

Determinants of child mortality among the Rabhas of Udalguri district, Assam

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Abstract: Among several parameters to understand the living standard of a country, child mortality is a vital sensitive indicator. The study of child mortality has long been largely neglected by research in developing nations of world including India. Present paper deals with the infant and child mortality among the Rabhas of Udalguri district, Assam, to find out the reasons of child death as well as factors related to it. Interview with structured schedule was the prime method of data collection, while observation method was also applied whenever necessary. The cause of death was ascertained using verbal autopsy procedure. Percentage distribution, chi-square and logistic regression model have been used to determine the factors affecting child mortality. The study reveals that infant and child mortality among the Rabhas are 71.94 and 69.42 per 1000 live birth respectively. The female infant and child mortality are higher than that of male. It is observed that out of 605 live births, 563 (93.06%) children are surviving while 42 (6.94%) are dead. The main cause of death among the infant, 1-4 years and 5-14 years children are low birth weight (30.00%), diarrhoea (44.44%) and fever (42.86%) respectively. In the present study factors like mother's age at marriage, birth order, Parent's education, institutional delivery and immunization have played very important role in reducing child mortality.

Key words: Child mortality, chi-square, infant mortality, logistic regression, verbal autopsy

INTRODUCTION:

Children are considered to be the most valuable assets of any nation. The children therefore are needed to be protected and looked after well by any country or nation with a vision of prosperity. Among several parameters to understand the living standard of a country, child mortality plays as a vital sensitive indicator. According to UNICEF (2010) in the state of the world's children report noted that 8.1 million children across the world who died in 2009 before their fifth birthday lived in developing countries and died from a disease or a combination of diseases that could easily have been prevented or treated. It also noted that, half of these deaths occurred in just five countries namely, India, Nigeria, the democratic republic of Congo, Pakistan and China; while India and Nigeria both accounting for one third of the total number of under five deaths worldwide.

Many biological and socio-cultural factors are responsible for high mortality rate of the children, especially of the infants. The economically advanced countries were able to reduce their death rate to less than ten per thousand largely by providing their people with adequate and wholesome food, pure drinking water, better hospital facilities, better sewage disposal and taking proper measures to control various diseases (Agarwala, 1988).

For infant and young children, the risk of dying is closely related to the environment where they live, if they are ill equipped to deal with

infection. Inadequate food and lack of elementary hygiene are the other factors. While the baby is in mother's womb, the health and the nutrition of the mother, her age, the number of children she already had, the interval between them and the care during pregnancy, etc. have profound influence on its survival. Inadequate care during delivery, incomplete or no immunization, inadequate or no breast feeding and improper supplement feeding practices further enhances the hazard to the child. Thus, the determinants of child survival vary according to various socio-economic, cultural, demographic and health care factors. In reference to the above background in the present paper an attempt has been made to see the main causes of child death and also find out the various factors associated with it.

DATA AND METHOD

For the present study, data have been collected from five randomly selected villages inhabited by Rabhas under Udalguri PHC, Udalguri district. Altogether 250 eligible couples, having 0-14 years aged children, were selected and the mothers were interviewed for collecting the data on child mortality. The children are grouped into three different age groups like infant (<1 year), pre school (1-5 year) and school going age (5-14 year). The age of the deceased children was ascertained by the date of birth. If the parents could not recall then it was ascertained by the religious and ritual events. The causes of deaths were ascertained by using standard verbal autopsy procedure. A verbal autopsy is a method of finding out the causes of a death based on interview with next of kin or other

care givers. In case of doubt, the cause of death was ascertained after discussion with the Medical officer of Udalguri PHC . Interview with structured schedule was the prime method of data collection. The interlinkages between child mortality and different variables have been tested by applying cross- tabulation analysis. The cross-tabulation analysis is important in first step for studying the relationship between mortality and several characteristics. The logistic regression model was used to estimate the odds-ratios for the different independent factors influencing child mortality. This analysis considered only those variables which were found significant in cross-tabulation analysis.

Variables:

Following variables are taking into consideration in the study. (i) **Bio-demographic** variables including mothers’ present age, mothers’ age at marriage and birth orders (ii) **Health care** variables including place of delivery, delivery

attendant, status of immunization, and Tetanus toxoid during pregnancy and (iii) **socio-economic** variables including mothers’ education, fathers’ education, and fathers’ occupation.

Data Analysis

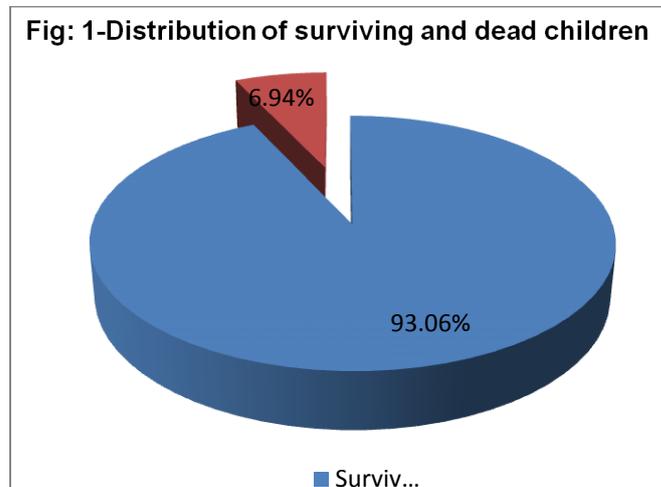


Table-1: Distribution of child mortality according to age

Categories	Live birth	Surviving children	No. of death			Mortality rate (per 1000 live birth)
			Male	Female	Total	
Below 1 year	139	129	4	6	10	71.94
1-5 year	139	121	8	10	18	129.49
5-14 year	327	313	8	6	14	42.81
Total (0-14 yrs)	605	563	20	22	42	69.42

Table-2: Distribution of dead children according to causes of death

Categories	Causes of Death	Male	Female	Total	Percentage
0-1 years	Aspexia	1	1	2	20.00
	Low birth weight	0	3	3	30.00
	Nojor loga	1	0	1	10.00
	Pneumonia	1	1	2	20.00
	Diarrhoea	1	1	2	20.00
	Sub total		4	6	10
1-4 years	Aspexia	0	1	1	5.56
	Diarrhoea	3	5	8	44.44
	Jaundice	1	1	2	11.11
	Respiratory problem	0	1	1	5.56
	Letha loga	3	1	4	22.22
	Fever	1	1	2	11.11
	Sub total		8	10	18
5-14 years	Animal bite	1	0	1	7.14
	diarrhoea	2	1	3	21.43
	dysentery	0	1	1	7.14
	fever	4	2	6	42.86
	joundice	1	2	3	21.43
	Sub total		8	6	14

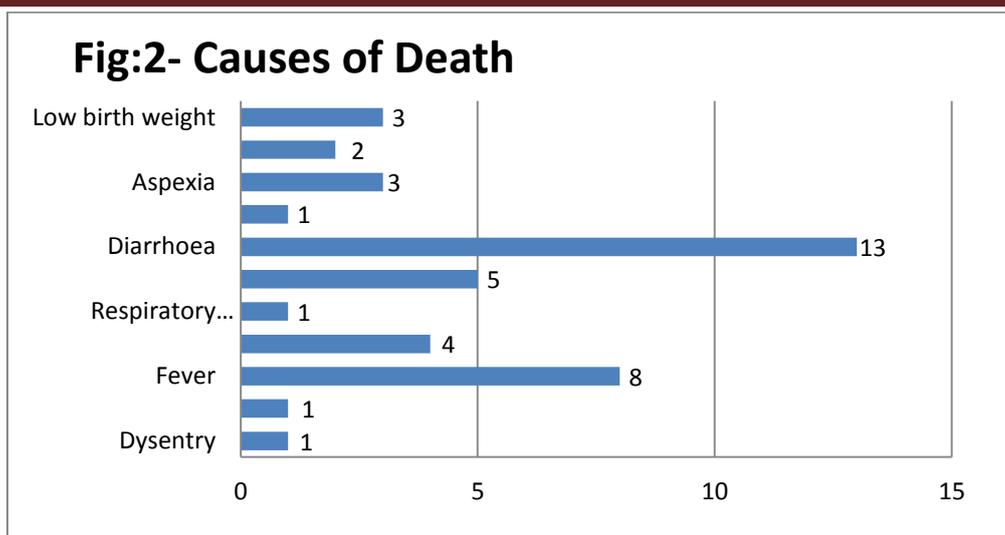


Table-3: Factor influencing child mortality, percentage and results of χ^2 tests

Sl. No	Factors	Child Survival			χ^2	p value
		Live birth	Alive	Death		
1.	Present age of mother				3.48	0.175612
	<25	67	59 (88.06)	8 (11.94)		
	26-35	345	321 (93.04)	24(6.96)		
	>36	192	182 (94.79)	10 (5.20)		
2.	Age at marriage				8.94	0.011450
	>19	218	196 (89.91)	22(10.09)		
	20-23	227	220 (96.92)	7 (3.08)		
	>24	159	146 (91.82)	13 (8.18)		
3.	Birth order				33.81	0.000001
	1	250	243 (97.20)	7 (2.80)		
	2—3	309	286 (92.56)	23 (7.44)		
	4+	45	33 (73.33)	12 (26.67)		
4.	Place of delivery				18.35	0.000019
	Hospital	454	434 (95.59)	20 (4.41)		
	Home	150	128 (85.33)	22 (14.67)		
5.	Attendant at the time of delivery				27.88	0.000001
	Doctor	450	433 (96.22)	17 (3.78)		
	Trained <i>dhai</i>	139	117 (84.17)	22(15.83)		
	Untrained <i>dhai</i>	15	12 (80.00)	3 (20.00)		
6.	Status of Immunization				31.52	0.000001
	Still Continuing	138	116 (84.06)	22(15.94)		
	Completely done	340	324 (95.29)	16 (4.71)		
	Half done	120	118 (98.33)	2 (1.67)		
	Not done	6	4 (66.67)	2 (33.33)		
7.	TT during pregnancy				19.22	0.000012
	Yes	477	455 (95.39)	22 (4.61)		
	No	127	107 (84.25)	20 (15.75)		
8.	Mothers' education				10.54	0.005143
	No education	328	296 (90.79)	32 (9.81)		
	Primary	142	134 (94.37)	8 (5.63)		
	Secondary and above	134	132 (98.51)	2(1.49)		

Sl. No	Factors	Child Survival			χ ²	p value
		Live birth	Alive	Death		
9.	Fathers' education					
	No education	194	180 (92.78)	14 (7.22)	5.16	0.076543
	Primary	193	174 (90.16)	19 (9.84)		
Secondary and above	217	208 (95.85)	9 (4.15)			
10	Fathers' occupation					
	Bussiness	109	102 (93.58)	7 (6.42)	1.86	0.761834
	Cultivator	272	256 (94.12)	16 (5.88)		
	Labour	176	160 (90.91)	16 (9.09)		
	Service	19	18 (94.74)	1 (5.26)		
Others	28	26 (92.86)	2 (7.14)			

P value <0.05 significant

Table-4: Logistic Regression Estimates for the effects of some selected variables on Child Mortality

Sl. no	Factors	Coefficient	S.E.	Sig.	Exp(B)	95% C.I.
1.	Age at marriage				1	
	>24 (Ref.)					
	>19	0.380	.368	.302	1.462	.711-3.005
	20-23	-1.029	.481	.032	.357	.139-.917
2.	Birth Order				1	
	1 (Ref)					
	2-3	1.027	.440	.020	2.792	1.178-6.618
	4+	2.536	.510	.000	12.623	4.641-34.333
3.	Place of delivery				1	
	Hospital(Ref)					
	Home	1.316	.325	.000	3.730	1.973-7.051
4.	Attendant at the time of delivery				1	
	Doctor(Ref)					
	Trained <i>dhai</i>	1.566	.339	.000	4.789	2.463-9.313
	Untrained <i>dhai</i>	1.851	.691	.007	6.368	1.643-24.681
5.	Status of immunization				1	
	Completed(Ref)					
	Still continuing	1.346	.346	.000	3.841	1.950-7.566
	Half Done	-1.069	.758	.158	.343	.078-1.515
	Not Done	2.315	.903	.010	10.125	1.725-59.445
6.	TT during pregnancy				1	
	Yes(Ref)					
	No	1.352	.327	.000	3.866	2.036-7.340
7.	Mothers' education				1	
	Secondary and above (Ref.)					
	Illiterate	1.965	.736	.008	7.135	1.685-30.212
	Primary	1.371	.800	.087	3.940	.821-18.902

Results and Discussion:

During the study period, out of 605 live birth 42 child death were reported (Fig.1). The mortality rates of infant, under five and 5-14 years age group are 71.94, 129.49, and 42.81 respectively per 1000 live birth. The total child mortality (0-14 yrs) rate is 69.42. If the percentage of infant

mortality is compared with percentage of infant mortality in India (4.70%), the present study shows quite a higher percentage. Again female child mortality is found to be higher than the males.

The major causes of death during infancy is low birth weight (30.00%) followed by aspxia (20.00%), pneumonia (20.00%), diarrhoea

(20.00%) and “Nojor loga” (evil eye) (10.00%). The major causes of death in the age group 1-5 yrs are diarrhoea (44.44%), followed by “Letha loga” (evil spirit) (22.22%), Jaundice (11.11%), fever (11.11%), aspxia (5.56%) and respiratory problem (5.56%). While fever (42.86%) is the main cause of death among the 5-14 yrs age group children followed by jaundice (21.43%), diarrhoea (21.43%) animal bite (7.14%) and dysentery (7.14%) (Table-2). In the present study, diarrhoea is found to be the killer disease among the children (Fig. 2). In overall scenario of Assam and India also diarrhoea is found to be the main killer disease of children (NFHS-3, 2007).

The distribution of child mortality by different variables is shown in table no. 3. From the table, it is observed that mothers' age at marriage, birth order, place of delivery, attendant at the time of delivery, status of immunization, immunization for tetanus during pregnancy and mothers' education are significantly associated with child mortality. While the chi-square test has shown no statistical significant association of child mortality with other variables viz. mothers' present age, fathers' education and fathers' occupation.

When child mortality is compared with mothers' present age, it is found to be the highest within the mothers of below 25 years of age (11.94%), followed by mothers of 26-35 years of age (6.96%) and mothers of above 36 years of age (5.20%). Age at marriage plays a very significant role in child mortality. Child mortality is found to be the highest i.e 10.09% among those mothers whose age at marriage is below 19 years while it is the lowest i.e 3.08% where mothers age at marriage is between 20-23 years. Similarly birth order also plays a very vital role in child mortality. Child mortality is found to be 2.80% in those mothers who had given single birth; while it is 7.44% to the mothers having 2-3 children. It is 26.67% for those mothers had given birth more than 4 children. Therefore, it can be said that child mortality is higher when the mothers have more conceptions. It is said that children born in institutions are likely to have lower risk of mortality as compared to those children born in home. In this study also child mortality is found to be the highest in home delivery (14.67%) compared to hospital delivery i.e 4.41%. Child mortality is found to be the highest when deliveries are conducted by untrained *dhai* (20.00%). It is found to be 15.83% when deliveries are attended by trained *dhai* and it is 3.78% when attended by doctor. Thus, it is clear that doctors assistance is necessary for safe child birth and safe motherhood. The immunization of children against six serious but preventable diseases viz. tuberculosis, diphtheria, pertusis, tetanus, poliomyetelis and measles is an important aspect of child health care system in India. According to National Family Health Survey report of 2005-06 only 43.5% children in India and 31.4% in Assam

are vaccinated against the six dreadful diseases. A strong significant relationship is found between child mortality and status of immunization. The child mortality is the highest i.e 33.33% for the children who are not at all immunized. The percentage of child mortality for half immunized, still continuing and completely immunized categories are 1.67%, 15.94% and 4.71% respectively. Immunization of pregnant women with tetanus toxoid (TT) during pregnancy is found as an important factor which influencing child mortality. Child mortality is found to be the highest i.e 15.75% among those children whose mothers have not immunized with TT during the period of pregnancy. Maternal education is another important factor which affecting the child mortality. Children of illiterate mothers have higher risk of dying during infancy compared to literate mothers, as a strong link is seen between female education and child survival (Alam, 2011; Bhattacharya, 1999). Same result is found to exist between mothers' education and child mortality among the Rabhas. Child mortality when studied in relation to mother's education it is found to be the highest i.e.9.81% for the illiterate mothers, followed by 5.63% for primary educated mothers and 1.49% for secondary and above educated mothers. It is clear that the child mortality rate decreases with the increase of mothers' education. When the child mortality is studied in relation to fathers' educational status, the primary educated fathers have experienced the highest incidence of child death and the percentage is 9.84%. However, no significant association is found between child death and father's education. Child mortality when studied in relation to fathers' occupation, the highest mortality is found among the labour category i.e 9.09% and the lowest is found among the service category i.e 5.26%. Present finding is in conformity with the study of Alam, 2011 who found child mortality to be highest among the labour categories.

The results of logistic regression analysis are shown in table 4 in which it is observed that all the explanatory variables have significant effect on child mortality. In the present study mothers' age at marriage play an important role on child mortality. The relative risk of child mortality is found 1.462 times higher for younger age group mothers (<19 years) and 0.357 times lower for mothers of 20-23 years as compared to 24 years and above age group mothers. Birth order shows a very strong relationship with child mortality risk. The risk of child mortality is 2.792 times higher for birth order 2-3 and 12.623 times higher for the birth order 4+ as compared with single birth order. It is often assumed that delivery in hospital is relatively safe for both mother as well as their children. The risk of child mortality is 3.730 times higher for those babies delivered at home as compared with those babies delivered at hospital, which is in agreement with the predetermined assumption. When child

mortality is compared with attendant at the time of delivery the risk is found 4.789 times and 6.368 times higher in case of train *dhai* and untrained *dhai* respectively as compared to delivery assisted by doctor. Status of immunization is another important factor which plays a very significant impact on child mortality. Child mortality is found 10.125 times higher among non immunized children when it is compared with immunized children. However, the risk is found to be 3.841 higher but .343 times lower for still continuing and half immunized children respectively. Tetanus Toxoid (TT) during pregnancy was also found to be a significant variable for child mortality. The risk of child mortality was found 3.866 times higher for the children whose mothers are not vaccinated for tetanus toxoid during the period of pregnancy as compared to the children whose mothers are immunized for TT during pregnancy. Mothers' education is another important factor which affect on child mortality. Child mortality is found to be 7.135 and 3.940 times higher for illiterate and primary educated mothers

respectively when it is compared with secondary and above educated mothers.

Conclusion:

The findings suggest that age at marriage and birth order are the most important bio-demographic predictor of child mortality. But, mothers' present age show no significant effect on child mortality. Further the results have shown that several health care variables show a very strong effect on child mortality. These are place of delivery, attendant at the time of delivery, status of immunization and immunization of mothers with TT during pregnancy. Among socio-economic factors only mothers' education show significant effect on child mortality. Therefore, from the findings following conclusion may be drawn:

1. To reduced child mortality educational facilities for women should be enhanced and
2. Improvement of the maternal and child health care facilities will decrease the child mortality rate.

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