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Assessment the Predictors of Child Mortality in District Tharparkar, Sindh, Pakistan

Abstract:

The present research paper focuses on the predictors that are affecting on the child mortality which has emerged as natural calamity in District Tharparkar, Sindh. The Infant & child mortality was one of the major millennium development goals (MDGs), and also Sustainable Development Goal 2015-2030, “goal 3, ensure the healthy lives and promote well-being for all at all stages” has got extensive concentration and improvements, nowadays. This situation is excellent in the developed nations as they surprisingly have decreased child mortality rate, but on the other hand, the developing countries, like Pakistan, require a lot of efforts for considerable and extensive reduction in child mortality. Cluster sampling technique was applied to collect data from victimized families that were confirmed from the district health department. An interview scheduled was used as a tool which was consisted of structured and semi-structured questions. However, the child mortality was examined by the researcher himself, and three hundred interviews were conducted in the target population from the valid respondents. Logit Model and Multiple Regression were applied to observe the combined influence of explanatory variables on dependent variable. Multiple regression model show that the value of R-Square is 0.493. The value of R-Square is 0.493. This shows that the 49 percent change in children health status was explained by the six variables such as parents’ education, family structure, income, lack of medical facilities, shortage of food and believe on indigenous treatment in the model. This shows that overall model is statistically significant. Logit model is consisted two statistics i.e. Cox and Snell R^2 whose value is 0.41; indicates that 41% of total variation was explained by the explanatory variables in the chosen model and 59% by the other variables and/or by chance. Second is Nagelkerke R^2 whose value is 0.618; indicates that 62% of total variation is explained by the independent variables in the chosen model and 38% by the other variables and/or

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by chance. The present research reflects that number of predictors i.e. famine or drought, scarcity of food and safe drinking water, lack of medicine and unavailability of medical services in hospitals, low income, and low level education of parents were directly and indirectly hit the health of under five years' children and ended their life.

Keywords: Child Mortality, Predictors, Natural Calamity Multiple Regression, Logit model

INTRODUCTION

The Infant & child mortality is one of the major millennium development goals (MDGs), and also Sustainable Development Goal 2015-2030, “goal 3, ensure the healthy lives and promote well-being for all, at all stages” has got extensive concentration and improvements, now a days. This situation is quite favorable in the developed nations as they have surprisingly decreased child mortality rate, but on the other hand, the developing countries, like Pakistan, require a lot of efforts for considerable and extensive reduction in child mortality. More than one million children die every year on the first day of their life¹. Another research report shows that 1.2 million babies are born each year. Most of newborn babies' heartbeats stop due to uncaring labor, birth complication, maternal infection and by hypertension². In Pakistan 200,000 babies die in the first month of their birth because less than half of women had a skilled health worker near them at the birth of their child. The report shows that effort was made to improve the situation but they were hampered by delays in the salary disbursement, non-availability of medicines, dysfunctional equipment and a unhelping referral system. The traditional acceptance of environmental sanitation as a fundamental characteristic of lasting societal control of diarrheal disease is completely justified. The influence of bettered hygiene on infant diarrheal and associated mortality was less direct because of cause of infant diarrheal disease³.

The predictors of mortality have included certain diseases such as diarrhea, measles, Malaria, tetanus, diphtheria and pneumonia. Secondly, most of the previously described health technologies such as vaccines can be administrated on single occasion whereas nutrition intervention demands a more sustained approach, there has been a sharp emphasis on the facility of better antenatal care and better care during and after delivery. The leading causes of death among children under five in 2017 were preterm birth complications, acute respiratory infections, intrapartum-related complications, congenital anomalies and diarrhea. Neonatal deaths accounted for 47% of under-five deaths⁴. According to the Sindh Institute Indicator Survey 2014, the child death rate in Sindh was 82 deaths per 1000 live births (8.2 percent) and under five death rate was 104 per 1000. While, in Pakistan 86 babies died before the age of five out of every 1000 during 2012⁵.

Pakistan has the highest child mortality rate in South Asia. A study published in the Lancet medical journal is pointed out the difference in children's death in 194 countries. It also pointed out that sixty percent of the world 5.9 million children died before reaching 5 years of age last year. These children belonged to

ten countries in Asia and Africa, in spite of all efforts the number of deaths under five years' children was four million. This shocking trend is due to pneumonia prevailing in the country and lack of protection against it. Pakistan is seventh country in the world where every year 90,000 children die before the age of five years due to pneumonia and measles⁶. **Within Pakistan, Sindh has the highest rate, which is three percent more than the other provinces.** Pakistan Medical Association has pointed out how these unsafe and unhygienic practices drive Pakistan's high newborn mortality. The real causes of such a high newborn mortality are due to untreated or poorly treated maternal complications, inadequate neonatal care, and harmful homecare practices, such as discarding of colostrums, application of unclean substances to the umbilical cord stumps, and the failure to keep babies warm. Murad et al, stated that Diarrhea causes 3.3 million deaths per year but in Pakistan it is responsible for 43.3% of total infant mortalities. In KPK, the number of death from this disease is 15% and 16% in urban areas respectively⁷.

However, Tharparkar District is still (2018) suffering child mortality and five hundred children were expired⁸. The main purpose of this study is to identify and quantify the relative importance of various socio-economic factors and maternal care practices which have played significant role in determining child mortality

Objectives

- i. To Examine the predictors of child mortality
- ii. To study the physical, and social environment on child mortality.

METHODOLOGY:

Social scientists now use the sophisticated methodological tools and techniques in social research. Therefore, methodology is a frame for researcher. "The methodology is an arrangement of clear set of laws and actions on which the whole research build⁹. (Nachmias and Nachmias, 1996)". The Present study was designed to explore the predictors affecting the child mortality in District Tharparkar, Sindh, Pakistan. The population of the research was all those families who had suffered child mortality in Tharparkar District. Thus, three hundred victimized families were taken as a sample and it was drawn from four tehsils of District Tharparkar. Simple random sampling technique was applied to select the valid respondents for interviewing, and required data were collected with the help of District health department. So, the researcher procured the target population immediately. For the purpose of data collection Interview schedule was prepared as a tool for data collection. It consisted of structured, semi structured, and unstructured questions. However, the researcher physically met the valid respondents to collect the required data. The data were collected from different areas of District Tharparkar. Almost one & half month in 2017 were spent in the process of data collection. During this process, researcher came to know many other ground realities and aspects which were directly or indirectly related to the present research. After the data collection, the computer software SPSS was used for data analysis. While a series of procedures of coding the data was inscribed and examined with the assistance of Statistical Procedures for Social Science

(SPSS). Afterward, the data were distributed and interpreted in the frequency table. Cross tabulation was also done to see the relationship between different variables. Inferential statistic i.e. Logit Model and multiple regression was applied to streamline the opinion of the respondents in connection to examine predictors that were the main etiology of child mortality.

RESULT AND DISCUSSION:

For exploring relationship between two variables, the bivariate analysis was carried out. The significance of relationship between two variables is explored through chi-square test. It is well established fact in bivariate analysis, the relationships between variables which emerged sometimes spurious relationship because of confounding effect of other variables.

Bi-variate analyses showing the relationship between explanatory and dependent variables were described as under:

Hypothesis H0:Economic status will be influencing on mortality rate

HA: Economic status will not be influencing on mortality rate

Table 3: Relation among income of the respondents and number of children died in their family

Income	Mortality		Total
	Up to one child	More than one child	
Up to 4000	58	21	79
	73.4%	26.6%	100.0%
4100-9000	93	15	108
	86.1%	13.9%	100.0%
More than 9000	107	6	113
	94.7%	5.3%	100.0%
Total	258	42	300
	86.0%	14.0%	100.0%

Chi-square = 9.03 d.f. = 3 P-value = .011*

* = Significant

** = Highly-significant

Table 3 represents association among income of the respondents and number of children died in their family. Chi-square value ($\chi^2 = 9.03$) a significant ($p = .011$) which depicts an association among income of the respondents and number of children died in their family. So, the hypothesis “Economic status will be influencing on mortality rate” is accepted. The findings of in-hand research are coincided with this research that shows that low economic status has association with increased rates of infant and child mortality¹⁰. Another study is also rectified this finding¹¹. It is concluded that poor family economic condition was main predictor of child mortality.

Hypothesis H0: Parents’ education level will be influencing on mortality rate

HA: Parents’ education level will not be influencing on mortality rate

Table 4: Relation among fathers’ education and number of children died in their family

Education level	Mortality		Total
	Up to one child	More than one child	
Illiterate	155	32	187
	82.9%	17.1%	100.0%
Primary	83	5	88
	94.3%	5.7%	100.0%
Middle	20	5	25
	80.0%	20.0%	100.0%
Total	258	42	300
	86.0%	14.0%	100.0%

Chi-square = 12.34 d.f. = 2 P-value = .002**

** = Highly-significant

NS = Non-significant

Table 4 represents association among parents' education and number of died children. Chi-square value ($\chi^2 = 12.34$) a highly significant ($p = .002$) which depicts an association among parents' education and number of died children. So, the hypothesis "Parents' education level will be influenced on mortality rate" is accepted. The findings of these studies are similar which have established the influence of maternal education on infant and child¹². Another study is also rectified this finding¹³. It is concluded that maternal education was played an important role to reduce the child mortality.

MULTIVARIATE ANALYSIS

Bivariate analysis is commonly used to assess the co-variation and the direction of relationship between two variables. However, in most of the cases these relationships do not provide sufficient ground for the casualty of relationship. Therefore, in order to develop causal relationship, some other variables were inserted into the investigation. When more than two variables are introduced in analysis, it is commonly termed as multivariate analysis¹³. In present study, in order to observe the influence of explanatory variables on dependent variable multiple regressions procedure was carried out, which is one of the suitable techniques for developing causal relationship between explanatory variables and dependent/criterion variable. In order to identify whether the relationship is spurious or non-spurious, the multivariate analysis is carried out. The multivariate analysis also enables the researcher to find the relative significance of each independent variable in determining the dependent variable. The multivariate analysis also tells about the suitability of the independent variables in exploring the dependent variable.¹⁴

MULTIPLE REGRESSIONS:

Coefficients

Odel	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.644	.122		5.268	.000**

Education	.233	.034	.362	6.847	.000**
Wife's education	.109	.045	.128	2.434	.016*
Income	.096	.026	.183	3.749	.000**
Investment i.e.					
Take vegetables in daily nutrition	.160	.044	.179	3.629	.000**
Take fruits	.221	.042	.258	5.292	.000**
take supplement during pregnancy	.182	.042	.212	4.384	.000**

a. Dependent Variable: Children health status

* = Significant

** = Highly-Significant

NS = Non-Significant

The value of R-Square is 0.493. This shows that the 49 percent change in children health status was explained by the nine variables such as education, wife's education, family structure, income, no. of living children, take proper breakfast, take vegetables in daily nutrition, take fruits and take supplement during pregnancy in the model. This shows that overall model is statistically significant. This too suggests that the model is highly significant.

- Regression coefficient .233 shows that education of the respondents had highly significant and positive relationship with children health status. It means educated parents children had good health status. So the hypothesis “parents’ education will be influencing on children health” is accepted.
- Regression coefficient .109 shows that wife’s education had significant and positive relationship with children health status. It means mothers’ education had positive impact on their children’s health status. So the hypothesis “parents’ education will be influencing on children health” is accepted.
- Regression coefficient .096 shows that income of the respondents had highly significant and positive relationship with children health status. It means high income families’ children had good health status as compared to low income families’ children. So the hypothesis “economic status of parents will be influencing on children health” is accepted.
- Regression coefficient .160 shows that there are a positive and highly significant relationship between take vegetables in daily nutrition of the respondents and their children’s health status. So, they hypothesis “balance diet of the parents will be influencing on children health” is also conformed.

- Regression coefficient .182 shows that there is a positive and highly significant relationship between take supplement during pregnancy by the mothers and their children’s health status. It means, if the mothers were taking supplement during pregnancy then their children had also good health. So the hypothesis “balance diet of the parents will be influencing on children health” is also conformed.

These findings are rectified by logit mode which are explained as under:

PREDICTORS OF MORTALITY IS EXPLAINED

The impact of study variables on mortality of children has been studied by using the logit model. The value of log-likelihood (-2LL) is 217.280 indicates that the effect of independent variables through the purposed model is significant and hence model estimation or fit of the model has been improved. There are two further statistics required to explain the features of the model. First is Cox and Snell R² whose value is 0.41; indicates that 41% of total variation is explained by the independent variables in the chosen model and 59% by the other variables and/or by chance. Second is Nagelkerke R² whose value is 0.618; indicates that 62% of total variation is explained by the independent variables in the chosen model and 38% by the other variables and/or by chance. Both of these measures technically called pseudo R² and its value could hardly be tested through inferential approaches of the statistics¹⁵Resultantly; it could not be considered the good measure of goodness of fit for the purposed model¹⁶.

Table 1: Binary Logistic Regression Model

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	217.280 ^a	.41	.618

a. Estimation terminated at iteration number 6 because parameter estimates changed by less than .001.

	B	Wald	Sig.	Exp(B)
Education	-1.321	10.256	.001**	.267
Income	-.604	5.723	.017**	.547
Investment on health	-.300	.765	.382 ^{NS}	.741
Knowledge	-.528	1.455	.228 ^{NS}	.590
Visit	-.638	5.712	.017*	.528
Constant	2.652	9.250	.002**	14.189

* = Significant

** = Highly-Significant

NS = Non-Significant

Education of mothers: Increase in mother education contributes in decrease in child mortality rate. The odds ratio for the explanatory variable education is 0.267 and it tells that if the education of mothers will be enhanced by one-unit (a year of further schooling), there are 0.267 times chances for decreasing mortality rate of children will likely to be improved.

Household income: The variable income indicates the collective income of the respondents from all legitimate sources. The estimated coefficient of income is negative and significant. It indicates that there is a negative relation between mortality rate and the income of respondents. The odds ratio of income is .547 and it explained that for each unit increase of income, there will be .547 times more chances for decreasing the mortality rate.

Investment on health: The variable investment on health indicates the all expenditure on health of the respondents. The estimated coefficient of investment is negative and non-significant. It indicates that there is a negative relation between mortality rate and the investment on health of respondents. The odds ratio of income is .741 and it explained that for each unit increase in investment on health, there will be .741 times more chances for decreasing the mortality rate.

Knowledge about balance diet during pregnancy: The estimated coefficient of Knowledge about balance diet during pregnancy is negative and non-significant. It indicates that there is a negative relation between mortality rate and Knowledge about balance diet during pregnancy of respondents. The odds ratio of income is .590 and it explains that for each unit increase in knowledge, there will be .590 times more chances for decreasing the child mortality rate.

Visit to hospital (Checkup during pregnancy): The estimated coefficient of visit to hospital is negative and significant. It indicates that there is a negative relation between mortality rate and checkup during pregnancy of mothers. The odds ratio of income is .528 and it explained that for each unit increase in visit, there will be .528 times more chances for decreasing the child mortality rate.

CONCLUSION:

The present research reflects that number of predictors were affecting on child mortality in the targeted population area. These predictors i.e. famine or drought, scarcity of food and safe drinking water, lack of medicine and unavailability of medical services in hospitals and unnecessary political involvement were directly and indirectly hit the health of under five years' children and ended their life. Moreover, low level education of parents, low income, and lack of the balance diet of the parents and children were the main predictors of child mortality in District Tharparkar Sindh. Governments are starting to learn from the people who are responsible for the health of the population that "every child born healthy is entitled to become a normal, healthy and useful citizen". The problems of the children are to be studied separately from the other social phenomena. The child must be considered as relation to his family, the educational, physical and social conditions of the children of the country reflect the clearest index we have to our national life income also affects health directly or indirectly. Inferential statistic reflects that parents' education, income, medical facilities and environment were

directly affected on children health. Higher income has made the conditions to affect the quality of life by providing better goods by having better life conditions and by better housing and sanitation thus income is an important factor affecting health greatly and positively. Child mortality in Sindh was affected by low socio economic and environmental conditions that had main reason of child mortality in this region

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