

Rural Community and Determinants of Child Mortality in Uttar Pradesh, India: Evidences from the Field

Extended Abstract

I Introduction:

The intensity of child mortality in any region is a proxy indicator of health of the population and also works as a gruff index of socio-economic determinants of development of any region. Several national and international organizations like Center for Public Impact (CPI) and World Health Organization (WHO) have accentuated their efforts in this direction in order to reduce the level of child mortality and aggrandize greater child survival. Though India's infant mortality rate explained as death per 1000 live birth has fallen from 80 in 1990 to 33 in 2017, high rates are still prevailing in states like Uttar Pradesh with an Under 5 Mortality Rate (expressed as U5MR) of 41 deaths per 1000 birth in 2017 (SRS, 2019). According to a study published in The Lancet in 2020, 'The highest number of under-5 deaths 312,800 in 2017 were in the state of Uttar Pradesh which included 165,800 neonatal deaths'(PTI 2020). This is on account of a weak public health system and a fast growing and highly unregulated private health care delivery system existing in the state. It is in this background this empirical paper attempts to analyze the determinants of child mortality in rural Uttar Pradesh.

II Materials and Methods:

The research is based on mixed methods. The qualitative data is collected through field survey from four districts of Uttar Pradesh, one each from four administrative regions namely Bundelkhand, Western, Eastern and Central of Uttar Pradesh so as to have equal representation of all the administrative regions of the state. The basis of selection of these districts from each region was highest Child Sex Ratio (CSR) as reported in 2011 Census to bring uniformity in selection of sample. We opted for these districts just to understand the status of child mortality in the districts which have maximum child sex ratio as per Census 2011. Multistage sampling procedure was followed to choose respondents. A sampling frame consisting of all the community development blocks was prepared for each district. From each district, two community development blocks on the basis of highest and lowest child sex ratio as per Census 2011 were taken. Again from these blocks, two villages were selected who had maximum and minimum CSR as reported in Census

2011 and also which had more than 100 households were selected so as to maintain uniformity in selection of data. Thus, total sample size is 320 households.

The survey had been conducted with the help of structured interview schedule for the sample selected. Focus group discussions (FGDs) and in-depth case study method was used to give further insight into the problem. Regarding the FGDs the research team had pre-decided questions to be asked in the group and the responses were noted point-wise systematically in the field notes. Regarding the case study method the researcher/ interviewer used to talk in detail so as to record personal stories which were relevant to the field of research.

Some of the limitations of this study have been briefly mentioned. Firstly, we could not use any digital recording method as the respondents were apprehensive and uncomfortable in getting their statements recorded. Therefore, we noted their narrations, noticing their facial expressions, long pauses in field diaries. During our interactions a common problem which we encountered was that the respondents were not allowed to speak in privacy. Either the husband or mother-in-law or any other family member was always around them and therefore, we also had to take precautions while framing our questions while extracting information.

To corroborate our findings obtained from the primary data, we have applied the logistic regression technique to determine the factors responsible for occurrence of child mortality which is the response variable and is binary in nature (Yes:1; No: 0). Previous studies including different NFHS rounds have attempted to identify the determinants of child mortality in rural areas (Mukherjee *et.al* 2019, Khan and Awan 2017, Duarte-Gómez María *et.al* 2015, Klaauw and Limin 2004. Another study by Kousar *et.al.* (2020) suggest that there is a significant impact of education of mother, access to improved water and sanitation facilities, and income inequality on child mortality.

Going through the literature, we could not find many studies on the determinants of child mortality in Uttar Pradesh except for government reports. Therefore, we decided to undertake this study. On the basis of review of literature and from field observations we were able to understand the reasons of child mortality. This helped us to frame our independent variables which could impact child mortality explained in terms of pre-natal and under 5 years mortality. The explanatory variables considered for the model are age of the mother at the time of birth of first child, mother's education, type of delivery, child preference, size of the family of the respondents and toilet facility in the household which are categorize in table 1.

Table 1: Description of Determinants Responsible for Child Mortality

S.No.	Description and Name	Categories
1	Mother's age at the time of birth of first child	Continuous variable
2	Mother's Education	No education + Primary=1, Above primary =2
3	Type of delivery	Institutional =1, Non-Institutional = 2
4	Child Preference	Male =1, Female=2
5	Size of the family	Small (upto 5 members)-1, Large (More than 5 members)-2
6	Toilet Facility	Sanitary-1, Non- Sanitary-2

Dependent Variable: Child Mortality (Yes: 1; No: 0) defined as children dying before reaching the age of 5 years

Model

LOGIT (Child Mortality) = $\alpha_0 + \alpha_1$ Mother's age at the time of birth of first child + α_2 Mother's Education + α_3 Type of delivery + α_4 Child Preference + α_5 Size of the family + α_6 toilet facility + ϵ_{2i}

III Analysis and Discussion:

The explanatory variables considered for the model have already been defined in the methodology section of this paper. The logistic regression model is statistically significant [χ^2 (6) = 40.949, $p < 0.01$]. The model explained 17.3% (Nagelkerke R^2) of the variance in likelihood of occurrence of child mortality and correctly classified 71.0% cases by model. Variance inflation factor (VIF) for the determinants is approximately 1, which also indicates that there is no multicollinearity between the variables (Refer Table 2).

Table 4: Determinants of Child Mortality

Region	Variable	B	S.E.	Wald	Sig.	Exp(B)	VIF
Rural	Mother's age at time of birth of first child	-0.098	0.042	5.33	0.021	0.907	1.041
	Mother's education (No or Low edu.)	1.306	0.324	16.229	0	3.691	1.063
	Type of delivery (Institutional)	-0.718	0.275	6.809	0.009	0.487	1.119
	Child Preference (Boy)	0.546	0.302	3.266	0.071	0.58	1.036
	Size of the family (Small)	0.001	0.299	0	0.998	1.001	1.109
	Type of Toilet (Sanitary)	-0.397	0.383	1.074	0.3	1.487	1.016

Constant	0.673	0.968	0.483	0.487	1.96
Hosmer and Lemeshow Test p value	0.985				
-2 Log likelihood	344.020				

(a) Mother's age at time of birth of first child

In our sample the mean age of mothers at the time of giving birth to first child is 20.5 years. Our statistical results exhibit negative association with child mortality implying that as the age of mother increases at the time of giving birth to the first child, there is a reduction in the likelihood of occurrence of child mortality. This variable has a significant ($p < 0.05$) impact on the occurrence of child mortality. So it is important that the marriageable age for the girls especially in the rural areas should not fall below 18 years which is also the permissible legal marriageable age in the country so that they conceive when they are ready for the conception physically.

(b) Mother's education

Mothers' educational level increases their skills in healthcare practices related to disease treatment, preventive care, hygiene, and nutrition, thus improving chances of child survival. Our field observations revealed that even low levels of education (incomplete primary education) were found significant in reducing the odds of mortality in 1 to 24 months old children. From the statistical analysis of our primary data we could corroborate these findings also. The education of the mother (as respondents) has been found to be a significant factor ($p < 0.01$) in rural areas in all the four districts to influence the health of the child both at the pre-natal and post-natal level. The likelihood of child mortality in those families where mother is having No or low level of education is 0.271 (=1/3.691) times high than those families where mother is having better or higher level of education in rural areas. So as a policy outcome the focus of the governments should continue to increase the female literacy level in general and for rural areas in particular since the Census 2011 data reveals low rural female literacy at 54 per cent only, for Uttar Pradesh and 57.93 per cent at the all-India level.

(C) Type of Delivery

The third determinant in this analysis is the place of delivery of the child, whether the birth has taken place under any medical or trained supervision (institutional) or at home (non-institutional). The type of delivery has been found to be a significant factor ($p < 0.05$) in rural area to influence the likelihood of child mortality. The likelihood of child mortality in those families where birth

of the child is institutional is 2.053 ($=1/0.487$) times less than those households in which the birth of child is non-institutional.

(d) Child Preference

Significant imbalance in India and especially in northern region has been a result of son preference and sex determination test, which been well documented in several Asian countries, including India and China. Sons are regarded as assets in their family and daughters a cause of misery. Statistically also we found that the likelihood of child mortality is 1.724 ($= 1/0.580$) times higher in those families in which there is more preference for boys than girls in rural area. Hence, child preference is an important variable ($p < 0.10$) for occurrence of child mortality.

An important policy suggestion regarding this determinant may be that intense awareness drive at regular intervals should be held so as to sensitize the people towards importance of girl child and consequences of Gender imbalance in the society. The deep-rooted patriarchal mindset needs to be targeted in rural communities so that they are able to change their perspective towards gender bias.

(e) Size of the Family

Strong son preference in the society results in large family size in the society and has demographic implications. This large family size impacts maternal health thus, affecting the health of the unborn as well as new born child. The data from our field also corroborates this mindset in all the four districts where the meta son preference is as high as 97.2 percent which leads to a greater number of children. However, our statistical results indicate that the impact of size of family on occurrence of child mortality is not a significant variable. This is because as per our respondents having three children is a normal family size for them. Still if we look into this determinant from a macro view then size of the family affects the health of the mother which has a direct impact of child mortality. Therefore, steps must be taken to change the mindset of the males and they should also be encouraged to adopt family planning measures.

(f) Toilet facility in the household:

In rural areas impact of hygiene of the household on child mortality came out to be an insignificant factor. It is in place to mention that Clean India Campaign alias Swachh Bharat Mission (SBM) was launched on 2nd October 2014 on the occasion of Gandhi Jayanti, and it focused on a shift from open defecation (OD) to use of toilets by triggering behavioral change at community level at the rural level in particular. This envisaged that this enabled communities to talk about OD and

usage of toilets. In our model, type of toilet in the household has been found to be an insignificant factor to influence the occurrence of child mortality although there is a negative association between the sanitary toilets and the likelihood of the child mortality that means with the increase in the sanitary toilets the likelihood of child mortality will be decreases.

IV Conclusion:

Despite the long history of well-intentioned family welfare policies and some recent progress, maternal and child mortality in India remains high. In 2019 the Intensified Mission Indradhanush 2.0 was launched in Uttar Pradesh to cover all blocks of the state. The role of frontline workers becomes important in implementation of such programmes at the grassroot level. During our field investigations we found that frontline workers are contributing in making such programmes successful. However, since a large section of the infant deaths are early neonatal deaths, strengthening the institutional delivery system will add to a decrease in the overall infant mortality in a state. In the Health index 2018 launched by National Institution for Transforming India (NITI) Aayog Uttar Pradesh was the least performing State placed at rank 21 with an overall score of 28.61. The proportion of institutional deliveries, for example, a crucial health indicator, was down from 52.4 per cent in 2015-16 to 50.6 per cent in 2017-18, the lowest among states. Inadequate facility density is one barrier to access. This shortage of public healthcare institutions further impacts the implementation of centrally sponsored health programmes, which in turn, require an effective network of public health institutions. This itself shows the dismal picture of the state in terms of health services, their outreach and improper health infrastructure.

Given these kinds of issues there is an immediate need to take action against malpractices, stricter monitoring of indicators relating to these goals might result in better immunization coverage and higher rates of institutional delivery so as to have sustainable health system. More awareness regarding intra-partum care with continued ratification of policies can have greatest impact on maternal and new born survival. The issues at the ground level needs to be addressed more strongly like increasing the availability of doctors in accordance to WHO norms. There is an urgent need to increase the number of specialized neonatal care centers in rural areas so as to facilitate the handling of the complicated cases, thus, increasing the chances of infant survival.

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