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Socio-Economic Determinants of Low Birth Weight in Kenya: An Application of Logistic Regression Model

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Abstract: Babies born with Low-birth weight are at increased risk for serious health problems which are accompanied by disabilities and even death. The purpose of this study was to determine socio-economic factors that lead to low birth weight of children in Kenya. Data used was from Kdhs 2003 and the significant effect of socio-economic determinants on low birth weight was examined using logistic regression analysis data is categorical and continuous in nature, where predictor variables being socio-economic determinants and birth weight being dependent variable. Results indicate that out of six socio-economic factors involved in the study, four (Religion, Time Wanted Pregnancy, Marital Status and Economic Status) revealed some significant effects on the children with low birth weight. Therefore Socio-economic determinants have a significant effect on Low birth weight which suggests a strong negative associated with infant survival in Kenya independent of other risk factors. The logistic function revealed a statistically significant association between the birth weight, Religion, Time Wanted Pregnancy, Marital Status and Economic Status. Predicted probability is 11.4% low birth weight. Researcher recommends that respondents should avoid conceiving unexpectedly since it was associated with high low birth weight. Also to effectively enhance normal birth weight in Kenya, then expectant mothers should keenly focus on the socio-economic determinants by avoiding marital problems like divorce.

Keywords: Socio-Economics, Birth Weight, Predictor Variables, Logistic Regression Model

1. Introduction

1.1. Back Ground of Study

More than 20 million infants worldwide, representing 15.5 per cent of all births are born with low birth weight, 95.6 per cent of them in developing countries (UNICEF, 2004). The level of low birth weight in developing countries (16.5 per cent) is more than double the level in developed regions (7 per cent) (UNICEF, 2004). Birth weight is a strong indicator not only of a birth mother's health and nutritional status but also a newborn's chances for survival, growth, long-term health and psychosocial development (UNICEF, 2008). A low birth weight (less than 2,500 grams) raises grave health risks for children (UNICEF, 2008). Babies who are undernourished in the womb face a greatly increased risk of dying during their early months and years (UNICEF, 2008). This is based on epidemiological observations that infants weighing less than 2,500 g are approximately 20 times more likely to die than heavier babies.

More common in developing than developed countries, a birth weight below 2,500 g contributes to a range of poor health outcomes. Those who survive have impaired immune function and increased risk of disease; they are likely to remain undernourished, with reduced muscle strength, throughout their lives, and to suffer a higher incidence of diabetes and heart disease (UNICEF, 2008). Children born underweight also tend to have cognitive disabilities and a lower IQ, affecting their performance in school and their job opportunities as adults. Previous studies have also linked infant mortality with mother's education, age at childbirth, delivery status, health status, parity and marital union; father's education and employment; household income and consumer goods, household safe source of drinking water and sanitation; and slum and rural residence (Sram etal,2005).

Demographic characteristics such as child's sex, ethnicity, preceding and succeeding birth interval, and birth order are also known to be associated with infant mortality (Luther NY etal, 1999). However, little research has been done in developing countries to examine the association of low birth weight and infant mortality. Using data from the 2003

Nigeria Demographic and Health Survey, this study examines if infants born with low birth weight have disproportionately higher risk of mortality than infants born with normal weight. In Kenya, both growth rate and LBW rate are quite high (4.96, 10%). Neonatal survival depends on both gestational maturity and birth weight and is not significantly better in babies who are LBW for gestational age (McCormick, 1985). Mortality rates of low birth weight babies have been shown to be very high in several studies (Barton, 1999). Findings of a community-based longitudinal study conducted in rural villages in Kenya during 1993-1994 revealed that 73% of the 34 infants who died before 12 months of age were the low birth weight. During the fetal phase, growth depends on the nutritional condition of the mother, indicating that pregnant women should not only increase their weight but also consume essential nutrients (Valsmakis G. et al, 1996). For many women in the developing world, however, socio-economic factors make it difficult for them to obtain the necessary food and health care, which are closely interrelated (Kramer MS, 1998).

Some researchers consider that health, therefore, may be an important determinant of opportunities in life and this process termed 'selection by health', and suggest that health 'selects' people in different social strata (UNICEF, 2004). The socio-economic factors are social economic class, education, household head, and age of the mother, smoking, antenatal visit, prenatal visits and time wanted (Lancet, 1993). In Kenya, the factors which are considered to affect birth weight are both biological and service related. Among these factors include maternal under nutrition, teenage pregnancy, poor antenatal care and nutrition education which may play crucial roles in causing small size births, Were (1998).

1.2. Statement of the Problem

More than 20 million infants worldwide, representing 15.5 per cent of all births are born with low birth weight, 95.6 per cent of them in developing countries (WHO/UNICEF, 2004).This contributes to high infant mortality rates and babies born are exposed to higher probabilities of infection, malnutrition and handicapped conditions during childhood (including cerebral palsy), mental deficiencies and problems related to behavior and learning during childhood (Kramer MS, 1998). Children who survive in this condition have a higher incidence of diseases, retardation in cognitive development and undernourishment. There is also evidence that small size births or its determinant factors are associated with a predisposition to higher rates of diabetes, cardiac diseases and other future chronic health problems (Olalekan, 2008). In Kenya, though health situation has improved substantially over the years, the low birth weight (LBW) is still high about 15 % (Were, 1987). Studies addressing factors associated with adverse birth outcomes have almost exclusively been based on hospital statistics (Were, 1987). This is a serious limitation in developing countries where the majority of births do not occur within health facilities (UNICEF, 2001). Hence the principal focus of this study was to ascertain the significant socio-economic determinants of low birth weight in Kenya based on the 2003 Kenya Demographic and Health Survey data.

1.3. Purpose of Study

The purpose of study was to determine socio-economic factors that lead to low birth weight of children in Kenya. The study was guided by the following specific objectives;

- To determine the contribution of socio-economic determinants associated to low birth weight.
- To derive the model that can predict birth weight of a child.

2. Literature Review

The prevalence of low birth weight has increased and later development of low birth weight children is still not very well known, however some longitudinal studies of low birth weight agree though that, after controlling social and economic factors, low birth weight has an independent negative effect on child health outcomes and this effect worsens as birth weight decreases, Boardman eta l (2002). Avchen etal (2001) stated that "while mortality rates declined for low birth weight infants, the consequences of survival for these children may be associated with adverse developmental outcomes" (p. 895). And indeed a number of studies have established links between low birth weight and (1) problems pertaining to school performance, psychomotor development and emotional well-being, and conduct disorders in children and adolescents (Cheung, 2002); (2) problems in pulmonary function, physical growth, neurological outcome, psycho-social development and social disadvantages (Gissler et al, 1999); and (3) respiratory problems, cognitive, neurological and psychological deficits (Kelly et al, 2001). So far, the role of the socio-economic in shaping low birth weight children's health outcomes had not been studied sufficiently, or incorrectly. Andersson et al (1997) have noted that "the relationship between cognitive development and social conditions among infants had been sparsely studied" (p. 83).

On the other hand (Saigal et al 2003) have noted that "socio-economic factors, racial and ethnic differences, the nature of funding of health care may further contribute to differences in the reported outcomes" (p. 943) but that quite often these are not sufficiently controlled for. Finally Kelly et al (2001) found that one of the reasons for the existing inconsistencies between different studies on low birth weight was "not considering the impact of the social economic factors". In most developing countries, low birth rate and babies born with small sizes has been a subject of interest to academic, researchers, and policy makers for a long time. According to Population Reference Bureau, World Data Sheet (2002) gives the population of Kenya as 29.8 million, a crude birth rate of 34 per 1000 population and a crude death rate of 14 per 1000 population. The annual estimated number infant mortality rate is 54.7% and the small size births contributes significantly and puts this situation and high rate of infant mortality in the country. Birth weight is the most important determinant of prenatal, neonatal and postneonatal outcomes McCormick (1985) and this has a direct relationship with the size of the baby born in most cases. From a research carried out in Bangladesh, socio-economic factors is one of the major determinant of low birth weight which then is a major predictor of infant death (Gazi etal, 2001).

The conventional theory of consumer behaviour as outlined by (Becker 1960, 1981) and Becker and Lewis (1973) contends that couples behave in a rational way when they decide on their number of children and they view children more or less as consumption goods. They argue that there is a negative relationship between birth weight and income which is one of the social-economic factors of small size birth of babies. A similar research has also been done affiliated with Moi University in department of Behavioural science where Discriminant analysis was used to identify predictors of low birth weight. The analysis was based on 123 cases who had complete data on all the variables used in the equation. Of those included in the analysis, 14 women (11%) delivered low birth weight babies and 109 had normal birth weight babies. Results of the discriminant analysis showed that mid upper arm circumference, body mass index (BMI), Blood haemoglobin levels (HB) and socioeconomic status (SES), are the best predictors of low birth weight. Ranked in order of relative contribution to birth weight they are BMI, HB, MUAC and SES. Low birth weight prevalence was determined as being 11.2 per cent. Eighty per cent of all known cases were correctly classified using the four variables.

As a screening tool for low birth weight this model with four variables has 93% sensitivity, 78.4% specificity, 35.13% positive predictive value and 98.98% negative predictive value (Were etal, 1998). The results suggest that it is possible to identify women at high risk for delivering low birth weight babies at the community level. The purpose of this study is to examine the relationship of socio-economic determinants of small size births and major effects caused by each determinant in Kenya. In the present study, logistic regression has been adapted as a data-driven method to study the variation among socio-economic factors and their effects to low birth weight in Kenya.

The logistic function was invented in the 19th century for the description of the growth of populations and the course of autocatalytic chemical reactions, or chain reactions, Cramer J.S., (2003). It allows researchers using qualitative measures of effectiveness, such as 'Low versus high,' to investigate relationships between that measure and many other measures simultaneously, whether those other measures are qualitative or quantitative Jonathan Walker, (1996). It is used for prediction of the probability of occurrence of an event by fitting data to a logit function logistic curve (Alan, 2002). Since this study has binary (low or normal birth weight) outcome, then logistic regression is the best model to be used in analysis Kvamme, (1988).

3. Methodology

3.1. Research Design

Sample for the 2003 KDHS covered the population residing in households in the country. Representative probability sample of almost 10,000 households was selected for the KDHS sample. Sample was constructed to allow for separate estimates for key indicators for each of the eight regions (Formerly provinces) in Kenya, as well as for urban and rural areas. Given the difficulties in traveling and interviewing in the sparsely populated and largely nomadic areas in the North Eastern region, a smaller number of households were selected in this region. As a result of these differing sample proportions, the KDHS sample is not self-weighting at the national level. Survey utilized a two-stage sample design. The first stage involved selecting sample points or clusters from a national master sample maintained by Kenya National Bureau of statistics (the fourth National Sample Survey and Evaluation Programme or NASSEP IV). The list of enumeration areas (EAs) covered in the 1999 Population Census constituted the frame for the NASSEP IV sample selection, and thus for the KDHS sample as well. A total of 400 clusters comprising 129 urban and 271 rural were selected in the master frame. The second stage of selection involved the systematic sampling of households from a list of all households that had been prepared in 2002. The household listing was updated in May-June 2003 in 50 selected clusters in the largest cities due to the high changes in structures and household occupancy in the urban areas.

3.2. Statistical Methods

The data was obtained from a sample of 2008 KDHS and it had covered the population residing in households in the country. Representative probability sample of almost 10,000 households was selected for the KDHS sample. Socioeconomic data contained both Continuous and categorical variables hence logistic regression analysis was found to be a suitable method for analyzing the data since it can handle both categorical, and continuous variables and the predictors do not have to be normally distributed, linearly related, or of equal variance within each group (Tabachnick and fidell 1996)

3.2.1. Logistic Regression Model

Logistic regression is a technique for making predictions when the dependent variable is a dichotomy, and the independent variables are continuous and/or discrete (Hosmer, D. W. & Lemeshow, S. 1989). It assumes that the relationship between the independent variable(s) and the dependent variable is logarithmic. It allows one to predict a discrete outcome such as group membership from a set of variables that may be continuous, discrete, dichotomous, or a mix. It is intended to predict probabilities, but these are between 0 and 1. Values between 0 and 1 would be difficult to predict by a linear combination of predictors, because the range usually is not limited for the DV. It is also more flexible than Discriminant analysis or regular regression analysis, since unlike Discriminant analysis, logistic regression does not assume continuous, normally distributed predictors and regression analysis, logistic regression does not run into the problem of predicting negative probabilities for group membership. Since the DV in the study are group in low and normal birth weight, and the independent variables contains categorical and continuous data, then logistic regression is the best method to predict the effects of the socioeconomic determinants in both cases of birth weight in Kenya. It's also known as the logit model. It computes the probability of the selected response as a function of the values of the predictor variables. If a predictor variable is categorical variable with two values, then one of the values is assigned the value 1 and the other is assigned the value 0. In this study (Normal Birth Weight) NBW is assigned a value of 1 and (Low Birth Weight) LBW a value of 0.

In logistic regression, the dependent variable is a logit, which is the natural log of the odds.

For a single exposure variable E, the model takes the form

$$In\frac{p}{1-p} = a + bx \tag{1}$$

Where p denotes the probability of occurrence of the outcome D and x is the value of an exposure E. The equation can be inverted to give an expression for the probability of p as,

$$P(D) = \frac{1}{1+\exp(-a-bx)} \tag{2}$$

The risk of the outcome given the exposure will thus be obtained by putting x=1 in the equation (2), we obtain

$$P\left(\frac{D}{E}\right) = \frac{1}{1+\exp(-a-b)} \tag{3}$$

while the risk of the outcome given no exposure (x=0) we obtain

$$P\left(\frac{D}{E}\right) = \frac{1}{1+\exp(-a)} \tag{4}$$

The relative risk is the ratio of these two expressions. We will use the odds and odds ratio.

The odds of the outcome given exposure are, from equation (3),

$$\frac{P(\frac{D}{E})}{P(\frac{D}{E})} = \frac{P(\frac{D}{E})}{1-P(\frac{D}{E})} = \frac{\frac{1}{1+\exp(-a-b)}}{1-\frac{1}{1+\exp(-a-b)}} \tag{5}$$

which reduces to $exp(a+b)$. Finally obtain the odds Ratio (OR) as

$$OR = \frac{\exp(a+b)}{\exp(a)} = \exp(b) \tag{6}$$

This means that the parameter b in the model is the natural logarithm of the odd Ratio.

3.2.2. Multiple Binary Logistic Regression Model

If there are p predictor variables x_1, x_2,...,x_p, the general form of multiple logistic regression model is as follows;

$$P(D) = \frac{1}{1+\exp(-a-\sum_{j=1}^{p} b_j x_j)} \tag{7}$$

Parameters b_1,...,b_p, were estimated using the maximum likelihood method. The parameter should give the significance of each independent variable to the outcome D. The estimated parameter forming the model was used to classify the remaining part of the data into either of the two groups.

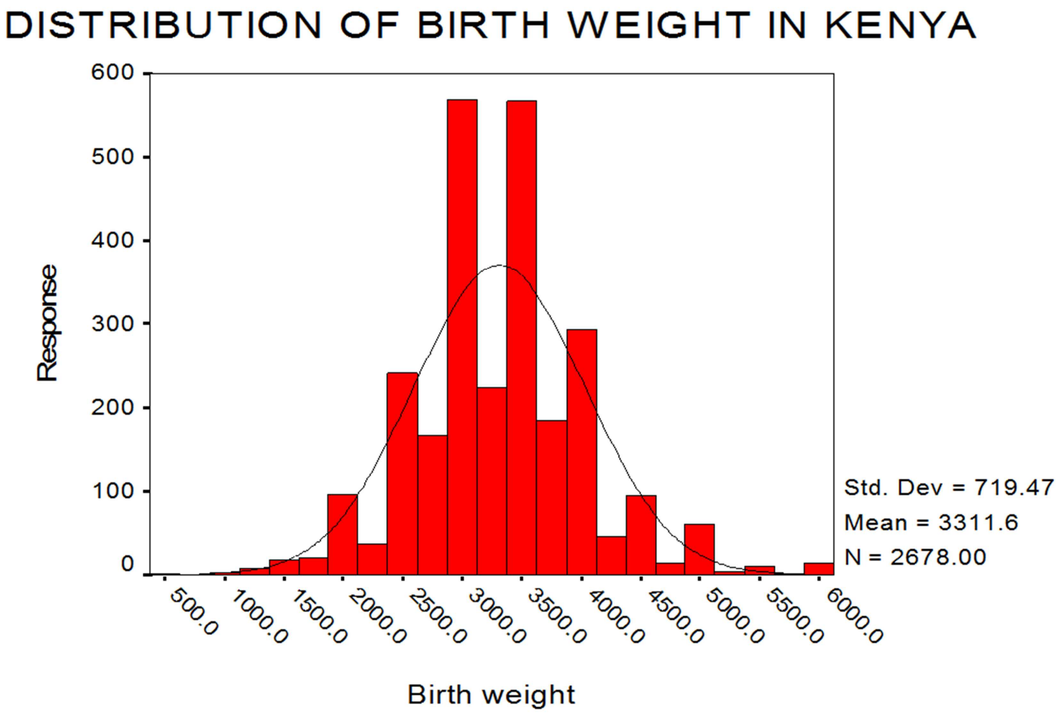

Figure 1. *The Histogram of Birth Weight in Kenya.*

3.2.3. Overall Model Fit

The null model -2 Log Likelihood is given by -2 * ln(L_0) where L_0 is the likelihood of obtaining the observations if the independent variables had no effect on the outcome. The full model -2 Log Likelihood is given by -2 * ln(L) where L is the likelihood of obtaining the observations with all independent variables incorporated in the model. The difference of these two yields a Chi-Square statistic which is a measure of how well the independent variables affect the outcome or dependent variable. If the P-value for the overall model fit statistic is less than the conventional 0.05 then there is evidence that at least one of the independent variables contributes to the prediction of the outcome.

3.3. Independent and Dependent Variable Encoding

Dependent variables were assigned values to separate them into two group i.e yes=1 which represents normal birth weight where by the weight of the child was greater or equal to 2500g and low birth weight No=0 which was less than 2500g .

Independent variable considered for this study included; Religion, Education Level, Time wanted pregnancy, Weight during pregnancy, Smokes nothing, Marital status and Economic status of the respondent.

4. Empirial Results and Discussion

4.1. Histogram of Birth Weight in Kenya

The majority of women recorded birth weight of their children between the interval of 3000g and 4000g as shown in Figure 1.

Figure 1 shows that a mean of 3311.6 g of birth weight and standard deviation of 706.16. This indicates a large variation within the birth weights in Kenya.

4.2. Categorical Determinants

4.2.1. Respondent's Religion and Birth Weight

The respondents were grouped into five categories namely Roman Catholic, Protestants/other Christians, Muslims, no religion and others. The contingent table indicates the numbers of respondents on religion on birth weight as provided in Table 1.

Table 1. *Respondent's Religion and Birth Weight.*

	Birth weight		Total
Religion	Normal	Low	
Roman Catholic	321(87%)	50(13%)	321(100%)
Protestant/other Christian	1010(91%)	105(9%)	1014(100%)
Muslim	123(96%)	5(4%)	123(100%)
No religion	8(89%)	1(11%)	8(100%)
Other	3(75%)	1(25%)	3(100%)
Total	1465(86%)	205(14%)	1469(100%)

Chi-square Value=35.26, df=4, p-value=0.773

Table 1, indicates that the respondents who were Protestants/other Christian had highest respondents on low birth weight of 105 (9%) women. It was found that 14% of the respondents recorded low birth rate. The chi-square table indicates association between religion and birth weight was not significant hence the religion has no association with birth weight of the child since the P-value=0.773>0.05.

4.2.2. Respondent's Education Level and Birth Weight

Education attained as a determinant was grouped into six categories, namely No education, incomplete primary, complete primary, incomplete Secondary, completed secondary and higher ass shown in Table 2.

Table 2. *Respondent's Education Level and Birth Weight.*

	Birth weight		Total
Educational attainment	Low (%)	Normal (%)	Percentage
No education	9.5	90.5	100
Incomplete primary	9.4	90.6	100.0
Complete primary	9.1	91.9	100.0
Incomplete secondary	9.0	91	100.0
Complete secondary	8.7	91.3	100.0
Higher	7.8	92.3	100.0
Total	14.0	86.0	100.0

Chi-square Value=23.17, df=5, p-value=0.115

Table 2 indicates that the respondents with no education recorded highest low birth weight of 9.5% where as those with higher education the lowest low birth weight. This implies that education level of the respondents influence birth weight of a child. The chi-square value=23.17 indicated that there was no association between education attained and birth weight since P-value=0.115>0.05.

4.2.3. Respondent's Time Wanted Pregnancy and Birth Weight

Time wanted pregnancy as a determinant was categorized into three groups namely then, later and no more. Where then means that the mother conceived unexpectedly, later where she had planned the time to conceive after birth and no more the mother had planned that after the birth she does not need any pregnancy.

Table 3. *Respondent's Time Wanted Pregnancy and Birth Weight.*

	Birth weight		Total
Time wanted pregnancy	Low (%)	Normal (%)	Percentage
Then	15.8	84.2	100.0
Later	7.4	92.6	100.0
No more	13.6	86.4	100.0
Total	13.1	86.9	100.0

Chi-square Value=19.35, df=2, p-value=0.000

This indicates the respondents who had conceived unexpectedly recorded highest low birth weight of 15.8%. The chi-square value indicates association between time wanted pregnancy and birth weight (P-value=0.000<0.05) which is significant hence the time wanted pregnancy has very strong association with birth weight of the child at birth.

4.2.4. Respondent's Weighed during Pregnancy and Birth Weight

Mothers were weighed during pregnancy and the distribution of the response was indicated as shown in the Table 4.

Table 4. *Respondent's Weighed during Pregnancy and Birth Weight.*

	Birth weight		Total
During pregnancy - weighed	**Low (%)**	**Normal (%)**	**Percentage**
Weighed	13.9	86.1	100.0
Not Weighed	8.5	91.5	100.0
Total	13.6	86.4	100.0

Chi-square Value=31.52, df=1, p-value=0.090

The pertinent results in Table 4, indicates that respondents who weighed during pregnancy recorded 13.9% on low birth weight. The chi-square value indicates association between weighed during and birth weight was not significant hence weighed during pregnancy has no association with birth weight of the child as evident by P-value=0.090>0.05.

4.2.5. Respondent's Smoking Status and Birth Weight

The respondents were grouped in to two groups namely smokes nothing and smoke.

Table 5. *Respondent's Smoking Status and Birth Weight.*

	Birth weight		Total
	Low (%)	**Normal (%)**	**Percentage**
Smokes	34.8	65.2	100.0
Smokes nothing	12.7	87.3	100.0
Total	13.0	86.8	100.0

Chi-square Value=26.01, df=1, p-value=0.023

Table 5 indicates that respondents who smoke recorded 34.8% on low birth weight. This implies that smoking affect the birth weight of the child. This evident by chi-square value of 26.01 and significance value=0.023<0.05. This indicates a statistically association between smoking status and birth weight at 5% significance level.

4.2.6. Respondent's Marital Status and Birth Weight

Current marital status was grouped in to six categories, namely never married, married, living together, widow, divorced, and not living together. The pertinent results are shown in Table 6

This indicates the respondents of current marital status recorded high low birth weight of 17.4%. The chi-square table indicates association between current marital status and birth weight was not significant hence current marital status has no association with birth weight of the child since (P-value=0.279>0.05).

Table 6. *Respondent's Marital Status and Birth Weight.*

	Birth weight		Total
Current marital status	**Low (%)**	**Normal (%)**	**Percentage**
Never married	17.4	82.6	100.0
Married	12.6	87.4	100.0
Living together	13.1	86.9	100.0
Widowed	0	100.0	100.0
Divorced	13.6	86.4	100.0
Not living together	12.7	87.3	100.0
Total	13.0	87.0	100.0

Chi-square Value=36.25, df=5, p-value=0.279

4.2.7. Respondent's Socio-economic Class and Birth Weight

Table 7. *Respondent's Socio-economic class and Birth Weight.*

	Birth weight		Total
Socio-economic class	**Low (%)**	**Normal (%)**	**Percentage**
Highest	12.5	87.5	100.0
Middle	14.7	85.3	100.0
Poor	14.9	85.1	100.0
Slum	15	85	100.0
Total	13.0	87.0	100.0

Chi-square Value=25.11, df=3, P-value=0.027

The Results in Table 7 indicates that respondents who stay in slums recorded high low birth weight of 15%. This could be attributed by health and nutrition factors as a result low income levels. The chi-square value indicates statistically significant association between economic status and birth weight. The statistical results are; Chi-square value=25.11 and P-value=0.027.

4.3. Results of Logistic Regression Model

This section presents results of a fitted binary logistic regression model.

Table 8. *Results of Logistic Regression Model.*

Variables	Symbols	B	S.E.	Wald	df	Sig.	Exp(B)
Religion	X_1	**3.1545**	**0.97025**	**12.34025**	**1**	**0.03**	**29.89425**
Education Level	X_2	0.8502	0.417	4.9296	1	0.286	3.8374
Time Wanted Pregnancy	X_3	0.262	0.136	3.708	1	0.014	1.299
Weight during pregnancy	X_4	-0.132	0.486	0.073	1	0.786	0.877
Marital Status	X_5	3.1388	0.208	2.5542	1	0.042	0.5308
Economic Status	X_6	-2.449	0.842	8.467	1	0.004	11.579
Constant		23.329	0.84	0	1	1	0.671

Table 8 shows the logistic regression coefficient, Wald test, and odds ratio for each of the predictors. Employing a 0.05 criterion of statistical significance, Religion, Time Wanted Pregnancy, Marital Status and Economic Status variables had significant effects on birth weight of the child. The exponentiated coefficients in the last column of the output are interpretable as multiplicative effects on birth weight. Thus, for example, holding all other variables constant, an additional unit of economic status decreases the likelihood of being a low weight by a factor of 11.56 on average. We observed that the significant values of the four variables (Religion, Time Wanted Pregnancy, Marital Status and Economic Status) were less than 0.05 (0.03 < 0.05, 0.014 < 0.05 and 0.004 > 0.05) meaning they are statistically significant and the others are not, hence not included in the model below. The Wald statistic tests the unique contribution of each predictor in the context of the other predictors.

The prediction equation in this article is thus:

$$In\frac{p}{1-p} = b_0 + b_1X_1 + b_3X_3 + b_5X_5 + b_6X_6$$

Where p is the probability of a child born has a low birth weight. Hence from the Table 8, we develop the following model.

$$In\frac{p}{1-p} = 3.1545X_1 + 0.262X_3 + 3.1388X_5 - 2.449X_6$$

This result shows that there exist a relationship between the birth weight, Religion, Time Wanted Pregnancy, Marital Status and Economic Status. The significance of the model is less than 0.05 hence the model is statistically significant. Predicted probability is 11.4%

5. Conclusion and Recommendation

5.1. Conclusion

This study was aimed at determining socio-economic factors that lead to low birth weight of children in Kenya. It was guided by the following objectives; to determine the contribution of socio-economic determinants associated to low birth weight and to derive the model that can predict birth weight of a child. Logistic regression analysis was conducted to predict whether an expectant mother was to give birth to Low Birth weight or not. Predictor variables were religion, Educational attainment, Time wanted pregnancy, weight during pregnancy – weighed, Smokes nothing, and economic status. Significant levels were observed for all the predictors on the dichotomous variable. The logistic function revealed a statistically significant association between the birth weight, Religion, Time Wanted Pregnancy, Marital Status and Economic Status. Predicted probability is 11.4% low birth weight.

5.2. Recommendation

To effectively enhance normal birth weight in Kenya, then expectant mothers should keenly focus on the socio-economic determinants by avoiding marital problems like divorce. Also the respondents should avoid conceived unexpectedly since it was associated with high low birth weight.

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