

Identification Of Distinct Factors for Under Five Mortality in State of Maharashtra - An Evidence from NFHS-4

S. ABEENA SHANTINI 1*, S. JOSHUA DAVID 2**

¹Department of Statistics, S.D.N.B.Vaishnav College For Women, Chrompet- 600 044

²Assistant Professor, Department of Statistics, Madras Christian College, Chennai – 600 059

Corresponding Addresses:

* abeeshan777@gmail.com, **joshuadavid@mcc.edu.in

ABSTRACT

The National Family Health Survey (NFHS) is a large-scale, multi-round survey conducted in a representative sample of households throughout India. The primary objective of the study is to analyze the various contributing factors that influence child mortality, such as socioeconomic factors and biological factors, which are correlated with the child mortality for the state of Maharashtra from Indian states using the data from NFHS-4 (2015-2016). Whereas Maharashtra is thought to be one of the most densely inhabited, dirty, and recorded the greatest number of underweight children in mortality in demographic literatures. These are the recent focus on Millennium Development Goals where these indicators which are grappling with the elevated risk of child mortality.

In this context, we employed logistic regression, the most popular statistical technique incorporating categorical dependent outcome variables. When the dependent variable is dichotomous, it is utilized to determine the risk factors that affect child mortality.

Keywords: NFHS, Binary Logistic Regression, Under - five – Child Mortality, Social and Biological Factors

INTRODUCTION:

India continues to have serious levels of widespread hunger and malnutrition prevailing among children as well as adults. The NFHS is a collaborative project of the International Institute for Population Sciences (IIPS). Population-based surveys have been widely utilized to collect data in India on several aspects of health, nutrition, and healthcare, including fertility, mortality, family planning, maternal and child health. This information will assist policymakers and programme administrators in planning and implementing strategies for improving population, health, and nutrition programmes.

Malnutrition affects the present and future of a child, which causes problem to the economy too. The purpose of the paper is to examine and concentrate on significant indicators of child mortality in the state of Maharashtra under the age of five, as well as the various contributing factors that influence mortality, such as socioeconomic factors like place of residence, wealth index, weight of children and household variables women under the age 18, using Binary Logistic Regression that affect child mortality. It also aims to identify and improve those underlying and deficient factors among the underperformers. In general the overall levels of child malnutrition and child mortality are still considered to be very high among poor performing states in India.

Under-five mortality, which is used as a gauge of socioeconomic progress in developing nations, is defined as the likelihood of dying before reaching the age of five for every 1000 live births. Additionally, it depicts the population's quality of life and state of health care. 1 Infant mortality rate (IMR) dropped from 57 to 41 per 1,000 live births, and the under-5 mortality rate (U5MR) dropped from 74 to 50 per 1,000 live births,

DATA DESCRIPTION:

Data Source: NFHS -4 .The National Family Health Survey (NFHS) is a large-scale, multi-round survey conducted in a representative sample of households throughout India. The NFHS is a collaborative project of the International Institute for Population Sciences (IIPS).

Maharashtra child population under the age of five the data set was compiled using NFHS-4 secondary data. The study's variables included the Wealth Index, type of domicile, the mother's age when she gave birth, and the child's weight as some of the factors that affected the rate of child mortality. The main outcomes of interest for the present study are child mortality under the age of 5 years and factors. The factors significantly influencing child mortality in the state of Maharashtra were determined using binary logistic regression.

ANALYSIS AND INTERPRETATION

BINARY LOGISTIC REGRESSION MODEL:

The study's goal is to ascertain whether factors such as the kind of domicile, wealth index, mother's age under 18, and child weight have an impact on child mortality.

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	30.075	7	.000
	Block	30.075	7	.000
	Model	30.075	7	.000

The overall model is statistically significant, $\chi^2(15) = 30.075$, p - value = .000 ($< .05$).

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	2140.374 ^a	.003	.016

This above table contains the Cox & Snell R Square and Nagelkerke R Square values, where both the methods calculate the explained variations. These values are sometimes referred to as pseudo R² values (and will have lower values than in multiple regressions). However, we have interpreted in the same manner, but with more caution. Therefore, the explained variation in the dependent variable based on our model ranges from .3% to 1.6% on reference with the Cox & Snell R² or Nagelkerke R² methods, respectively.

Hosmer and Lemeshow Test (Goodness of fit (Model Diagnostic))

Step	Chi-square	df	Sig.
1	6.344	8	.609

As seen from the preceding table, the P-value is more than the level of significance at 5%, which is indicated by the P-value of (.609). We can infer that the data and model suit each other well. Our fitted logistic regression model is a good fit because the p-value is (.609), which is not significant.

Results of Binary Logistic Regression Model

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
Step 1 WEALTHINDEX			15.255	4	.004			
1 ^a WEALTHINDEX(1)	-.527	.270	3.804	1	.051	.590	.348	1.003

WEALTHINDEX(2)	-.712	.235	9.152	1	.002	.490	.309	.778
WEALTHINDEX(3)	-.255	.233	1.195	1	.274	.775	.490	1.224
WEALTHINDEX(4)	-.016	.235	.005	1	.945	.984	.621	1.560
TYPEOFPLACEOFRESIDENCE(1)	-.319	.159	4.039	1	.044	.727	.533	.992
UNDER AGE 18 (1)	-1.248	.531	5.524	1	.019	.287	.101	.813
CHILD'SWEIGHTINKILOGRAMS	.023	.010	5.008	1	.025	1.024	1.003	1.045
Constant	3.846	.236	265.253	1	.000	46.817		

With several independent variables, on performing Binary Logistic Regression to assess the effect variables on child mortality reveals that the factors of lower socioeconomic background that is from poorest and poorer shows significant values of (.051 , .002) , the type of residence(urban) of (.044), the children's weight of (.025), and the mother's age being under 18 of (.019) these are variables which shows significance on the likelihood of dying on the child under 5. The overall model was statistically significant when compared to the null model, $\chi^2(15) = 30.075$, p - value = .000 (< .05), explained the variation of survival ranging from 3% to 1.6% on reference with the Cox & Snell R2 or Nagelkerke R2 methods.

This table also predicts the probability of an event occurring based on a one-unit change in an independent variable when all other independent variables are kept constant. This table provides the regression coefficient (B), the Wald statistic (to test the statistical significance) and the all-important Odds Ratio (Exp (B)) for each variable category.

It has been revealed that people from lower socioeconomic backgrounds are more likely to die than those from higher socioeconomic backgrounds, as shown by the estimated odds ratios for poorest of (.590) and for poorer of (.490) in the above table. In a similar vein, the estimated odds ratio of (.727) shows that persons in urban society have a higher mortality toll than those in rural settings. Based on the aforementioned table, the estimated odds ratio of (1.024) shows that the children's weight in kilograms also significantly affects the likelihood that a child will survive to adulthood, along with the mother's age being under 18 with odds ratio of (.287) also have a crucial part in children's mortality.

CONCLUSION:

According to the current study, the results of the logistic regression analysis showed that, when compared to other counterpart variables, a lower socioeconomic background(poorest ,poorer), the type of residence (urban), the children's weight, and the mother's age being under 18 were significant predictor variables that appeared to have an impact on the child's mortality in the state of Maharashtra.

According to the findings, actions must be done based on socioeconomic status, and mothers under the age of 18 should get education about the worrisome effects of early pregnancy, which will raise the child death rate. The underperforming states continue to lag behind. To raise the community's economic standing, strategies are required. To increase child survival in India, healthcare policies and programmes need to be specifically created to include individual-level treatments focusing on young mothers.