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Factors Affecting on Child Health and Immunization under Five Year Children in Bangladesh

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Abstract: ***Immunization is the process whereby a person is made immune or resistant to an infectious disease. In recent years, Child health and Immunization is an important topic or problem for debate or discussion. Childhood immunization for child health very nearly gagedefense from many serious diseases. The present study aimed to assess the influential factors that affect health and immunization under five year's children in Bangladesh. We have attempted to estimate the relationship between associated variables by using the Pearson Chi-Square test. It also show that how important an individual variable is by itself. The study also employed a statistical technique namely, logistic regression analysis. Logistic regression analysis has been used to find out the effects of the selected demographic and socio-economic factor on health and immunization. Qualitative findings indicated that mothers reported benefits of immunizing children that appeared to be a major reason for their children's immunization. We observed that 86% mother's who are illiterate, they have highly unconscious about child health and 93% poorest have also unconscious about child health, also place of delivery and size of child at birth are more important significant factors for this topic. From the logistic regression analysis technique the variables Current age of children, Mother's education, Mother's occupation, Father's education, Wealth index, Place of delivery, Source of drinking water, Size of child at birth, No. of living children, and No. of household member are significant effect on child health and Immunization.***

Keywords: Health, Immunization, Knowledge, Under five children, significant factors

1. Introduction

Immunization is a proven tool for controlling and eliminating infectious diseases and is estimated to avert between 2 and 3 million deaths each year. Immunization is one of the most important strategies for the prevention of childhood sicknesses and disabilities and is thus abasic need for all children. Immunization of children against the major vaccine-preventable diseases (tuberculosis, diphtheria, pertussis, tetanus, hepatitis, haemophilus influenzae type B, poliomyelitis, pneumonia, and measles) is globally recognized as one of the most cost-effective programs to reduce infant and child morbidity and mortality. In developing country, Child sustainability is the most important habitats for world. The EPI is a priority program for the government of Bangladesh. It follows the international guidelines recommended by the World Health Organization (WHO). According to the Bangladesh immunization guidelines, children are considered fully immunized when they have received doses of the "standard eight"This are antigens—one dose of the vaccine against tuberculosis (BCG), three doses of pentavalent (DPT, Hib, and HepB), three doses of polio vaccine (excluding polio vaccine given at birth), and one dose of measles vaccine. One dose of BCG is given at birth or at first contact with health workers; the pentavalent and polio vaccines require three doses at approximately 6, 10, and 14 weeks; and the measles vaccine is given soon after 9 months. Parental decisions regarding immunization are very important to improve immunization rate. Parents' knowledge and practices regarding immunization are the major factors that contribute to their vaccination decisions.Against the present socio-economic conditions of Bangladesh, health and population sector performance in terms of immunization coverage of children under five, fertility decline, and increasing contraceptive prevalence rate (CPR) were, in fact, remarkable. Gabr (1985) identified the components of child health care services as follows: immunization services, growth monitoring, oral re-hydration therapy, promotion of breastfeeding, treatment of minor illness and outreach services. These activities are aimed at protecting child health and preventing ill health. Immunizations are given to protect the child against childhood killer diseases. The objective of child health care services according to Nelson (2000) is to reduce child morbidity and mortality to enhance mental, physical and psychological well being of the children to permit them to come to adulthood at their optimal stage of development as to complete with life struggle at their affective level.

Social factors like Mother's education, Mother's occupation, Father's education, Wealth index Source of drinking water and Demographic factors like Current of children, Place of delivery, Size of child at birth, No. of living children and No. of household member were found to have significant effect on child health and Immunization under five year's children in Bangladesh.

The main purpose is to improve parents' awareness, good knowledge regarding vaccination is required,to investigate the levels of illnesses of children under five years and toidentify socio-demographic factors associated with incomplete vaccination among children aged under five years in Bangladesh by using the data obtained from Bangladesh Demographic and health Survey(BDHS) 2014.

Data Source

In the estimation of factors for Child Health and Immunization in Bangladesh, we have mainly used the data extracted from the response of Children record questionnaire of 2014 Bangladesh Demographic and Health Survey (BDHS).The survey was conducted under the authority of the National Institute for Population Research and Training (NIPORT) of the Ministry of Health and Family Welfare. The survey was implemented by Mitra and Associates, a Bangladeshi Research firm located in Dhaka. Macro International Inc., a private research firm located in Calverton Maryland, USA, provided technical assistance to the survey as part of its international Demographic and Health Surveys Program. The U.S Agency for International Development (USAID)/Bangladesh provided financial assistance.

Analytical method

The bivariate and multivariate analysis both were applied in the study. The chi-square statistic (bivariate analysis) is commonly used for testing relationship between categorical variables which were related to child health and immunization and the multivariate analysis namely the logistic regression analysis was devoted to inquire net effects of covariates. Thestatistical analysis has been conducted using SPSS 21.

2. The Logistic Regression Model

The logit of the multiple logistic regression models is given by the equation

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \dots\dots\dots\dots\dots + \beta_i X_i$$

The dependent variable in logistic regressions is usually dichotomous, that is, the dependent variable can take the value 1 with a probability of success,or the value 0 with probability of failure 1- θ . The relationship between the predictor and response variable is not a linear function in logistic regression; here logit transformation of θ is given by:

$$\hat{\theta} = \frac{e^{(\alpha+\beta_1 X_1+\beta_2 X_2+\dots\dots\dots\dots+\beta_i X_i)}}{1+e^{(\alpha+\beta_1 X_1+\beta_2 X_2+\dots\dots\dots\dots+\beta_i X_i)}}$$

Where, α =the constant of the equation and β = the coefficient of the predictor variables

An alternative form of the logistic regression equation is:

$$Y = \text{logit}[\theta(X)] = \log\left[\frac{\theta(X)}{1-\theta(X)}\right]$$

$$= \alpha + \beta_1 X_1 + \beta_2 X_2 + \dots\dots\dots\dots\dots + \beta_i X_i$$

So, arguing analogously as in the case of linear regression model, we can say that $\beta_j (j = 1,2,3,\dots\dots\dots\dots,k)$ represents the rate of change in $\log\left[\frac{\theta(X)}{1-\theta(X)}\right]$ for one unites change inX_j $(other\ variable\ remaining\ constant)$.It has several properties; θ is bounded only 0 and 1. If $\theta(X)$ <0.5, logit θ is negative; while if $\theta > 0.5$ logit θ is positive.

3. Result and Discussion

Table 1 shows that the bivariate analysis of effective different independent variables.

Table 1: Bivariate effect on Immunization into different independent variables:

Variable	Category	Immunization		P-value
		No	Yes	
Current age of child	<2	31.17%(269)	68.83%(592)	.000
	2 to <5	6.19%(119)	93.55%(1797)	
Mother's education	No education	38.15%(169)	61.85%(274)	.001
	Primary	17.25%(136)	82.75%(667)	
	Secondary and higher	12.19%(183)	87.81%(1535)	
Mother's occupation	Primary level worker/ housewife	39.4%(298)	60.6%(457)	.030
	Secondary level worker	30.0%(13)	70%(49)	
	High level worker	26.2%(323)	73.8%(537)	
Father's education	No education	15%(108)	85%(613)	.007
	Primary	16.8%(145)	83.2%(716)	
	Secondary	12.0%(97)	88%(712)	
	Higher	11.5%(45)	88.5%(348)	
Wealth index	Poorest	29.38%(164)	70.32(391)	.045
	Poorer	26.07%(2080)	73.47%(587)	
	Middle	29.44%(195)	70.56%(472)	
	Richer	14.77%(70)	85.23%(404)	
	Richest	17.83%(51)	82.17%(235)	
Place of delivery	Home	38.1%(388)	61.9%(480)	.040
	Public hospital	40%(25)	60%(75)	
	District hospital	33.8%(21)	66.2%(41)	
	Child welfare center	14%(7)	86%(36)	
	Upazila health	16%(6)	84%(33)	
	Private hospital	20%(10)	80%(39)	
	NGO static clinic	7%(20)	93%(317)	
Source of drinking water	Piped water	6.46%(2)	93.54%(29)	.000
	Tube well water	13.87%(344)	86.13%(2173)	
	Surface	16.48%(15)	83.52%(91)	
	Others	42.45%(58)	57.55%(80)	
No. of living children	1 to5	14.9%(365)	85.1%(2302)	.030
	6 to 10	53.12%(28)	46.88%(57)	
No. of household member	1-3	89.3%(1929)	10.7%(230)	.009
	4-6	89.8%(3931)	10.2%(448)	
	7-10	90.8%(1041)	9.2%(106)	
	11-25	91.4(127)	8.6%(12)	

4. Results of Logistic Regression Analysis

Result of logistic regression analysis shown in Table 2. The variables Mother's education, Mother's occupation, Wealth index, Place of delivery, Source of drinking water, Size of child at birth, No. of living children, and No. of household member are 5% level of significance, the variables Current age of children,Father's educationare 10% level of significance. The 7th column of the table shown that the odds ratiowhich explain thatthe odds ratio of Current age of children is 5.663 indicates that Child health and immunization will be 5.663 times higher for those children's whose current age <5 rather than 1 to <2 . The odds ratio of mother's education is 1.248, 1.089, and 1.212indicates that Child health and immunization will be 1.248, 1.089 and 1.212 times higher for those mothers of children who have illiterate, primary and secondary than those mothers who have higher educated. Also the odds ratio of mother's occupation is 1.285 and .687indicates that Child health and immunization will be 1.285 and .687 times

higher for those mothers whose occupation secondary level worker and high level worker than those mothers occupation are primary level worker.The odds ratio of Fathers education are .888, 1.035 and 1.253indicates that Child health and immunization will be 1.888, 1.035 and 1.253 times higher for those fathers of children who have primary, secondary and higher educated than those fathers are illiterate. Similarlythe odds ratios of wealth index of respondents are 1.011, .934, .838 and .680 indicates that child health and immunization are 1.011, .934, .838 and .680 times higher for those respondents who have wealth index are poorer , middle, richer and richest than those respondents who have poorest.The odds ratios of place of delivery are .729, 1.575, .857, .615, 1.530, 1.311 and 1.044 indicates thatchild health and immunizationare .729, 1.575, .857, .615, 1.530, 1.311 and 1.044 times higher for those respondents whose place of delivery were Public hospital, District hospital ,Upazila health complex , Privet hospital ,Child welfare center and NGO static clinic than those at home. Also the odds ratio of source of drinking water is 1.123, 1.844 and 1.163 indicates that children perfect health are 1.123, 1.844 and 1.163 times higher for those children whose source of drinking water have Tube well, Surface water and others than those Piped water. The odds ratio of Size of child at birth is .878, 1.077, .996 and.1.074indicates that children perfect health is .878, 1.077, .996 and 1.074 times higher for those children whose size at birth have large, average small and very small than those children whose size very large. Also the odds ratios of No. of living children are .625 that child healthand immunization is .625 times higher for those respondent whose no. of living children have 6-10 than those no. of living children 1-5. And the odds ratios of No. of household member 1.265, 1.471 and 1.489 indicate that child health and immunization is 1.265, 1.471 and 1.489 times higher for those children whose No. of household member have 4-6, 7-10 and 11-25 than those no. of household member 1-3.

Table 2: Results of the multivariate logistic regression analysis showing the odds ratio, regression coefficients, and their significant level by socioeconomic and demographic characteristics which were effect on child health and immunization.

Variable	β	S.E	Wald	df	Sig.	Odds Ratio (OR)	95% C.I for EXP(B)	
							Lower	Upper
Current age of children <2(ref)								
2to<5	1.743	.118	217.693	1	.090	5.663*	4.498	7.129
Mother's education Higher(ref)								
Illiterate	.222	.230	6.083	1	.014	1.248**	.795	1.958
Primary	.083	.244	2.722	1	.008	1.089**	.648	1.828
Secondary	.193	.195	.978	1	.008	1.212**	.828	1.775
Mother's occupation Primary level worker/ housewife(ref)								
Secondary level worker	.251	.118	4.554	1	.033	1.285**	1.021	1.619
High level worker	-.376	.399	.889	1	.000	.687**	.314	1.500
Father's education Illiterate(ref)								
Primary	-.119	.118	1.013	1	.015	.888*	.704	1.119
Secondary	.034	.110	.094	1	.054	1.035*	.833	1.285
Higher	.225	.112	4.026	1	.070	1.253*	1.005	1.561
Wealth index Poorest(ref)								
Poorer	.011	.102	.012	1	.001	1.011**	.828	1.234
Middle	-.068	.114	.362	1	.028	.934**	.748	1.167
Richer	-.177	.137	1.656	1	.041	.838**	.640	1.097
Richest	-.385	.175	6.854	1	.028	.680**	.483	.958
Place of delivery Home(ref)								
Public hospital	-.316	.339	.870	1	.000	.729**	.375	1.417
District hospital	.454	.204	4.950	1	.000	1.575**	1.056	2.349
Child welfare center	-.154	.433	.126	1	.000	.857**	.367	2.002
Upazila health	-.487	.363	1.792	1	.000	.615**	.301	1.253
Community clinic	.425	1.170	.132	1	000	1.530**	.154	15.168
Private hospital	.271	.141	3.690	1	.000	1.311**	.995	1.729
NGO static clinic	.043	.345	.015	1	.000	1.044**	.531	2.053
Source of drinking water Piped water(ref)								
Tube well	.116	.398	.084	1	.000	1.123**	.514	2.450
Surface water	.612	.865	.501	1	.000	1.844**	.339	10.044
Other's	.151	.449	.113	1	.000	1.163**	.483	2.804
Size of child at birth Very large(ref)								
Large	-.130	.368	.124	1	.000	.878**	.426	1.808
Average	.074	.338	.048	1	.000	1.077**	.555	2.089

Small	-.004	.360	.000	1	.000	.996**	.492	2.016
Very small	.072	.382	.035	1	.000	1.074**	.508	2.271
No. of living children 1-5(ref) 6-10	-.471	.279	2.841	1	.000	.625**	.361	1.080
No. of household member 1-3(ref)								
4-6	.235	.109	4.624	1	.032	1.265**	1.021	1.566
7-10	.386	.128	9.082	1	.003	1.471**	1.144	1.891
11-25	.398	.237	2.813	1	.004	1.489**	.935	2.371

Note: ref=Reference category
**5% level of significance, *10% level of significance

5. Conclusion and Policy Implication

Taking experiences of safe motherhood initiatives in low resource setting into account, upgrading the quality and coverage of safe motherhood services (including neonatal care) will have the largest payoff in averting deaths and reducing disability among women and children in rural Bangladesh (Tinker et al. 1993). Recently, efforts to reduce maternal mortality in Bangladesh have been made using low cost easily deliverable technology such as tetanus taxied coverage of pregnant women, training of birth attendants and development of community mid-wives, coupled with awareness raising BCC campaigns for identifying and managing risky pregnancy.

The results from both bivariate and multi- variate analysis confirmed the importance of mother's education on the utilization of health care services. Female education retains a net effect on maternal health service use, inde- pendent of other background characteristics, household's socioeconomic status and access to health care services. The strong influence of mother's education on the use of health care services is consistent with the findings from other studies (Abbas and Walkerns, 1986; Elo, 1992; Becker et al., 1993; Fosu, 1994). Also, women's whose husbands are involved in business/services are more likely to use both modern and traditional health care services.

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