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The Pervasive and Persistent Influence of Caste on Child Mortality in India

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Abstract

This study examines the effect of caste on child mortality and maternal health care utilization in rural India using data from National Family Health Survey (NFHS-2) carried out during 1998–99. Results from multilevel discreet-time hazard models indicate that net of individual-level and community-level controls children belonging to low castes have higher risk of death and women belonging to low castes have lower rates of antenatal and delivery care utilization than children and women belonging to upper castes. At the same time, the controls account for most of the differences within the low castes. Further analysis shows that the mortality disadvantage of low castes is more pronounced in poorer districts. These results highlight the need to target low caste members in the provision of maternal and child health services.

Keywords: Caste; Mortality; Health Care Utilization; Community; India

Introduction

Caste system has been at the core of social organization in India for centuries. Sociologists have studied the caste system both to comprehend it and as a field from which broader sociological principles could be formulated (Milner, 1994:3). In contrast, most of the demographic studies of caste have focused narrowly on particular sub-castes with emphasis on distinctive local or cultural explanations (Maharatna, 2005). Though such studies provide invaluable insights into the working of the caste system at the local level, there is a need for "contextualization of local studies within broader national and regional context" (Dharmalingam & Morgan, 2004:529). In this paper, we examine the influence of caste on child survival using an explicitly broader approach with the intent of providing both India-specific explanations and contributing to the extant literature on group differences in child mortality.

The significance of caste has attracted a range of views from the post-colonial theorists holding caste as a colonial construction (Ludden, 1993; Inden, 1990; Dirks, 1989;) to scholars treating caste as a key organizing element of pre-colonial Indian society (Béteille, 1996; Srinivas, 1989). Notwithstanding these polarized interpretations, caste was and remains a reality in the everyday experience of life for the vast majority of Indians (Bayly, 1999). The official classification defines four categories of caste: Scheduled Caste (SC), Scheduled Tribe (ST), Other Backward Classes (OBC) and Forward Caste (FC). In the SC category are ex-untouchable castes and in ST are nearly 400 tribal groups, combined both of these groups occupy the lowest level in the caste system. In the OBC category are caste groups that the Indian government compiled based on the historical status occupied by a particular caste and the current social condition of its members. The reality of the caste system, however, is much more complex, with thousands of sub-castes and diverse regional nuances, which have deterred researchers from studying the commonalities that could influence demographic outcomes. One such commonality is the social

and economic deprivation of the low castes. In an effort to redress the historical injustices suffered by members of low castes and to uplift their status, The constitution of India (article 46) directs the government to "promote with special care the educational and economic interests of the weaker sections of the people, and, in particular, of the Scheduled Castes and the Scheduled Tribes, and *shall protect them from social injustice and all forms of exploitation*"[italics added]. Despite half century of legislation and affirmative action programs, poverty is still higher among the Scheduled population than the non-Scheduled (Gang et al., 2002) and newspapers are replete with accounts of social injustice experienced by members of low castes. The milieu of continuing violence, disadvantages, and discrimination endured by the low castes is bound to have an impact on their health. In the next section, we discuss the pathways through which caste membership can affect child mortality and its proximate determinanats.

Caste and child mortality

Though child mortality differentials between castes have been noted in the literature, they have typically been assumed to arise from socio-economic differences. Similar to arguments made for race and class (see Navarro, 1990; Rogers, 1989), it has been argued that once the socioeconomic status of low caste rises, the caste mortality differentials would disappear (Mahadevan et al., 1985). Yet considering the history of the caste system and its contemporary manifestation, the substitutability of class for caste, as if they are synonymous, seems injudicious. As Dumont (1980) has pointed out in his seminal work *Homo Hierarchicus*, the caste hierarchy does not depend on material power but rather on status. Within the caste system the place occupied by an individual in the social hierarchy (social status) is largely divorced from her or his economic situation.

The influence of social status (including status that is derived from economic power) on health has been widely studied. Some studies have linked the subjective perceptions that individuals hold about their position in the social hierarchy to their health (Sapolsky, 2004; Singh-Manoux et al., 2003), others have used the concept of social capital as the mechanism through which social status can affect health (Kawachi et al., 1997). Researchers of racial and ethnic health disparities have noted several impediments in access and utilization of health services for members of historically disadvantaged groups (Frisbie et al., 2004; Burgard, 2002; Williams & Collins, 1995; Hummer, 1993). The spatial distribution of health services, such as the absence of health facilities in areas of high concentration of low caste members, can have a direct influence on access to health care. Even when health facilities are present in the community, discrimination by the provider would significantly limit the usage of those facilities by low caste members. Williams and Collins (1995:366) observation about racism as "incorporating the ideologies of superiority, negative attitudes and beliefs towards racial and ethnic subgroups, and differential treatment of members of these groups by both individuals and societal institutions" holds true for differential treatment of low caste. Thorat and Lee (2005) provide evidence of such discrimination in public programs including the public distribution system (set up to provide food items at subsidized prices for the poor) and the midday meal scheme in schools (that provides one meal a day for all children attending school). Also, similar to the case of racial differences in child mortality in the United States (Frisbie et al., 2004), members of low caste may lack social capital that would enable them to avail new technologies or through which knowledge about methods of preventing child illness and death could be gained. Such differences would be reflected in lower usage of antenatal and delivery care services.

The ascribed status of belonging to a low caste brings with it a host of disadvantages affecting life chances in areas like education, occupation, and income. Low castes have inferior average educational attainment, perpetuated both by structural barriers and by the internalization of low

self worth (Hoff and Pandey, 2004). The high incidence of poverty among low castes (Borooah, 2005; Deshpande, 2001, 2000) is aggravated by occupational segregation by caste (Mendelsohn & Vicziany, 1998). A glaring example of these disadvantages is the underrepresentation of low caste individuals in the government service, despite continuous attempts to boost their presence through quotas and similar measures (Mendelsohn and Vicziany, 1998; Vincentnathan, 1996). Because all of these disadvantages tend to affect child mortality, estimates of their effects will, to a certain degree, contain the effect of caste indirectly.

The effect of caste on child health and survival also depends on community characteristics. As (Robert, 1999:493) point out “social, service, and physical environments of communities” can have a direct effect on child mortality. One of the community factors that could influence child mortality is the community economic condition. For instance, living in a poor neighborhood could affect individuals’ health beyond their individual traits. The underlying premise of studies that have investigated the impact of community-level factors on demographic outcomes is that community-level factors mediate the relationship between individual-level factors and these outcomes (Jaffe et al., 2005; Kravdal, 2004; Moursund & Kravdal, 2003; Sastry, 1996). Applied to caste, this means that child mortality differentials across castes would be muted in affluent communities as such communities would have better social and health institutions and would be more conducive for transfer of knowledge and technologies, that could benefit all community members. In contrast, in poorer communities where resources are scarce and mechanisms for knowledge and technology transfers are less developed, the caste differentials would be more pronounced.

Analytical aims

The objective of this study is to provide evidence for the existence of caste disparities in child health and that such disparities cannot be wholly attributed to socioeconomic conditions or

community-level factors, and to gain insight on the causes of their persistence. We accomplish this by doing the following: (1) charting the trends in neonatal, postnatal, infant, and child mortality rates for a 10-year period and documenting the absolute and relative changes in these rates for caste groups; (2) estimating the effect of caste on child survival taking into account socioeconomic, demographic, and community risk factors; (3) examining the variation in the effect of caste by community economic status; and (4) assessing the effect of caste on antenatal care and delivery assistance.

Data and methods

Data for this study come from the National Family Health Survey conducted in 1998 (NFHS-2), the Indian version of the Demographic Health Surveys conducted in many developing countries (International Institute for Population Sciences (IIPS) & ORC Macro, 2000). The survey, focusing on fertility and reproductive health, was conducted in all the States, and the data set includes sample weights at state and national level to make the survey representative at each of this level. In total, NFHS–2 surveyed 90,303 women. Although caste divisions are present in other religions in India, we limit our study to Hindus because among them these divisions are particularly strong. We also combine the two lower caste groups, SC and ST, into a single category named SC/ST. Though NFHS-2 did not collect data on household income or expenditures, it has detailed information on household assets. Instead the dataset provides a wealth index that was created using information from household assests (see Table 1) – such an index has been shown to closely correspond with and as reliable as an index created using expenditure data (Filmer & Pritchett, 2001). Information on postnatal care was only collected for children alive at the time of the survey, so we have not included postnatal care in our models.

Multilevel discrete-time hazard models are used to analyze the effect of caste on risk of child death between age of 0 and 59 months. All children (except twins) born to Hindu women in the

5 years preceding the survey are included in the analysis. Our analysis is limited to children born in rural areas (73 percent of the sample resided in rural areas at the time of survey). We do so because the presence of health facilities in the community was not recorded for urban areas. The discreet-time hazard method is appropriate as it, like other hazard-based approaches, allows modeling of censored data (children alive at the time of the interview were right-censored). We use five age intervals: 0, 1-5, 6-11, 12-23, and 24-59 months. The chosen age intervals conform to established conventions and assure that there are enough cases in each of them. The corresponding hazard is specified as a series of four dummy variables; these variables also account for unequal interval lengths. Each child contributes a minimum of 1 to a maximum of 5 observations depending on the age of the child at death or censoring.

Our analysis also takes into account the hierarchical nature of the data. In NFHS-2 each state was stratified by districts; primary sampling units (PSUs) were clustered within districts and respondents were clustered within PSUs. Respondents in same PSU and PSUs within the same district may therefore share some unobserved characteristics. Failure to account for this would result in smaller standard errors for both community-level and individual-level estimates (Longford 1993; Goldstein 1995). GLIMMIX procedure in SAS 9.1 is used to estimate a random effects models with three levels: individual children (level one), PSUs clustered within districts (level two), and districts (level three). These models will have estimates for random intercept that varies at three levels and a fixed estimate that is common throughout India. There were 2140 PSUs clustered within 410 districts. Appropriate sample weights, provided in the data set, were applied to adjust for oversampling and non-response.

In accordance with the existing literature on child mortality, we control for mother's education (Ghuman, 2003; Desai & Alva, 1998; Muhuri, 1995; Tulasidhar, 1993), individual economic status (Wagstaff, 2000; Pandey et al., 1998), sex of the child (Mishra et al., 2004; Arnold et al.,

1998; Kishor, 1993); birth interval (Ghosh, 2003; Whitworth & Stephenson, 2002; Nath et al., 2000; Nath et al., 1993), age of the mother (Adhikari, 2003; Alam, 2000; Hobcraft et al., 1985), community economic status (Kravdal, 2004), and presence of health facility in the community (Navaneetham & Dharmalingam, 2002; Sastry, 1996). Table 1 provides the description of the variables used in our analysis.

Table 1 about here

Results

Charting changes in child mortality over time

We first examine caste-specific trends in neonatal (0-28 days), post-neonatal(1-12 months), infant (0-12 months), child (13-59 months), and under-five (0-59 months) mortality for two five-year periods preceding the NFHS-2. These trends are presented in Table 2. All the indicators of mortality declined for the three caste groups between 1989–93 and 1994–98 periods, in accordance with overall decline in mortality rates in India. Under-five mortality rates during the 1994–99 period for SC/ST, OBC, and FC were 119, 97, and 76, respectively.

Table 2 about here

Table 3 about here

Of central importance to our analysis are rate ratios and absolute changes in rates, which are presented in Table 3. Overall, in the 1994-98 period, SC/ST had a rate of infant mortality 1.4 times that of FC and OBC had a rate of infant mortality 1.3 times that of FC. For under-five mortality the rate difference is 1.6 and 1.3 respectively. A comparison of the infant and under-five mortality rates of 1989-93 and 1994-98 shows that the mortality gap among the groups was widening. The gap in under-five mortality rates between SC/ST and FC increased from 1.4 to 1.6. The largest change in mortality rates between the two periods occurred for FC: the infant mortality rate decreased by nearly 15, while the lowest change was experienced by SC/ST: a

decrease of 10. The unequal decline in absolute infant mortality rates could be possibly due to the better ability of the dominant group to capitalize on their social capital and networks in getting access to medical knowledge and technology that reduce mortality. However, it could also be that improvements in socioeconomic conditions of FC were far greater than that of SC/ST.

Descriptive statistics by caste appears in Table 4. This distribution mirrors the caste hierarchy, with SC/ST women at the bottom and FC women at the top. Thus among SC/ST women, two-thirds had no education, 60 per cent had a low standard of living, 36 per cent resided in villages where the nearest health center was farther than 3 kilometers, and a similar per cent lived in poor districts. In comparison, nearly 40 per cent of OBC women had a low standard of living and 64 per cent of them have no education. About 23 per cent of FC women lived in rich neighborhoods, 41 per cent in villages with health care facilities, and about 20 per cent of them had high standard of living. Among FC women, 34 per cent had a higher or secondary education. Besides the expected higher individual social and economic position occupied by FC women, we also find that more FC women than SC/ST or OBC women live in communities with higher economic status and many of them lived in villages that had a health facility within the village.

Table 4 about here

Below, we will use multivariate analysis to examine whether mortality differentials detected among the caste groups are explained by these differences.

The social disadvantages suffered by girls in the Indian context and the resulting higher rates of malnutrition and death among them have been well documented (Bhat & Zavier, 2003; Kishor, 1993). In analyzing the caste-sex relationship in mortality, we find that girls have lower survival

rates than boys in all the three groups. The survival rates for boys at 59 months were 0.885, 0.907, 0.927 for SC/ST, OBC, and FC, respectively, whereas the corresponding survival rates for girls were 0.871, 0.888, and 0.910. The ratio of female-to-male survival estimates suggests that female child belonging to OBC faces the greatest disadvantage, while female child belonging to FC and SC/ST share a similar disadvantage. Though the lower level of disadvantage faced by SC/ST girls does not come as a surprise (this has been primarily attributed to less patriarchal form of social organization, see Maharatna, 2005:132–188), the low risk faced by FC girls is quite surprising because FC exhibit large imbalance in female sex ratio. One possibility is that among FC there may be a shift from female child discrimination after birth to sex-selective abortions (see Sen, 2003, for discussion on increasing sex-selective abortions).

The survival function estimates by caste are depicted in Figure 1 (the survival function estimates were estimated at 0, 5, 11, 23, 59 months). A marked difference in survival chances between FC and others two caste groups appears by age of five months; the difference between OBC and SC/ST starts growing near the end of first year of life and increases further since the end of the second year.

Figure 1 about here

Multivariate results

Table 5 presents the odds ratios for predictors of child death. Model 1 is a baseline model that includes only caste and month since birth as covariates. In this model the odds of death of a SC/ST child and an OBC child are 44 and 27 per cent higher, respectively, than those of FC, with both differences being statistically significant. In Model 2, a set of individual-level socioeconomic and demographic factors are included to test if the caste mortality differentials can be explained by these factors. The inclusion of these factors reduces the differences between FC and SC/ST and between FC and OBC, but both differences remain statistically

significant. This results shows that socioeconomic and demographic factors do not fully explain the child mortality differentials. In model 3, district-level covariates are added. Their addition causes a negligible decrease in the odds of child death for OBC compared to FC and no change in corresponding odds ratio for SC/ST, demonstrating that caste mortality differentials are impervious to the selected community characteristics.

Table 5 about here

The persistence of the significant effect of caste as seen in the three models presented in Table 5 lends empirical support to our hypothesis that caste has an independent effect on child mortality and the differential cannot be accounted by individual- and community-level factors. This finding is consistent with micro-level studies in India (Kabir, 2003; Zachariah & Patel, 1983;Talukdar, 1983) and also with the literature from sub-Saharan Africa, Nepal and US that have shown racial and ethnic differences in child mortality to persist beyond socioeconomic factors (Frisbie et al., 2004; Suwal, 2001; Brockerhoff & Hewett, 2000). When we examined the mortality difference between SC/ST and OBC, we find that, net of individual and community controls, there is no significant difference in odds of death between these two groups (results not shown). This suggests socioeconomic conditions may play a more important role in the difference between SC/ST and OBC than between FC and low castes.

In the next step, we examine the data for possible interactions to which our preliminary explorations and other research allude. However, we find no significant interactions between caste, on the one hand, and child's sex, child's age, and mother's education on the other (not shown). We also examine if the proportion of low castes members in the district has an effect on child mortality. However, no such effect was found. At the district level, we detect a variation in caste mortality differences by district economic status. The odds ratios for the effect of caste by

district economic status are graphically presented in Figure 2. Low castes have significantly higher odds of death than FC (35 per cent for SC/ST and 32 per cent for OBC) in poorer districts. In medium-wealth districts the pattern is similar but much more subdued and statistically non-significant. In rich districts, OBC actually display lower odds of child death that FC but the differences are not statistically significant. It can be recalled from Table 5 that living in poor districts had no overall net effect on risk of death; the breakdown of the sample by the district socioeconomic status refines the picture, as the effect of living in poor districts on health is not same for all three caste groups. The marked disadvantages of living in a poor area for lower castes suggest that members of high castes are better able to mitigate the deleterious effects of the poverty environment. It is possible that, rather than being a mediator, economic status of the community may be related with caste composition – that is a person of low caste is relatively likely to live in an area where many others are also of low caste, which in turn may influence the community economic status.

Figure 2 about here

Caste differentials in access to antenatal and delivery care

In this section, we investigate the relationship between caste and major proximate determinants of child survival: antenatal care and delivery care. The most direct way of reducing child mortality is by improving access to health care facilities and by encouraging utilization of those facilities. Research in India and other developing countries has shown wide disparities in the availability of health care resources and quality of care received (Heck et al., 2002; Thaddeus & Maine, 1994) as well as differences in utilization of health services due to cultural reasons (Matthews et al., 2005; Bloom et al., 2001) and costs of care (Shariff & Singh 2002; Nahar & Costello 1998).

The coverage of antenatal check-ups and institutional delivery remains low in India: at the turn of the century, 65 per cent of pregnant women were receiving some antenatal care, 30 per cent were receiving the four check-ups recommended by the WHO, and 35 per cent of women were giving birth in a health facility (International Institute for Population Sciences (IIPS) & ORC Macro, 2000). It has been noted that those receiving antenatal care are also more likely to deliver at a health facility and infant mortality of children born at home is about one-third higher than those born in a public health facility (Govindasamy & Ramesh, 1997). Along with socioeconomic factors that are strongly associated with antenatal care (Stephenson & Tsui, 2002), cultural notions about pregnancy as a condition not requiring medical care and attention (Sugathan et al., 2001) have been identified as significant predictors of using antenatal care.

To test the effect of caste on antenatal and delivery care at the national level and propose possible explanations for such differences we analyze data for the last child born in the three years preceding the survey (as health care measures were collected only for the last child). The definition of the two outcomes is included in Table 1.

In Table 6, we present the odds ratios of getting antenatal care and delivery assistance, controlling for standard of living, education, district economic status, and distance to health center. The results indicate that caste differentials exist at the national level. SC/ST are at a particularly big disadvantage in use of antenatal care compared to FC, but the gap between OBS and FC is also large and statistically significant. The odds of getting antenatal care were 30 per cent lower for SC/ST and 24 per cent lower for OBC compared to FC. While the differences between FC and the two lower caste groups are considerable, the differences between SC/ST and OBC are quite small and not significant. A similar, albeit smaller, disadvantage of lower castes exists in having received delivery assistance, with SC/ST and OBC women having 21 and 9 per cent smaller odds, respectively, of having received any health

assistance during the delivery of their child birth. This caste disparity in health care use is consistent with micro-level and regional studies that have noted a similar trend (; Pallikadavath et al., 2004; Matthews & Gubhaju, 2004; Mondal, 1997;)

Navaneetham and Dharmalingam (2002, p.1867) suggest that caste differentials in antenatal care could be a "result of residential segregation and availability of health care services" or "relative under-utilization of maternal health care services among the scheduled caste and scheduled tribe communities." The continued significance of caste indicator after controlling for distance to health facility indicates that barriers to utilizing health services play a vital role. As noted earlier, notions about pregnancy as not requiring medical care may impede health care utilization. But discrimination of health care providers may also play a role. Thus a study by Mondal (1997) found that home visits by health workers was confined to forward caste households and suggested "prejudiced attitudes" as a possible reason. Our data do not allow us to investigate the matter any further.

Conclusion

The strides made by the successive Indian governments in protecting the low castes from discrimination and improving their social and economic conditions are extraordinary. Despite these strides, members of low castes suffer disadvantages in various spheres of life including health. The interpretations of caste disparity, though widely acknowledged, have tended to focus on class instead of caste per se: the caste differentials have been said explained to arise out of class differential. Our analysis has shown that caste differentials in health outcomes such as child mortality cannot be reduced to socioeconomic differences among castes. However, this should not be taken as denying the importance of socioeconomic factors for child survival and the connections between those factors and caste. Indeed, our analysis shows the dampening of the caste effects when socioeconomic status is included in the analysis. Any

one-dimensional characterization of caste would be misleading. As our analysis demonstrates, to better understand the inequities in health it is necessary to conceive caste and class as both independent and related.

This study provides insights into the complex relationship between caste and child mortality. While the mortality differentials between FC and other caste groups persist, the difference between SC/ST and OBC does not. The caste hierarchy, at least in terms of child mortality differentials, appears to be more of a dichotomy separating FC from other castes. This does not mean that there are no differences between SC/ST and OBC, but rather that they can be explained by differences in social and economic positions occupied by these groups. In terms of policy, this finding points to the need to pay due attention to both socioeconomic conditions of the low castes and the political and cultural factors that seem to be more influential in shaping the gap between FC and the low castes.

In countries of generalized high poverty and high child mortality, significant within-country differences are often blurred and research and policy efforts are often oblivious to or unconcerned with pervasive and persistent group inequities rooted in factors other than income and wealth. As Brockerhoff and Hewett (2000:38) note in their study of ethnic differentials in child mortality in Africa, “disparities within countries question the validity of targets for national mortality reduction, and of uniform methods to achieve such reduction” and further add “countries should pay special attention to the disadvantaged ethnic groups and the areas where they are concentrated, and develop strategies for optimal success of these efforts”. Similarly, our findings suggest that successful child mortality reduction policies in India should pay special attention to lower castes, striving specifically to increase their access to and utilization to antenatal and child delivery care. These policies should target poorer districts in particular

because it is in poorer districts where the caste differentials in mortality are particularly pronounced.

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Table 1: Description of variables used in the analysis

Variables	Description
Sex of the child	Whether the child is male or female
Month	Age of the child in months(categorized as 1= 0 months; 2 = 1 to 5 months; 3=6 to 11 months; 4 =12 to 23 months; 5 = 24 to 59 months)
Birth interval	Number of months between current and previous birth (1 = less than 24 months; 2 = greater than 24 months; 3 = first birth)
Mother's education	Highest level of education the women attained (1 = secondary or higher education; 2= primary education; 3= no education)
Mother's age at child birth	Respondent's age in years at child birth
Standard of living index (SLI)	Index provided with the dataset is used. The index was constructed from the household ownership of possessions/consumer durables and land/livestock. The index scores ranged from a value of 0 to 66. This was categorized into 3 levels: low = index scores of 0–14; medium = 15–24; high = 25–66 (for details see (International Institute for Population Sciences (IIPS) and ORC Macro 2000).
Health center	Classified into three categories: presence of health center in the village, presence of health center within 3 km of the village, and distance to health center greater than 3 km.
District-level economic status	Classified based on number of poor households (i.e. with low standard of living index) in the district. District with less than 20% households poor are classified as rich district; 21% to 40% poor household as medium district; over 40 % of poor households as poor districts.
Antenatal care	Prenatal care is coded 1 if the mother had a prenatal check from at least one of the following persons: doctor, nurse/midwife, health professional, or home health worker. If the mother did not have a visit from any of the above then prenatal is coded 0.
Delivery assistance	Deliveries assisted by either doctor, nurse/midwife or health professional are categorized as 1; if no assistance then categorized as 0.

Table 2: Neonatal, post-neonatal, infant, child and under-five mortality rates for 0-4 and 5-9 years preceding the survey by caste, India NFHS-2, 1998-99

	5-9 years preceding survey (1989-93)			0-4 years preceding survey (1994-98)		
	Scheduled Caste/Tribe	Other Backward Caste	Forward Caste	Scheduled Caste/Tribe	Other Backward Caste	Forward Caste
Neonatal Mortality	58.0	57.8	48.1	51.1	46.2	37.8
Post-neonatal Mortality	32.6	26.1	24.3	29.2	25.6	19.1
Infant mortality	90.6	83.9	72.4	80.3	71.8	56.9
Child mortality	44.6	33.2	23.2	42.4	27.1	20.3
Under-five mortality	131.2	114.3	93.9	119.3	96.9	76.1

Table 3: Infant and under-five mortality rate ratios and absolute changes in rates, India NFHS-2, 1998-99

	Rate ratios with forward caste				Absolute change in rates (1999-95 & 1990-94)	
	5-9 yrs preceding the survey		0-4 yrs preceding the survey			
	IMR	Under-five rate	IMR	Under-five rate	IMR	Under-five rate
Scheduled Caste/Tribe	1.3	1.4	1.4	1.6	-10.3	-11.9
Other Backward Caste	1.2	1.2	1.3	1.3	-12.1	-17.3
Forward Caste	-	-	-	-	-15.5	-17.8

Table 4: Descriptive statistics by caste, India NFHS-2, 1998-99

	All castes	Scheduled Caste/Tribe	Other Backward Caste	Forward Caste
Sex of the child, %				
Male	51.91	51.72	51.90	52.18
Female	48.09	48.28	48.10	47.82
Mother's education, %				
Secondary or Higher	21.06	11.38	20.87	33.98
Primary	15.08	11.70	14.99	19.61
No education	63.86	76.92	64.14	46.41
Standard of living index, %				
High	10.04	3.37	9.48	19.59
Medium	46.41	37.04	50.49	53.38
Low	43.55	59.60	40.03	27.02
Mean age of mother at child birth	23.66	23.65	23.68	23.64
District-level economic status, %				
Rich	17.07	15.80	13.72	23.14
Medium	50.58	47.67	53.65	50.38
Poor	32.34	36.53	32.63	26.48
Health center, %				
In the village	38.28	35.53	38.90	41.08
Within 3 Km	28.71	28.07	28.31	30.08
Greater than 3 Km	33.01	36.40	32.79	28.84
Child alive, %				
Yes	91.64	90.53	91.55	93.22
No	8.36	9.47	8.45	6.78
N	35209	12725	12760	9724

Table 5: Odds ratios (with standard errors) of the relationship between caste and child death

	Model 1	Model 2	Model 3
Caste			
Scheduled Caste/Tribe	1.44 *	1.14 *	1.14 *
	(0.053)	(0.057)	(0.057)
Other Backward Caste	1.27 *	1.12 *	1.11 *
	(0.055)	(0.056)	(0.057)
(Forward Caste)	1	1	1
Sex of the child			
Male		0.91 *	0.91 *
		(0.038)	(0.038)
(Female)		1	1
Month			
0	3.63 *	3.78 *	3.75 *
	(0.069)	(0.070)	(0.070)
1 to 5	1.13	1.17 *	1.17 +
	(0.079)	(0.080)	(0.080)
6 to 11	0.97	0.99	0.97
	(0.084)	(0.084)	(0.085)
12 to 23	0.88	0.90	0.90
	(0.088)	(0.088)	(0.089)
(24 to 59)	1	1	1
Birth interval			
Less than 24 months		1.42 *	1.40 *
		(0.054)	(0.055)
Greater than 24 months		0.64 *	0.64 *
		(0.059)	(0.060)
(First birth)		1	1
Mother's education			
Secondary or Higher		0.55 *	0.56 *
		(0.069)	(0.069)
Primary		0.84 *	0.86 *
		(0.059)	(0.059)
(No education)		1	1
Index of standard of living			
High		0.57 *	0.58 *
		(0.097)	(0.099)
Medium		0.84 *	0.83 *
		(0.043)	(0.044)
(Low)		1	1
Mother's age at child birth		0.84 *	0.84 *
		(0.023)	(0.023)
Mother's age squared		1 *	1 *
		(0.00)	(0.00)
District-level economic status			
Rich			0.97
			(0.087)
Medium			1.03
			(0.068)
(Poor)			1
Health center			
In the village			0.86 *
			(0.056)
Within 3 Km			0.88 *
			(0.060)
(Greater than 3 Km)			1
Random Effects Estimates			
District level	0.13	0.10	0.11
	(0.026)	(0.023)	(0.024)
PSU level	0.21	0.17	0.16
	(0.029)	(0.027)	(0.027)

* p < 0.05; + p < 0.10
() reference category

Table 6: Odds ratios (with standard errors) of antenatal care and delivery assistance by caste

	Antenatal care	Delivery assistance
Caste		
Scheduled Caste/Tribe	0.70 *	0.79 *
	(0.052)	(0.050)
Other Backward Caste	0.76 *	0.91 *
	(0.051)	(0.049)
(Forward Caste)	1	1
Mother's education		
Secondary or Higher	4.12 *	3.58 *
	(0.058)	(0.048)
Primary	1.86 *	1.85 *
	(0.052)	(0.048)
(No education)	1	1
Standard of living index		
High	2.51 *	2.68 *
	(0.077)	(0.066)
Medium	1.48 *	1.47 *
	(0.040)	(0.040)
(Low)	1	1
District-level economic status		
Rich	0.90	1.46 *
	(0.238)	(0.165)
Medium	1.09	1.43 *
	(0.217)	(0.149)
(Poor)	1	1
Health center		
In the village	1.52 *	1.97 *
	(0.079)	(0.079)
Within 3 Km	1.35 *	1.39 *
	(0.083)	(0.084)
(Greater than 3 Km)	1	1
Random Effects Estimates		
District level	2.64	1.03
	(0.239)	(0.113)
PSU level	0.79	0.93
	(0.054)	(0.059)

* $p < 0.05$.

() reference category

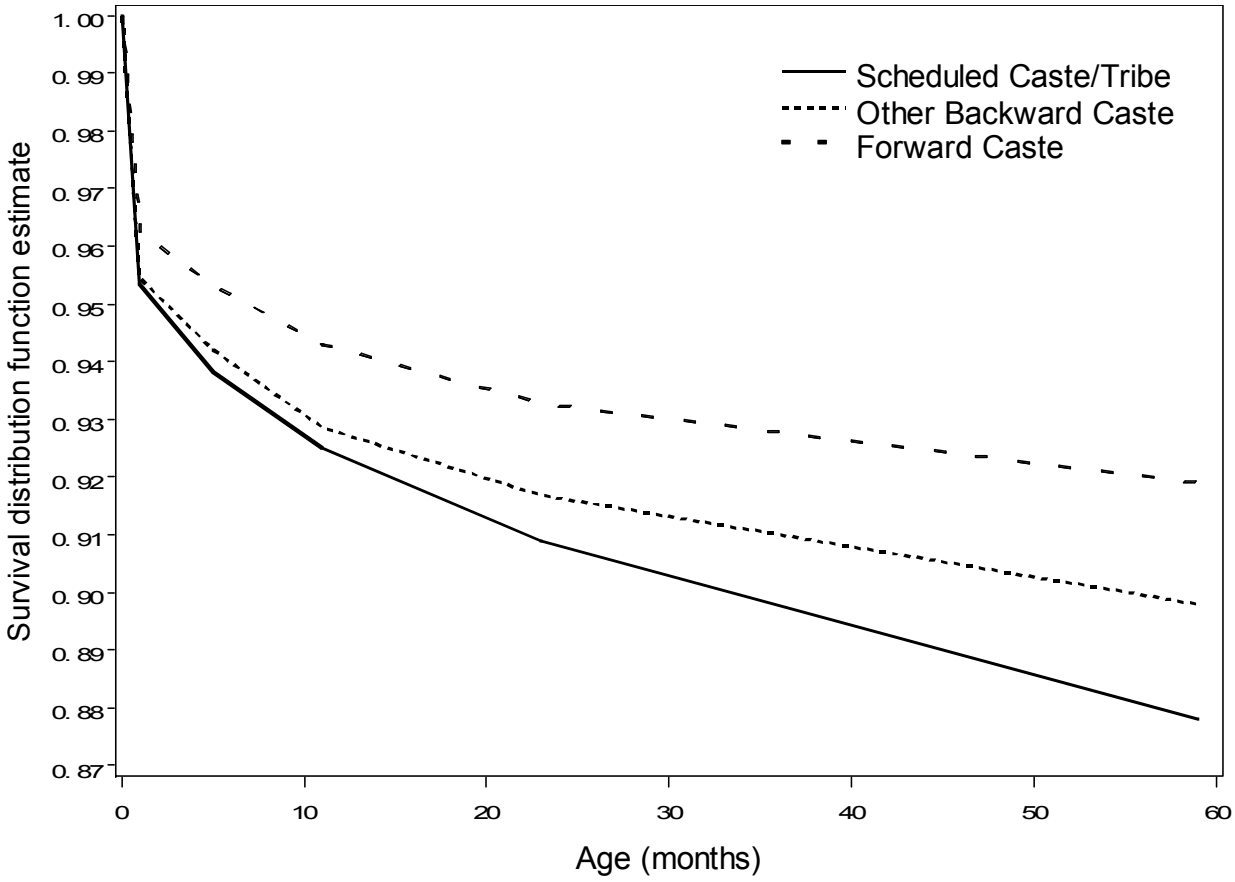
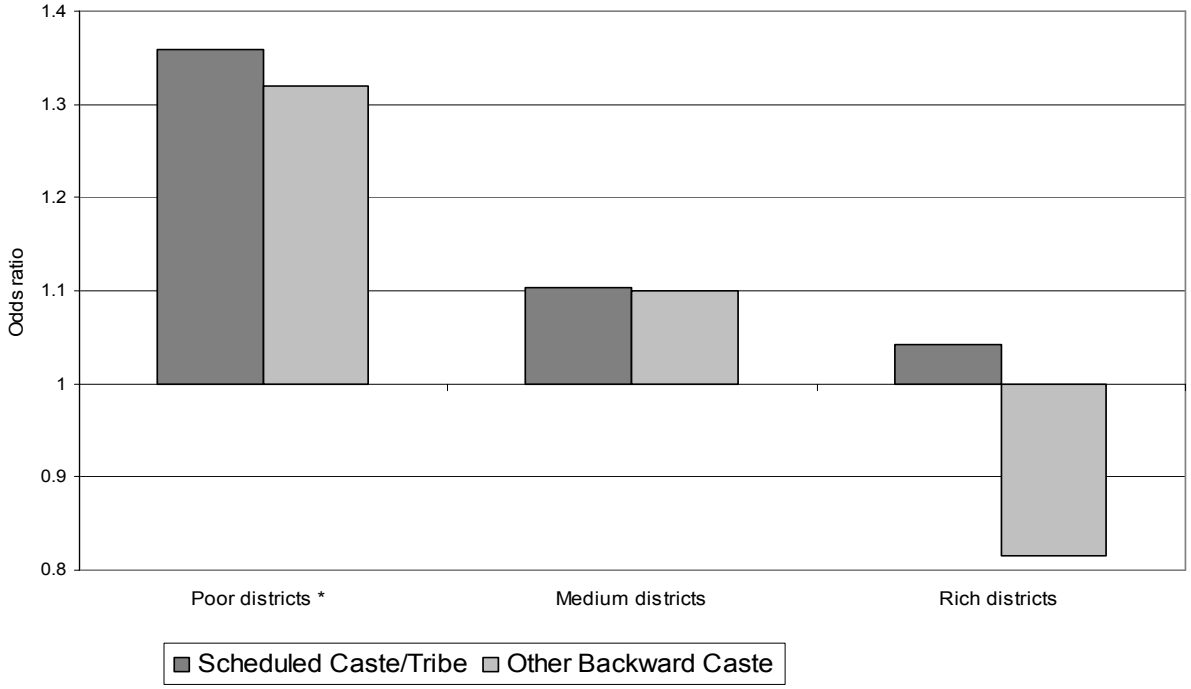


Figure 1: Child survival estimates by caste



* p < 0.05

Figure 2: Caste differences in odds of child death by district economic status (Forward Caste as reference category)