a particularly strong association with the age of marriage. Scheduled castes and scheduled tribes are Indian population groupings that are explicitly recognized by the constitution of India as being previously "depressed". While SC, ST households are relatively poor in most states this poverty and lack of resources available to them may be a reason for higher infant mortality in this case; but this is just one side of the coin. Previous studies conducted by Basu(1990) , Miller(1981) have shown that SC,ST households have a higher value for women and this might cause lower infant deaths among SC/ST. But in our case the difference in mean age of marriage is insignificant in all the above classifications.

F tests were used to test whether the variance of the two populations (differed in or not assuming the null for equality. The tests confirmed that the null could be rejected and hence all the tests have been the two population tests assuming different variances.

Using the government facility accessibility index

The health facility questioned was primarily where the households had had the delivery for their babies .Many of these had delivery at home while others at the nearest hospitals. For most of them ICDS centres remained the nearest and most frequented government facility.

A list of six questions was asked from each household to form the government facility accessibility index which was asked primarily for the nearest hospitals and ICDS centres. The responses of each household was categorized into no problem, problem and big problem with scores of 0,1 and 2 respectively. The scores for each household were then added to get at the index score. The scores could range from a minimum of 0 to a maximum of 12.Scores from 0 to 3 were categorized as higher accessibility ,from 4 to 8 as medium accessibility and from 9 to 12 as very poor or low accessibility for the households.(Higher the score higher is the perception of difficulty. From our observations we could conclude that, the affected households perceived a much greater problem in distance to the nearest health facility while for unaffected households the biggest problem faced was with regards to reaching the facility but distance came in at a close second.

The key results are stated as follows

Affected and unaffected households with accessibility scores

The index scores for affected and unaffected households was calculated and proportions calculated as in the table below to carry out the test of proportion thereafter.

Table 12: Table for calculating proportions

Accessibility	Number of Affected households	Corresponding proportion	Number of unaffected households	Corresponding proportions
High	11	0.55	131	0.823
Medium	7	0.35	46	0.289
Low/poor	2	0.10	4	0.025
total	20	1.00	159	1.00

Hypothesis testing using t-test for proportions was used to find out whether there was a difference in the proportion of affected and unaffected households in the three categories of index.

1) Null hypothesis assuming equality in the proportion of households within the affected households with high accessibility and the same proportion for the affected households was rejected at 5% ,10% and 15% level of significance .The one tailed test led to the non rejection of the null that the proportion for affected category with perception of high accessibility will be greater than that for unaffected households at 5,10,15% significance level.Apriori we would have assumed that there should have been a rejection of null,but the results are can be strongly influenced by our choice regarding what high accessibility really is.

2) The two tailed test of the same kind were done for proportions in medium accessibility .The results depicted that the equality of proportions could not be rejected at 5 or 10% level of significance. The results were the same for low accessibility as well.

Muslim and non Muslim households with accessibility scores

We divided the data into those Muslims and non Muslim households disregarding the fact whether it was affected or unaffected and the following data was observed

Table 13: calculation of proportion for muslim households

Accessibility	Number of households(Muslims)	Proportion of Muslim households	Number of households(Non Muslims)	Proportion of non Muslim households
High	28	0.56	107	0.829
Medium	19	0.38	35	0.2713
Low	3	0.06	3	0.023
Total	50	1.00	129	1.00

Hypothesis testing using z test for proportions was done

1) Testing for high accessibility, two tailed test for equality of proportions, depicted that the null assuming equality could be easily rejected at both 5% and 1% level of significance. One tail test with the null being that proportion of Muslim households with high accessibility would be greater than or equal to that for non Muslim households showed that the null could be easily

rejected at both 1 and 5% level of significance. This is a significant result as a priori we had believed that high Muslim population could be one of the reasons for explaining high mortality in the district given the fact that Malda has a high Muslim population.

2) Two tailed l test as above albeit for medium accessibility led to non rejection of the null hypothesis of equality in proportions at 5 % level of significance.

3) Same results as above held for low accessibility as well.

To infer the reason for the result in 1 above, we looked at the index scores for Muslim households and found out that the lowest scores were given to the following questions:

Questions: count	Count of 0	Count of 1	Count of 2	Total score
Distance to the nearest health facility /Hospital	26	13	11	35
Reaching the facility	25	15	12	39
Availability of drugs, nurses and vaccination	33	9	7	23
Assistance during pregnancy	28	12	3	18
Waiting time to get treated(Queuing)	19	17	7	28
Quality of service	18	15	4	23

The highest scores being for question number 2 shows that the maximum problem was faced by majority in reaching the facility. This question has also one of the highest count for the response of big problem indicating that these households are for some reason finding it difficult to reach the nearest government health facility. Second highest score is also for question 1 being the distance to the facility. The other three questions however had much lower scores, indicating that once the people reach the facility they find the services satisfactory however the major problem they are facing is at the point of time when they have to reach the facility.

Using the result in 1 above ,it can give us an indication of the fact that there could be underlying economic factors that les the Muslim households to believe or perceive that the accessibility to the nearest government or health facility for them was not high enough. However the mean income of Muslim households came out to be higher than that of the non Muslim household's .Testing for the significance of this difference,

Reservation and non reservation with accessibility scores

Households belonging to the scheduled caste and scheduled tribes were included within the reserved category and the rest were a part of the non reserved category.75 households belonged to the latter and 103 to the former. Out of the 103, 75 households belonged to the ST category, which is nearly 73% of the entire number in this category. Key results are as stated follows:

Table 14: Calculation of proportion for reserved households

Accessibility	Number of households(reserved)	Proportion of reserved households	Number of households(Non reserved)	Proportion of non reserved households
High	73	0.708	45	0.6
Medium	28	0.2718	26	0.3466
Low	2	0.019	4	0.053
Total	103	1.00	75	1.00

1) Two tail test for proportions in the two categories with high accessibility provided with the result that the proportions were significantly different from each other albeit at 15% level of significance. One tail test with the null being that proportion for reserved category is greater than that of the other could not be rejected at 5, 10 or 15% level of significance.

2) The two tailed test for low accessibility however depicted that the equality of proportions could not be rejected at 5, 10 or 15% level of significance.

The reason why we get the result as in 1 above could be because of the sample itself .However inspection of the raw sample data itself suggests that reserved category households have a greater proportion of households with a high accessibility than those in the other category.

During the field survey we experienced and concluded that the ST households had a higher level of awareness about the government facilities in general. Since above analysis has an inherent feature of perception by the households, it could be the case that this general awareness amongst ST's translated into the results in 1 above.

Income with accessibility scores

We also divided the households into low and high income by using the medium income which was 2000 rupees. Households earning above 2000 were taken as high income households and those below 2000 as low income households. The results obtained were as follows.

Table 15: Results of proportions

Accessibility	Proportion of High income households	Proportion of Low income households
High	0.707	0.6125
Medium	0.272	0.3375
Low	0.002	0.0500

1)The two tailed tests for all the three categories(high medium and low) to test for the equality in proportions was not rejected at 5%,10 or 15% level of significance .Hence it was difficult to test whether income was affecting perception regarding accessibility or not.
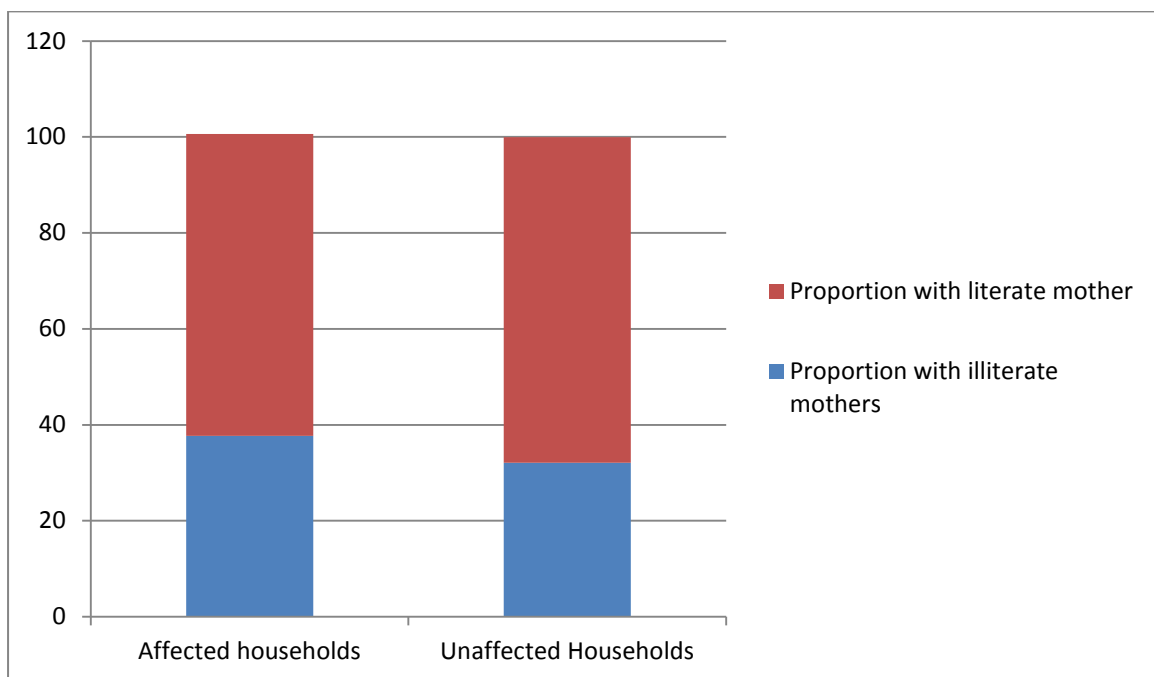
Test of proportions for mother's education among the affected and unaffected households

Table 16: Results from the sample

| Education	Affected	Proportion	Unaffected	Proportion
Illiterate	10	0.371	54	0.3214
Literate	17	0.629	114	0.6786
total	27	1.00	168	1.00

Households where the mother's education was not known were excluded for the analysis above.

The two tailed test for equality in proportions was rejected at 1 and 5% level of significance. The one tailed test with the null being that the proportion of illiterate households would be greater for unaffected households would be greater than affected households was rejected at 5% level of significance. The p value associated with this was nearly 0% meaning that we can conclude that the proportion of affected households with illiterate mothers was statistically much greater than that for unaffected households. This was also a priori expected. Thus mother's education has an important bearing of infant mortality in Malda.

Test of proportions for mother's occupation and infant mortality

A description of the data so obtained
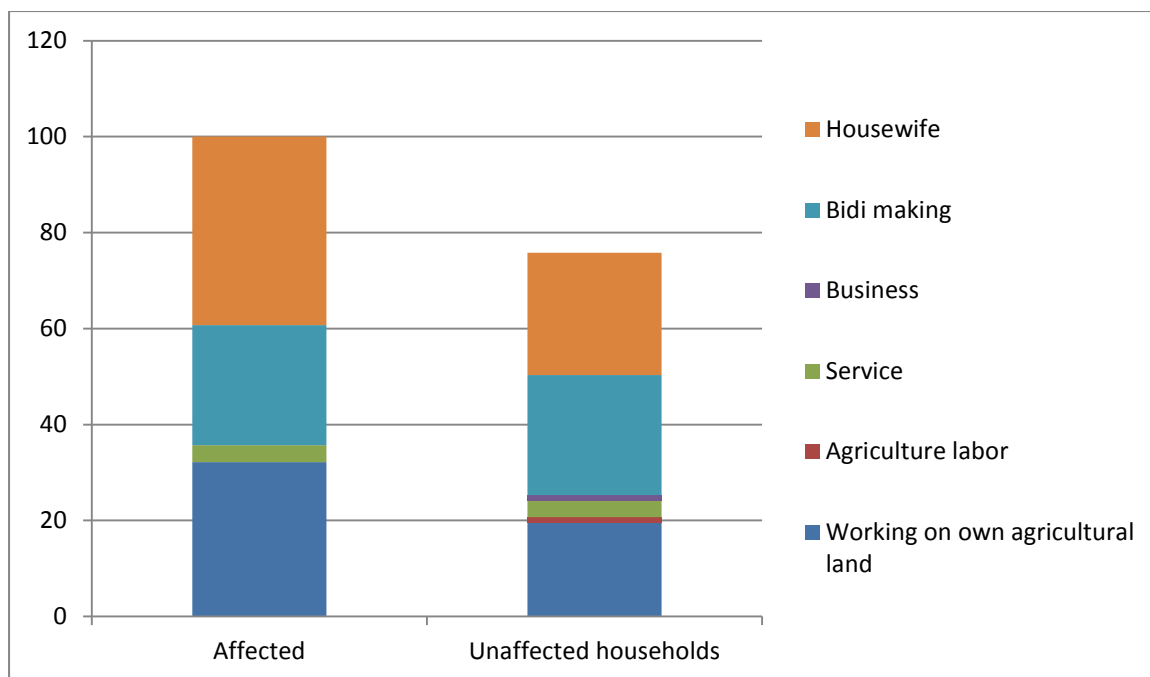
The data above depicts the occupation for the mother as at the time of the interview and not at the time when the birth of the child took place.

We divided the data into whether a motherwas housewife or not for affected and unaffected households using data above,which led to the following data

Category	Proportion with working mothers	Proportion with non working mothers
Affected	60.72%	39.28%
Unaffected	74.5%	25.5%

1) To test whether infant mortality was related to the fact that a mother was working or not using the test of proportions showed statistically insignificant results. Hence we could not reject that the null that the proportion of working mothers among affected households was equal to that in unaffected households at 5, 10 or 15% level of significance.

2) Since proportion of households for affected and unaffected with mothers in bidi making, agriculture labour, service, and business sector was more or less the same and involved a very few number of households of the total we decided to do the analysis for occupation of housewife and agriculture work on land category only. The two tailed tests for equality of proportions however led to non rejection of null at 5,10 or 15% level of significance.

Thus we concluded that mother's occupation might not be having a statistically significant impact on infant mortality and this result could be strongly due to the peculiarity of the data itself.

## RELIGION AND ITS RELATION WITH INFANT MORTALITY
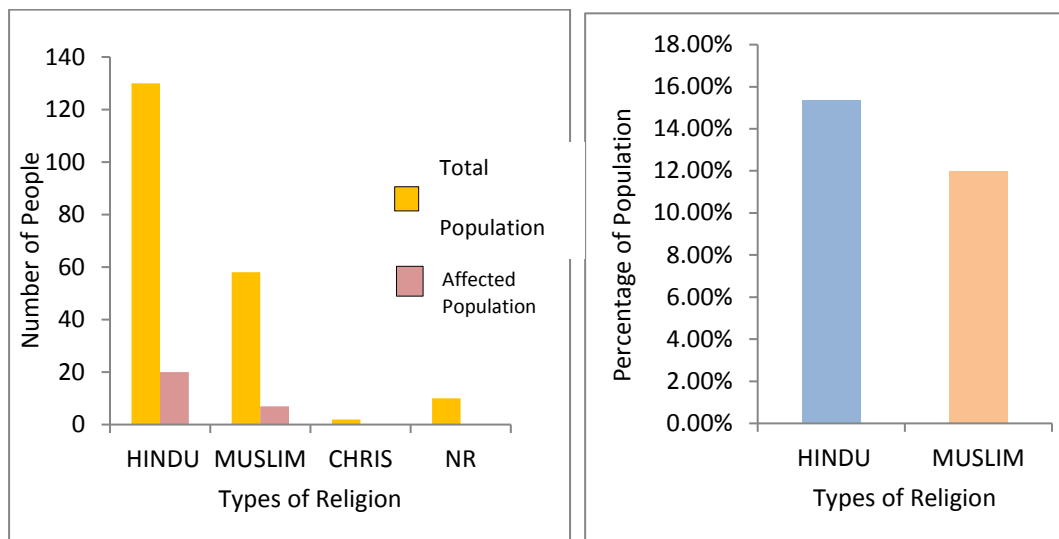
Religion was idenfied as an important factor while analysing the demographic pattern of our sample. Our total sample size was 196. Among which 54 was from Gazol, 75 from Habibpur and 67 from Kaliachak III. The three most distinguishable religioous group in the total area were Hindus, Muslims and Christians. From the bar graph it is clearly visible that Hindu is most dominant Religion of the sample. After that comes Muslim; and Christian occupies the lowest ratio among all the religion. The data also portrays, that amomg the sample of 196 families 130 are hindus 58 are muslims and only 2 are Christians. Such distribution may be found due to the Majority of Hindu population in the two blocks of Gazol and KaliachakIII. Only the sample drawn from Habibpur was a muslim dominated one, the christian population probably also belonging to the tribal group.

Among 196 sample families we found 28 affected families who have experienced child death. The distribution within these families also showed that, Hindus constituted the largest portion while Muslims were at the second position. Among all the affected families almost 16% belonged to Hindu religion and 12 % belonged to Muslim. From this data we can say that probably because our sample is Hindu dominated, have we have found the percentage for Hindus to be little higher than the Muslims,but the difference is of not a very significant amount.From this we can conclude both the Hindus and the Muslims have almost an equal amount of child deaths and religion is not really an importnt determining factor for infant mortality as it is was assumed by us initially. But this result might not be applicable to

the entire population, for the results are only based on our sample, which might not be an absolute representative of the population in real.

MOTHER'S EDUCATION AS AN DETERMINING FACTOR OF INFANT MORTALITY
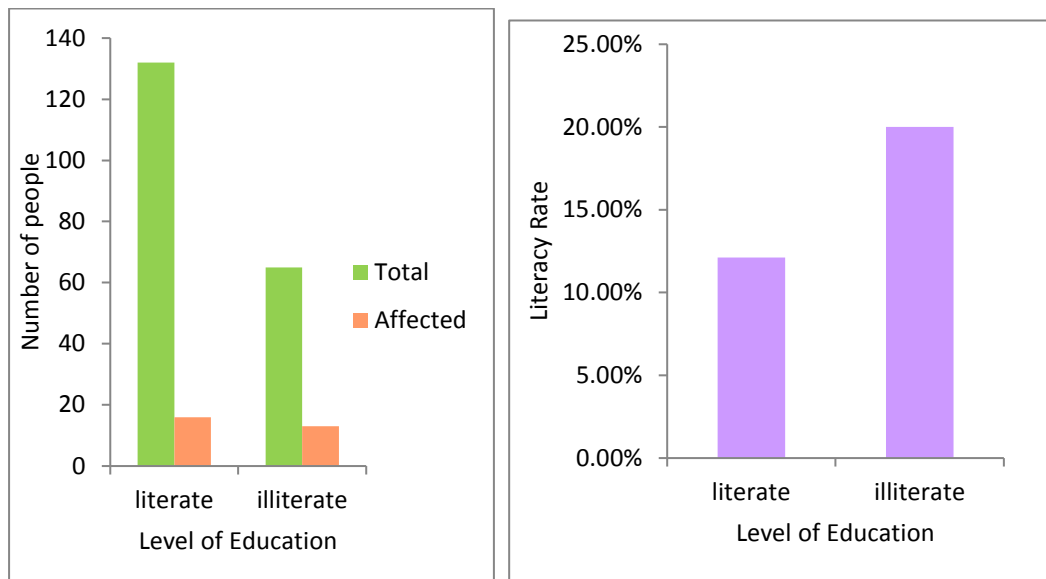
Mother's literacy is usually considered to be a dertermining factor in case of infant mortality. Accordingly, we had also taken mother's literacy to be an important variable in determining the reasons of infant mortality in Malda. In our sample most of the mother were literate. The number of literate mother was 135 to 196 nd the number of illeterate mother was only 70 out of 196. While doing our field trip we found that among the 28 affected families, mothers of 16 children were illiterate and rest of the 12 were literate. The percentage of Literate mother among the affected family is thus 12% while the percentage of illiterate mother ist 20%.

This analysis clearly shows that child death is more prominent in the households with illiterate mothers than the families where the mothers are literate. This is may be due to the fact that educated mothers are more concious about their health during pregnancy and can take better care of their children. Therefore we can conclude that mother's education has an inverse relationship with child death.

CHILD MARRAIGE AND ITS RELATION WITH INFANT MORTALITY
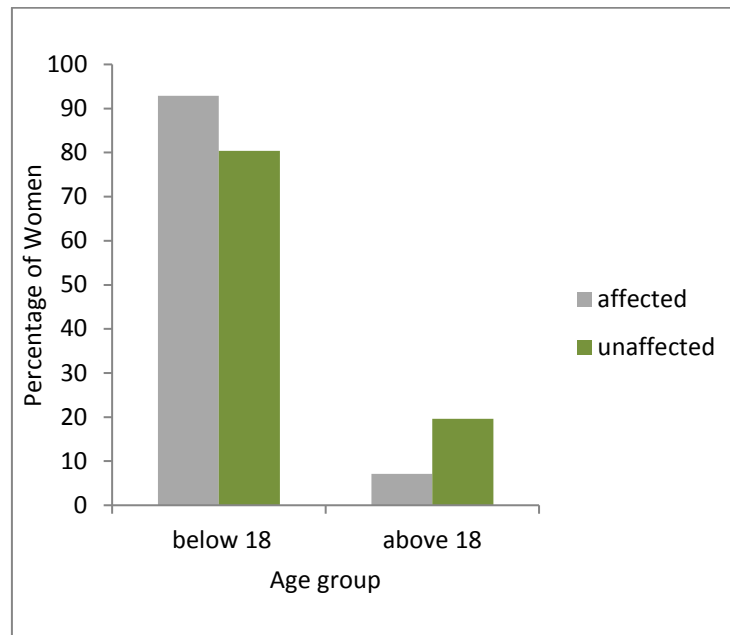
From our field experience of 20 days we could possibly conclude that child marriage is the most important reason responsible for child death in Malda. Most girls, here are married off, much before they turn 18. This can be illustrated by the graph above, which clearly shows that above 90% of the population from our affected group is the victim of the social curse called child marriage; whereas the proportion of child marriages among the unaffected group is comparatively less.

In fact our field trip was an eye opener as we got to know that most of the girls conceive their first child within their tender age of 14-16 years, when their body (suffering from under nourishment, anyway) is not really prepared to nurture a new life and is most likely to give birth to a very weak and feeble child, susceptible to various viral diseases which might often lead to fatal consequences. Therefore age of the marriage also has an inverse relationship with the child death, occurring in Malda.

PREGNANCY ASSISTANCE AND ITS EFFECT ON INFANT MORTALITY
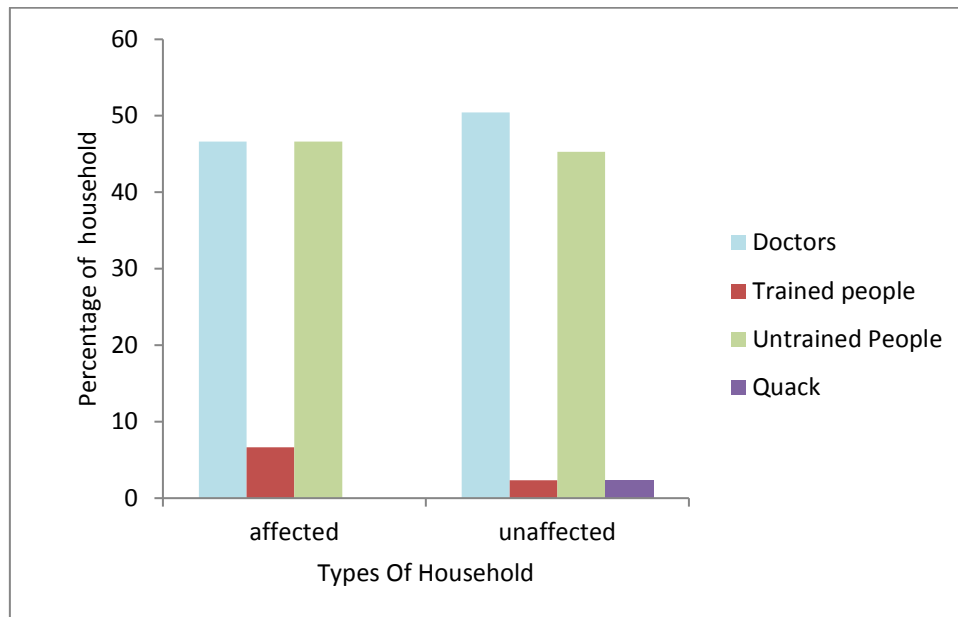
This particular diagrammatic representation shows the relation between the various kinds of child delivery assistance in affected and unaffected households.

Assistance of doctors during delivery is known to be the most desirable form, according to modern standards of health care system. What however is quite intriguing is the fact that 42.62% mothers of the affected families claimed the assistance of doctors at the time of their delivery. Besides, from this particular graph, we also get a glimpse of other forms of delivery assistance, for instance 6.67% of the mothers of affected families claimed that their delivery had been assisted by 'trained people', while 42.62% (the same number claiming doctor's assistance) said that they were helped by other (untrained) people at the time of their delivery. In contrast to this, assistance of doctors was claimed by 50.44% of the total numbers of unaffected families, studied; a percentage slightly higher than that in affected households, the assistance of untrained people being 45.29% and trained people and quack being 2.35% of the total population.

It is thus clearly visible from the bar diagram, that the percentage assistance of doctors in unaffected families is 4% higher than those in the unaffected ones. Besides, it can also be clearly identified that delivery in the hands of other untrained people is quite prevalent in all the households, affected as well as unaffected. Hence, we can conclude that contact with institutional health care service at the time of the mother's delivery does not

really affect an infant's probability of dying for in both affected and unaffected families the percentage of assistance by doctors on the one hand, and untrained people on the other remains quite high.

Infant mortality and Basic household amenities

Basic amenities are considered to be necessary for maintaining a standard living condition. The connotation of the word standard may vary from context to context. But in case of a village in rural West Bengal, the type of house, the kind of sanitation facility, the type of lighting and the kind of drinking water available, are the four basic kinds. These can give us an idea about the general living condition and hygienic position of the people of Malda. In fact the families' overall economic situation and access to the government facilities also get reflected under these indicators.

Initially we had expected that the basic amenities available in an affected household would be less than those available in the unaffected ones. However the graphical representations did not coincide with our a prior assumption. This might be due to the distinctive characteristics of our sample, (and might not hold true for the entire population)

Type of house
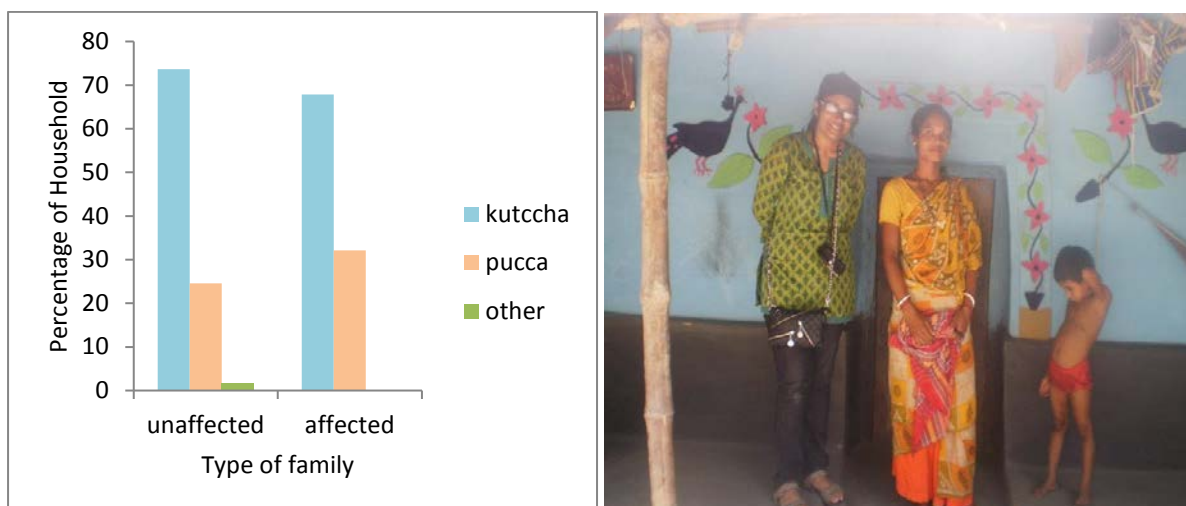
Mainly two types of households were surveyed-kuccha and pucca. In case of unaffected families where no deaths have taken place in the last five years, 73.65% were

found to live in kutccha houses whereas 67.85% of affected families (where at least one child death has occurred in last five years) were found living in kutccha houses. Such a result might be due to our the specific nature of our sample, having a high percentage of ST population (38.69% in the unaffected sample), who in spite of considerable economic upliftment prefers residing in traditional mud thatched kuchcha houses of their own..

Types of sanitation
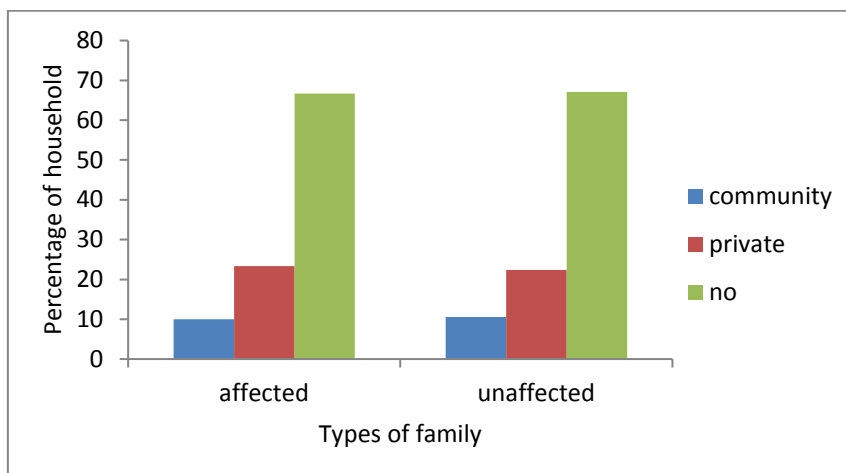
From the data collected by us, it was found out that almost an equal number of households among the affected and unaffected ones had no sanitation facility.66.67% affected families and 67.06% of unaffected families had no sanitation facility in their households. It was also found out that the percentage of families availing community sanitation facility is more or less the same for affected and unaffected household, the exact figure being 10% amongst affected families and 10.58% amongst unaffected ones. A similar kind of picture was portrayed even in the case of people having private sanitation facility; 23.33% in case of affected households and 22.35% in case of the unaffected ones. Such a situation might be because of an overall lack of sanitation facilities the entire region.

Types of lighting
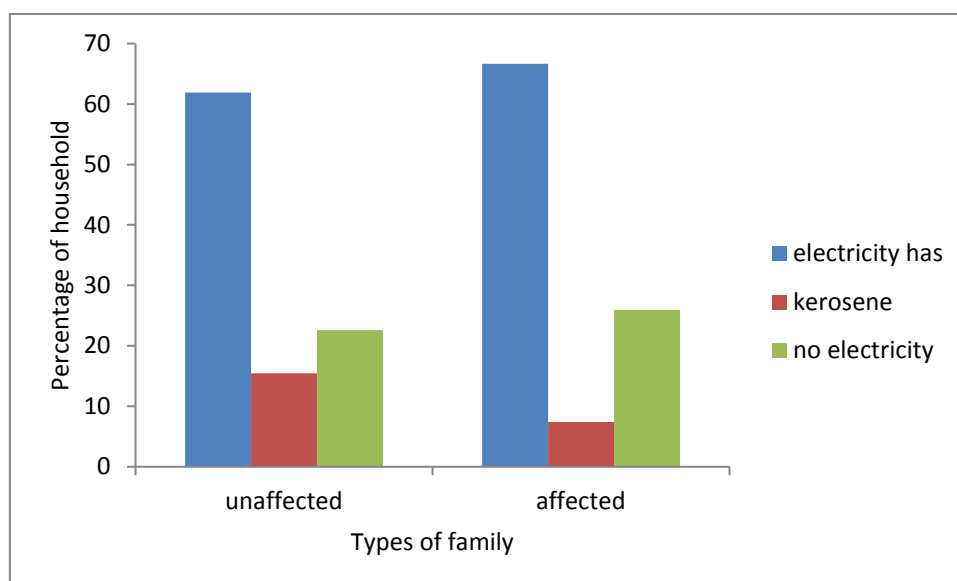
While comparing the numbers of families having electricity in the region, it was found out that 66.66% of the affected families availed electricity facilities in their household whereas 61.9% unaffected families availed the same. In case of affected families 25.92 % did not have electricity whereas 22.61% unaffected families had the same. If we combine the % of unaffected households using kerosene(a symbol of no electricity) with those already identified as 'no electricity' households, the total number of unaffected families having no electricity(38.08%) will exceed the number of affected families (33.32%). Such a strange distribution might be because of the fact that most affected households in the area fall in the BPL category, by the virtue of which, most get a free electricity connection from the government.

Types of sources drinking water
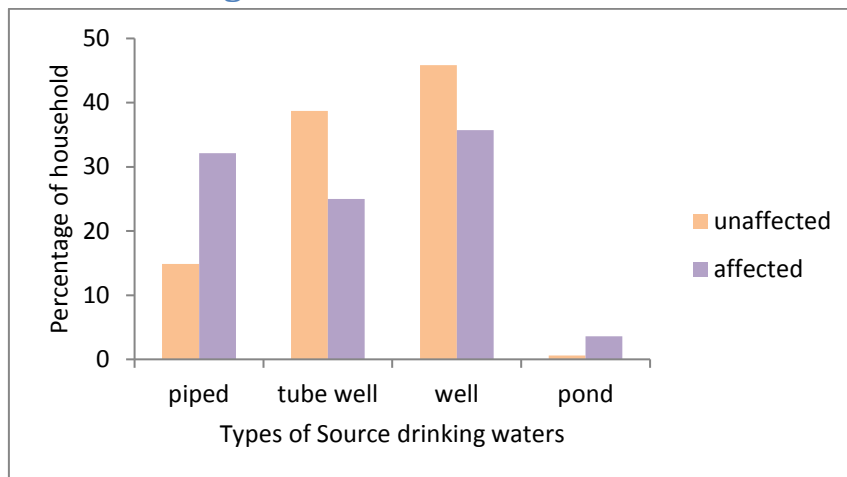
Another interesting fact, that came out from our analysis is the fact that, affected families (32.14%) are accessing piped water more than the unaffected ones (14.88%). Drinking water is an essential requirement for human life. The awareness for the need for safe drinking water has perhaps helped the affected families, who have recently started using piped drinking water in greater numbers.

Transportation facility and infant Mortality
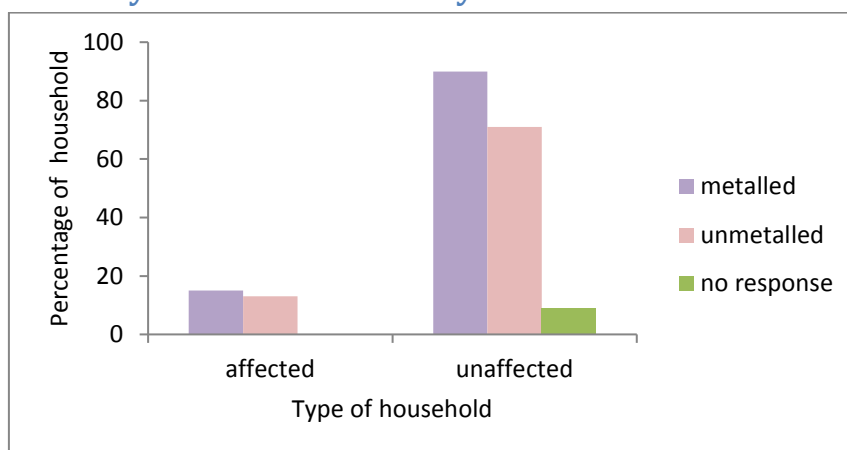
Easy access to medical care is indeed one of the reasons why infant mortality is lower in urban areas. In most rural areas however, the picture becomes gloomy, with high numbers

of un metalled roads leading to the government health centres. The situation gets even worse with weak government health infra structure. Government health outlets are very few and widely dispersed over the entire region. This has caused uneven service availability in different villages of Malda. These factors are indeed directly related with the mortality portfolio of the region.

 In Malda however we found that the roads leading to the local health centres were mostly metalled. The diagrammatic representation above shows that most affected households were connected with the nearest health centre through metalled roads and thus it can be easily deduced that type of road is not the real cause of inconvenience in reaching the health centres in this particular region. The real problem being, getting the families to the hospital, due to the lack of awareness. The bar graphs suggest that 53.57% of affected household's access metalled roads in order to go to the nearest health facility outlets while the rest (46.42%) access unmetalled road for the same. Again almost the same percentage of unaffected households, i.e.52.94% access metalled roads for visiting the nearby health centre, while the rest (41.76%) uses unmetalled road for the same.

CASE STUDIES: STORIES FROM THE AFFECTED HOUSEHOLDS

BLOCK- GAJOLE

Gazole, a block lying in the eastern part of the district is a home for nearly 4.5 lack people and has the district of south Dinajpur adjacent to it. Spread over an area of 513.73 sq km, It is predominantly a tribal populated block with 15 GPs and 293 villages in it. In these block, we had selected about 10 affected families from the 3 most affected GPs. Out of these, we present here the case study of the two most stimulating ones.

Sepali Yadav, **of Salbona village in Majra G.P** of Gajole, wakes up wearily from her afternoon nap,as her 8 year old *'soi's niece'*(friend's niece) excitedly rushes into her room to report, that "*shohorer didimonis*" (the didis from the city) have come to talk to her. Sceptically, she takes a peek from her room; then arranges her saree and brings out two plastic chairs for the guests. "*ke eyechhe*"(who has come), asks her mother in law irritated, as Sepali replies shortly "*kutumb*" (guest).

Sepali, a thin and feeble 'girl', clad in a green cotton saree, faded with years of shabbiness, gets a *piri*(a wooden seat) from her house as she arranges her seat and in front of us. *"Tomra sarkar thheke?"*("are you from the government"), is the first thing she asks. We look at each other and try our best to clear our position. She looks at us in exclamatory disbelief for she does not see any reason why her's would be a story which these didis would take an interest in, otherwise. She starts narrating her story, any way; taking short pauses here and there, trying to understand our response.

Sepali was married when she was 12 years old, and had her first child when she was 13. Her second child, a boy, was born when she was just 15, and died soon after; for his lips were not formed properly and hence he could not eat or suckle milk. Sepali is now 18, and in the last winter her third child died, when she was just 3 days old. During her first delivery, Sepali used to go to the ICDS "*khichuri*" centre, to avail her quota of khichdi and egg. She even tried having the iron tablets, but could not complete the full course as it tasted bad. "The ICDS didis scolded me for not taking the medicines regularly" and so she stopped going there any further. She does not seem to be devastated with the death of her children. "*Bhogobaan deyen o jemon, neyen o temon; dile thhik-e thhakbe. Borotaar belaye o to dakta dekhaye ni. Bhogobaaner ichha, tai roilo,abar bhogobaan jokhon deben..."*(Its God's will. He is the master and he will decide when I will get another child. I did not pay a visit to the doctor, even in the case of my first child, so why should I now. All is God's will..)..She explains.

Delnur Bibi of Kadamtuli village in Alal GP gives us a similar explanation. Delnur, presently 19 years of age was married when she was 17. She was a regular visitor to the "*khichuri centre*"(the ICDS centre popularly called so), during her pregnancy days, had taken around 40 Iron tabs(in a course of 120 tabs), and had taken all the vaccines available to her. In spite of living such a 'disciplined life', Delnur's very first child, born in the Hatimari hospital, had lived only for 3 months. The doctor in the hospital had warned Delnur, of the baby's low weight, right at the time of its birth and Delnur had taken all the precautions she could, accordingly. Yet, when her baby died, Delnur did not feel the urgency to visit the doctor for a second time for she knows it only too well that doctors are not super human beings and that only if Allah wants, they will have another healthy child.' "*Allah chaile abaar hobe*", she says firmly.

Discussing the situation with Mrs. Subhra Biswas, an ASHA worker in Salbona village, Subhra Di, helped us in understanding the situation. Didi, working in this area for the last couple of years told us, that in most of these families, the pregnant ladies, do not get a proper balanced meal to eat. They mostly survive on rice and '*shaak*'(leafy vegetables), hardly having any protein intake. "Why don't they have the egg that the ICDS centres provide for", we asked agitatedly. " *Nijera khabe?? Swami, bachchaa der na diye?*" (How can they have it, without giving it to their husbands and children), replied Subhra Di quite blatantly, a class 8 school dropout herself.

BLOCK- KALIACHAK-III

After finishing 3 days of exhausting yet enriching field study in Gazole, we started a fresh with Kaliachak-3. Kaliachak- 3 is a block lying to the east of the Murshidabad district and has the international borders of Bangladesh in its west. The block is predominantly dominated by the muslim community and most people earns a living here, by bidi binding. The block is spread across an area of 127.37 sq km. and has an estimated population of about 2,84,351. Being one of the most 'backward' blocks of malda (as quoted from the discussion with the BDO, Maldah- Mr. Suman Biswas), records suggest that this is indeed one of the blocks, from where the highest number of crib deaths have been identified last winter. Out of several cases, we however, managed to interview only about 10 affected households from the

three GPs that we had covered. Out of these, we present here the case study of the two most intriguing ones.

Tasneem Bibi had already heard that a group of girls have come to the locality, from her husband Asghaar Ali, a local farmer, owning about 2 bighas of land. We had met Asghaar Saheb (that is how, he is referred to in his **village of Bhadutola, GP- Bedrabad**), a man of about 45 (visual idea), right at the time when we had been to the local BDO's office, and thus it became very easy for us to identify his house.

His house, like we had expected, was a kuchha house, thatched with mud and was surrounded by a small piece of land, with litchi and mango trees. Like in most households, we had visited, Tasneem had already arranged for three plastic chairs in the '*daawa*'(courtyard). Asghaar Saheb led us in, as we made our way to our respective seats. Tasneem, with half of her head and face covered with the *pallu* of her saree, looked exceptionally frail and weak, as she remained standing nearby, in a corner. Asghaar Saheb took the hint and asked us, "*O-r toh shorir bhaalo na, apnaara amakei ja jiggesh korbaar, koruun*" (she is not well, so ask me whatever you want to). We looked a little puzzled, as we knew that this would not be a really good way to conduct the interview. We pointed to Tasneem, the third of the three chairs, which was empty, and asked her to sit. " will the other didis not come", she asked, her voice almost inaudible. " No", we told her, as the rest were busy trying to locate the unaffected households, nearby. Tasneem took her seat, as Asghar sahib looked on. We tried starting the conversation with Tasneem, only to find Asghaar sahib's presence extremely interfering. But we knew it only too well, that even Tasneem would not be comfortable without him around. So we continued, trying to extract Tasneem's original answers, as much as pwe could. Tasneem claimed her age to be 40, though she looked younger, and already had five children aged 23 , 21, 18, 15 and 14 respectively. The elder one, a girl, is already married and is a mother of two while her youngest sibling (a brother) helps their father in the field. Tasneem was married when she was 16 and had a series of still births after the birth of her youngest son. Her latest pregnancy ended in September 2011, when she gave birth to a girl child, who lived for only around 12 days. Tasneem was inflicted with T.B. during her pregnancy, and blames her ill health for the baby's death. The baby was born at home, with the help of her relative, just the same as was done in case of her other children. She does not feel any pressing need to consult a doctor, for

she 'feels alright now except for the occasional bouts of cough', and is scared that the doctor may forcefully 'operate' Asghaar Sahib (undergo a Vasectomy). We were shocked, and helpless. We could neither sound like moral preachers, asking them what 'should' and 'should not' be done; nor could we find any other way to make them understand, that Tasneem's health requires immediate medical attention. With moist eyes, we came out of Tasneem and Asghaar's house, their 15 year old daughter, awaiting a similar future perhaps, waving goodbye to us.

Rabeka Khatoon's household, however portrayed a different picture. Rabeka, a comparatively younger mother of 28, lives in **Mominpur village of sahabajpur GP**, with her mother in law, and two sister in laws , as the men of the households fetch for their living by working as labourers in some distant area of Haryana. Rabeka, is a mother of 4 and had a pair of twins the last winter, of which 1 died within 5 months, of jaundice. Rabeka, a class 9 drop out, is aware of the importance of medical checkups during pregnancy and had always maintained a regular contact with Golapgaunje hospital and the local ICDS centre, while she was about to conceive. Her babies (identical twin boys) were born in last December in the Golapgaunje hospital, and were quite healthy at birth. Slowly however, the younger of the two, started developing symptoms of jaundice, which she did inform the doctors. What however was quite interesting is the fact that these 'doctors' were not the same ones from the hospital. "*Kanu daaktaar*" (local quack), was the first doctor, whom Rabeka consulted during her son's sickness. But according to her dismay, he could not do much. Finding no other alternatives, she took her child, to the Malda district hospital (the sub centre refusing admission, saying it's already too late), where they admitted him, but within a few days, the baby died. Rabeka is very upset with the health infra structure of her area, as she complains, " *ora bachcha take niye nilo*"(they took my baby from me).

Saira Khatun, the PHND (public health nursing director) of the Block Health Centre at Bedrabad GP in Kaliachak-III, helped us summarise and clarify our thoughts. We met Mrs. Khatun, a day after our field work at Kalichak was over. A middle aged women herself of about 40, Mrs. Khatun showed us an official record, through which she seemed to illustrate how greatly her hospital has been working, for the past 2-3 years. Trying to explain the reason for an increased number of infant deaths last winter, she said, " *ebaar thhanda-o toh*

khuub porechhilo, aar ta chhara era thhik moto khaabaar khaye na, daktar dekhabe na.. daktarer naamey shob haaturey dekhaye, aar sesh obosthay haashpaatal nie ashe.. taah amra ki korbo, didi?"(This time it was freezing in the winters, and any way, these women will not have their food properly, does not consult doctors at time and will only bring their kids at the dead end, what can we do..) Though Saira's words sounded harsh, we could immediately see what Saira meant.. Rabeka's example still fresh in our memories.

BLOCK- HOBIBPUR

WE started with Hobibpur on a scorching summer afternoon of June 2012, after finishing off with all our works at the blocks of gajole and kaliachak-III. Hobibpur, our third and the final destination covers an area of 397.10sq km. A home to about 1,67,568 people, it is a tribal dominated block, most of them relying on agriculture for livelihood. Situated in almost the furthest corner of South East Maldah, it has the Bangladesh borders both to its east and south. Reports had suggested Hobibpur to be another critically affected block as we selected 10 affected households, for our interview, out of the three GPs we covered here. Amongst these, we present here the case study of the two most absorbing ones.

Shyamali Hansda, a tall, lean girl, probably in her late teens, clad in a black saree, torn near its edges, was our first respondent in **Hobibpur GP of Hobibpur block**. Her house, like all the others in the locality, was a mud thatched one, with electricity. "A BPL line", she said. A class 5 drop out, Shyamali lived with her husband and in laws in the village of Haldarpara, her husband being the local '*napit*' (barber). Shyamali was married last to last year, when she was 17; and had her first child soon after. Her pregnancy lasted for a complete period of 9 months as Shyamali would regularly go to the ICDS centre for pills and vaccines. Her mother in law however was not of a very positive opinion about Shyamali's medical checkups. *"Amra toh oshob korai ni... oshob na koriyou toh dibbi bachcha hoechhe, ekhon oshob abar ki?"*(We had never had such things at our times. We still had kids. What are then these new luxuries for?). Shyamali gave birth at home, as according to the wishes of the 'elders'. The umbilical chord of the mother and the baby could however not be properly operated by the family midwifes, with the home made blades, made of bamboo sticks(*Bansher Konchi*), and the baby died within a few hours", narrated Shyamali stoically. "Don't you now regret", we asked Shyamali's mother in law, sitting on an elevated area of her

'dawa'. She looks at us with crooked eyebrows,*"tomader ki? Tomra aamader khete daao na porte daao.. oshob sohurey bepar tomader kachhe rakhho, amader amader moto thhakte daao"* (What is your stake? Do you people provide us with food or clothes? Keep your city-lives in your cities. Let us live independently.)

The Anganwadi workers in the ICDS centre near Shyamali's home, however had a very different story to tell. According to them, Shyamali, like most other women in the area, was not really regular to the ICDS centres, even in her initial days of pregnancy. "Most come to take the eggs from the centre, which they later feed the children of their family, and throws off the iron tablets. They demand money for vaccinations(a government scheme allots Rs. 500 for each vaccine taken by a mother who is of the age of 18 or above), but when they are denied of it due to non attainment of the official age of marriage, they stop coming to the centres all together", said Ruposhi Soren, an young Aganwadi worker of about 22.

The incidence with '*Badoler Bou'* (Badol's wife) was however something, which none of us had ever imagined. "*Badoler Bou*". That is how she is known in her village of Perapur,(in Akhtoil Gp) and that is how she expected us to call her. A girl just of about 19, was married off when she was 6. Already a mother of 3, she was expecting another one in this October. Her 1st child was born when she was just 12 and had died within a few months, so did her second child. Her third child, is the one eldest now, and is aged somewhere between 5 and 6. Married off in a very young age, she had forgotten her original name given by her parents, ("*baap mayer dewa naam to bhullei gechhi*", she says). "Then what do your parents call you now", we asked intrigued, to which Badoler Bou smiled and replied "*ora to shob morei gechhe*" (they are all dead)...

Badol, a man of in his early 20s, and a sharecropper by occupation, perhaps felt the need to speak up at that point. " *Ekhaane orokom-e hoy*" ("Such things happen here")he shouted out loud from the other room, as if to second his wife's words. In the course of her 12 years of married life, Badoler Bou had never visited a doctor, other than a local quack in cases of common flu and diorhhea. "*Amader o-r thheke beshi laagena*" ("We do not need the doctor for any other reason"), she says. "Not even at times of pregnancy", we asked her, anxiously; to which she replied

"*amader ekhane baari r meye bou ra toh o shoob jaane*" ("we do not need to. Here, the women of the villages have a complete know how about all these stuffs").

Badoler Bou had her fourth son, in last December, which died without any treatment of pneumonia within 21 day.

Some findings:-

- There is no evidence that suggests that infant mortality is higher among Muslims as compared to non Muslims

- Same case with the scheduled tribe and non scheduled tribes also.

- Government health outlets are very few and widely dispersed over the area.

- Most of the children are vulnerable- there is no visible distinction between the affected and unaffected families

- Recognition of malda sadar hospital as medical college without proper infrastructure

- Geographical location of malda district which attracts huge no of people from neighboring districts and states and bangladesh.

Conclusion

Based on all the empirical and graphical analysis above the results can be summarized as follows:-

Firstly mothers' education level seems to have a strong positive impact on infant mortality. With increase in the educational level of the mother infant mortality reduces.

Secondly income of the household has a strong influence on infant mortality. We have observed from the analysis that income level of the affected households is significantly lower than that of the unaffected households.

Thirdly child marriage is another unique factor pertaining to Malda which acts as a decisive force in in enlightening infant mortality. Owing to the minor age of marriage, women conceive at a much lower age and the risk of infant death increases.

Fourthly religion which thought to be a determinant factor in Malda is not coming out as a strong factor maybe because of our distinctive sample characteristics. Likewise basic amenities for a healthy life like type of house, type of drinking water, type of sanitation and type of lighting in each household are not that significant in influencing child death in Malda. Even communication networks like type of roads which links each house with the nearest health centre are not playing any significant role.

There are some other essential factors for sudden increase in infant mortality in Malda. These didn't come up as the outcome of our sample analysis but we received such insights from the villagers and from the in depth interviews that the particular geographical location of Malda is one of the main reasons for the rapid surge in infant mortality. Unchecked Bangaldeshi Immigrants and incoming population overflow from Bihar and Jharkhand are another reason. Recently MaldaSadar Hospital has become a Medical College in North Bengal apart from the only other medical college -North Bengal Medical College in Siliguri. So for better treatment people come from numerous sources outside the state. But on the contrary the infrastructural facility in Malda Hospital is not improved significantly as it should be in a Medical College. So this gap is another main reason for sudden hike in infant mortality in Malda.

POLICY RECOMMENDATIONS

Overall progress of society and nations largely depends on declined trend of infant and child mortality. Social and economic factorssuch as age at the time of marriage, income level of households, mother's education level, access to Government health facilities, infrastructural facilities, availability of basic amenities are the momentous factors that exceedingly impact, infant mortality. Therefore, the following recommendations can be suggested based on our present study in Malda.

- In order to reduce infant mortality, governmental policy should give priority to health promotion and education among the public about the risk of early child bearing and early marriage. There should be organized frequent awareness camps in villages to ensure that people's ignorance regarding the negative impacts of child marriage is minimized.
- There should be strict laws preventing child marriages even in small villages of the district.
- Government health facilities should be made more accessible to the common people of the villages. Improvement of infrastructural facilities in the hospitals as well as the health centres is required.
- Availability of basic amenities like electricity, sanitation facilities, safe drinking water in villages should be an immediate cause of concern for policy makers. Improvement in these factors will help reduce infant mortality in Malda by a large extent.
- Female education opportunities should be enhanced which will reduce early marriages and empower women to make their own decisions and thus improve on their economic condition as well.
- The proper functioning of the NREGA and PDS facilities should be supervised in Malda
- There should be more allocation of powers at the grass root level. The sarpanch (panchayat head) and the Block Development Officers should be empowered to make decisions for the improvement of facilities in the districts and in efficient allocation of funds. This was suggested to as by the Block Development Officers of the three blocks we surveyed.

It may help planners and policy makers to take appropriate decision to reduce infant and child mortality not only of the study area but also of the country as a whole

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