Women's empowerment and child mortality: the case of Bangladesh

Il ruolo della donna nella lotta alla mortalità infantile: il caso del Bangladesh

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Abstract Bangladesh is the Southern Asian country that has been experiencing the highest absolute decline in the Under Five Mortality Rate in the past 15 years. This paper focuses on the importance of women's education and empowerment variables in explaining this extraordinary result. We use a two-level multilevel logistic regression to take into account the great differences among territorial communities in terms of child mortality reduction. It emerges that the importance of woman's empowerment - measured as individual and as mother - remains relevant even when the context is considered. A sensitivity analysis has been conducted to test the relevance of different indicators of female empowerment.

Introduction

The importance of female education for child survival in developing countries has been widely acknowledged [3;12]. Mosley and Chen [13] have been among the first scholars highlighting the importance of the mother's role, by arguing that women's education has positive effects on children's chances of survival. They argued that education allows mothers to increase their capabilities concerning nutrition, hygiene and treatment of illnesses, which in turn allows

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them to properly take care of their children. Women's education appears to affect child mortality both directly and indirectly, i.e. through its influences on gender equality and female empowerment [1].

In particular, research also showed that female empowerment is positively associated to child survival [7;8;10]. Authors who have been exploring such relationship, though, have been conferring to the term "empowerment" a wide meaning, for instance as a general holding of autonomy [7], by measuring it through several proxies: as decision-making power in the household, freedom of movement and employment status [8], as control of resources [10] and so on, hence implying for the relationship between female empowerment and child mortality to always retain its positivity, independently of how empowerment is measured. Kabeer [9], on the other hand, argued that "what mattered for achievements in relation to children's wellbeing was women's agency as mothers rather than as wives" [9:450]. She suggested to focus on indicators that are strictly related to women's ability to take action in safeguarding their children's healthcare, rather than on the ones concerning, for instance, equality within the marital relationship.

In this paper we aim to evaluate the relative importance of female empowerment and whether its importance changes if measured as possibility of agency towards the children's healthcare compared to female empowerment measured in terms of equality in the relationship between the parents of the children or in terms of women's agency in the social context.

The case study: Bangladesh.

Bangladesh makes an especially interesting case study because of its impressive improvements in terms of child survival: it is the country that, among all Southern Asian states, has been experiencing the highest absolute decline in the Under Five Mortality Rate in the past 15 years [6].

Comparing several rounds of Bangladesh Demographic and Health Surveys (BDHS) it emerges that as female schooling increase child mortality decreases, and this relation is steady over time. In Bangladesh DHS 2004 women who had no education have an Under Five Mortality rate (U5MR) equals to 114‰ live births whereas those with higher education have an U5MR of 58‰ live births. In BDHS 2014 they decrease respectively to 63‰ live births and 24‰ [6]. Moreover, a great deal of attention has been paid to Bangladesh in the literature concerning the role of female education and empowerment in child survival: empowering women has been pointed out as one of the most important factors behind the so-called "Bangladesh paradox", consisting in the sharp contrast between excellent health performances and reduction of mortality, and the malnutrition and low use of basic health services that still characterize the country [5].

Data and methods

The data utilized for this study derive from the Bangladesh DHS 2014. It is the 7th survey implemented by the DHS Program in the country, and it involved men and women in reproductive age, who provided also information about their children. The survey has been conducted on all the ever-married women, aged 12 to 49 years, selected through a two stage stratified sampling procedure: the first stage involved the selection of 600 territorial units (clusters) - 207 urban clusters and 393 rural ones; in the second stage, for every cluster has been selected an average of 30 households. Our study has concerned all the children born in the 10 years preceding the survey and their mothers. The response variable of the analysis was under-five death - that is, the death of a child before reaching his or her fifth birthday - recorded as a dichotomous variable[4]. The data for estimating child mortality derive from the birth history of the Women's Questionnaire, where were collected information about all their live born, such as sex, month and year of birth, survival status, age at the moment of the interview or age at death in case of deceased child [10]. The subsample utilized in our study concerned a total of 16,439 children born in the 10 years preceding the survey and 10,856 women, that is, the mothers of such children.

As already mentioned, the main focus of this work is the effect of different indicators of female empowerment. In particular, we compare the results of:

- A measure concerning female empowerment as education, categorized in four modalities: no education, primary education, secondary and higher education. Note that this variable only concerns women who had completed their education before getting married;
- Three indicators measuring women's empowerment in terms of equality within the couple: an indicator concerning the woman's freedom of movement; a variable measuring the number of decisions to which women participate in the household; a variable quantifying the number of occasions in which women tend to justify violence from the husbands;
- An indicator concerning the woman's possibility to act towards her children's wellbeing: a variable investigating who has the final say final say on children's health care.

All the models estimated in the next section control for individual characteristics of the child (sex, birth order, birth interval), of the mother (mother's cohort and age at birth), of the household (wealth index (WI)[4] and availability of electricity)

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[4] We excluded those born less than 59 months before the end of the survey, as they were not exposed to five full years of risk of dying.

[5] WI is a composite measure of a household's cumulative living standard calculated by DHS. It relies on household's ownership of selected assets (such as televisions and bicycles), materials used for housing construction and types of water access and sanitation facilities.

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and of the context (percentage of uneducated men, uneducated women, rich and richest households, households with electricity in the cluster, and type of residence).

We employ a two-level multilevel logistic regression approach, based on the calculation of adjusted odds ratios of under-five mortality according to the selected explanatory variables. The choice of a multilevel approach is consistent with the very clustered nature of the DHS data; the use of a multilevel approach allows for the correction of the bias that may occur in the estimation of the parameters resulting from such clustered structure. This option has been selected to give relevance to the influence that territorial context may have on children's survival. As Matteson et al. argued, even though there may be optimal individual-level conditions, "*the absence of adequate health care in the community, living in a congested urban environment or living in the context of high poverty may have independent negative consequences for her [a mother's] infant's well-being and survival*" [11:1884].

Preliminary results

To analyse how the five different measures of women empowerment influence under-five mortality in Bangladesh we fitted 10 multilevel random slope models (see Table 1) with individual and contextual variables: models 1, 3, 5, 7 and 9 control only for individual determinants, whereas models 2, 4, 6, 8 and 10 add the control of contextual determinants to highlight the significance of the effect of community.

Model 1 and 2 provide odds ratios of under-five death according to the educational level of the mother without and with the contextual-level variables. It emerges that mother's education has a strong protective effect in terms of child survival: the odds of under-five mortality among children born to women with a secondary or higher education are 29% lower than the probability of those born to uneducated women. Such effect is retained also including contextual factors (model 2): having a "higher" educational level retains its protective effect in terms of under-five survival, and this result is still statistically significant even when controlling for the percentage of uneducated males and females in the cluster, which means that the low educational level of the mother has a significant impact on child mortality independently from the average educational level of men and women within the cluster. As the literature on the matter showed, educated mothers are more likely to bring their children to healthcare facilities [4], are more conscious and more enlightened (which helps them to make better decisions for themselves as well as for the family) and can better communicate and interact with health service providers to get required care for themselves as well as for their newborn [2].

Models 3 to 8 display the odds ratios of under-five mortality in correspondence of a) mothers that have freedom of movement; b) mothers who participate to

decisions within the household and c) mothers who justify wife-beating. We can see that mothers' possibility to move freely (that is, alone or with her children), her decisional power inside the couple and her attitudes towards wife-beating do not affect the odds of child mortality. Such results remain unchanged even when controlling for contextual-level variables.

Table 1 – Results of multilevel random slope models (odds ratio and significance level) with individual and contextual covariates

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
Mother's cohort [ref.1964-68]										
1969-1973	.57*	.57*	.57*	.57*	.52**	.52**	.56*	.56*	.54**	.54**
1974-1978	.56*	.56*	.58*	.59*	.56**	.54**	.58*	.58*	.57*	.57*
1979-1983	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
1984-1988	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
1989-1993	.39**	.38**	.43*	.42*	.44*	.44*	.41*	.41*	.46	.46
1994-1999	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Mother's age at child birth [ref. 15-19 ys]										
20-24 ys	.76*	n.s.	.73*	.74*	n.s.	n.s.	.73*	.73*	.79	n.s.
25-29 ys	.46***	.46***	.44***	.44***	.46***	.47***	.41***	.42***	.48**	.49**
>29 ys	n.s.	n.s.	n.s.	n.s.	.68**	n.s.	n.s.	n.s.	n.s.	n.s.
Sex										
Female	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Birth order [ref. Firstborn]										
2°	.65***	.65***	.68**	.67***	.68**	.67**	.67***	.67***	.66***	.66***
3°	.69*	.68*	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
4°	n.s.	n.s.	n.s.	n.s.	1.42*	n.s.	1.42*	n.s.	n.s.	n.s.
Birth interval [ref. <24 months]										
>24 months	.61***	.61***	.62***	.62***	.58***	.59***	.60***	.61***	.59***	.59***
Wealth index [ref. Poorest/poor]										
Medium/ Richest HH	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Electricity in the HH [ref. No electricity]										
Yes	.68***	.77*	.68***	n.s.	.70**	n.s.	.68***	n.s.	.70**	n.s.
Education of the mother [ref. No education]										
Primary	n.s.	n.s.								
Secondary/higher	.71**	.74*								
Mother has freedom of movement [ref. No]										
Yes		n.s.	n.s.	n.s.						
Mother participates to household's decisions [ref. No]										
Yes					n.s.	n.s.				
Mother justifies wife-beating [ref. No]										
Yes							n.s.	n.s.		
Mother participates to her children's healthcare decisions [ref. No]										
Yes									.72***	.73***

n.s.: not statistically significant at 10%, *p<0.10; **p<0.05, *** p<0.01; all models include constants. Note that all the odds ratio should be interpreted in terms of association, and not of causality.

Eventually, models 9 and 10 allow us to shed more light on the relationship between the women's empowerment as mothers – measured as possibility of agency when it comes to their children's healthcare - and their children's survival. It appears that such measure of women's empowerment does have a protective effect in terms of child survival: children born to women who have the final say in decisions concerning their kids' healthcare have 29% lower odds to die before reaching their fifth birthday, compared to those born to women who do not have any say on kids' healthcare. Such protective effect is retained

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even when the contextual factors are included in the model as control, and the result stays statistically significant.

Hence, it appears that women's education has a statistically significant effect on child mortality both when controlling only for individual-level variables and when including the contextual-level ones, and so does women's empowerment – when measured in terms of possibility to act when it comes to their children's healthcare. This latter result is consistent to what Kabeer [9] argued, that is, that what matters is women's agency as mothers rather than as wives. Indeed, in our analysis the measure focusing on women's ability to take action in safeguarding their children's healthcare has a significant, protective effect on children's survival, whereas measures of empowerment in terms of equality within the marital relationship do not show any significant impact on the chances of child survival.

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