Does Religious Identity Matter for Child Health?
Sex Differentials in Child Health among Hindus and Muslims in India

Extended Abstract for PAA 2014

Abhijit Visaria
Population Studies Center, University of Pennsylvania

Abstract

This paper examines if and to what extent do sex differentials in children's immunization and nutritional status exist within and differ between children from Hindu and Muslim families in India, the two largest religious groups in India together constituting about 94% of the total population. The study uses data from the three rounds of the nationally-representative National Health and Family Surveys and employs multilevel modeling to estimate to what extent sex differentials in child health are associated with individual-level maternal characteristics such as employment, autonomy and healthcare utilization, and by contextual-level characteristics such as religious homogeneity of the community, economic status, and availability of health resources. The study will thus be able to assess if differences in India between Hindus and Muslims in child health sex differentials relate to these factors or to underlying differences between the two communities such as sex preference for male or female children.

Background

One of the most widely known features of Indian demography is that female child mortality is far in excess of male child mortality (Miller 1981; Kishore 1993; International Institute of Population Sciences 1995; Das Gupta and Bhat 1997). Excess female child mortality also reflects in skewed child sex ratios, with trends suggesting an increasing 'masculinization' from 102 boys per 100 females in 1961, 103.9 boys per 100 girls in 1981, 107.2 in 2001 and 109.4 in 2011 (Registrar General of India, 2012). The Census of 2001, which for the first time reported the age distribution of the population by religion, showed that the child sex ratio among Muslims was less skewed than the general population, with 101.4 boys per 100 girls (Banthia 2004), suggesting that discrimination of girls among Muslim households is relatively less compared to the general population. An interesting finding within this area is that Muslims in India have lower levels of child mortality compared to Hindus, a paradoxical finding since social class variables such as education and income which are negatively associated with mortality are generally found be lower among Muslims in India than among Hindus. The possible explanations for this Muslim mortality advantage which have been examined in the literature include the relatively greater urban patterns of residence for Muslims and therefore better access to health facilities than Hindus (Bhat and Zavier 2005), a minority group status hypothesis which suggests that the relative isolation of Muslims may have generated tight social networks which grant Muslims a health advantage (Basu et al 2007), and closer kinship ties as well as healthier behaviors among Muslims (Bhalotra et al 2010). Bhat and Zavier (2005) and Bhalotra et al (2010) also examine whether lower levels of son preference among Muslims can explain lower female mortality compared to Hindus but do not find conclusive evidence for this. Guillot and Allendorf (2010) undertake a more detailed study of the son preference hypothesis examining in particular sex differentials in mortality among Hindus and Muslims but find that these are relatively similar among the two groups and do not fully explain the Muslim child mortality advantage in India. The authors however do find that discrimination against girls is lower among Muslims than among Hindus whenever the family already has boys or in the case of first births. However, there is greater discrimination against girls among Muslims whenever the family already has girls. The authors also find that urban residence does grant Muslim households an advantage by lowering the probability of child mortality, and that this effect is due to access to piped drinking water within the residence and to sanitation services. While Muslims are more likely overall to be urban residents, Muslim residents in rural areas are more likely to live in homes with toilets and improved water sources.

One further paradox in Hindu-Muslim demographic data that has received lesser attention is that even though Muslims have a mortality advantage at the age of five compared to Hindus, they are significantly worse off than most other groups in terms of children under the age of five being stunted and underweight. Comparing Muslims with Hindus disaggregated into forward/higher castes and scheduled castes, Deolalikar (2010) shows from the NFHS 2005-06 data that among all social groups, Muslims suffer from the highest rates of stunting and the second-highest rates of underweight children below the age of 5 years. Pande (2003) also found that children in Muslim households were 39% less likely compared to those in Hindu households to be fully immunized and 13% more

likely to be severely stunted. However since religious differences were not a focus of the study, the author does not include interactions between religion and either gender or parity. Given the importance of parity and sex composition of existing sibling as demonstrated by Guillot and Allendorf (2010) as well as Pande (2003), I propose to account for these factors in studying sex differentials in child outcomes. In contrast to child mortality, these findings related to child health outcomes are more in line with what might expect Muslims with overall poorer socioeconomic status to have. Bhalotra et al (2010) posit that the religious differences in nutritional status are lower than the differences in mortality and that this may be further evidence of greater son preference among Hindus. A step towards understanding this health-mortality paradox better may be to conduct a deeper examination of the patterns displayed by the two groups, and in particular to compare and contrast sex differentials in child health outcomes. Could the overall Hindu advantage in child health be explained by a significantly greater male advantage over females among Hindus than among Muslims? After accounting for other known differences between Hindus and Muslims which may affect child health outcomes, such a finding would support the hypothesis that greater female discrimination persists among Hindus and suggest that son preference may indeed be greater among Hindus compared to Muslims.

Data and Methods

The data for this analysis comes from the three waves of the nationally-representative National Family and Health Surveys in India, conducted in 1992-93 (NFHS-1), 1998-99 (NFHS-2), and 2005-06 (NFHS-3). The NFHS's are repeated cross-sectional surveys conducted along the lines of the Demographic and Health Surveys, and include a nationally representative sample of women aged 15-49 (aged 13-49 in case of NFHS-1, and ever-married in NFHS-1 and NFHS-2) across India. Anthropometric data pertaining to children was collected for children born to the respondent women in the five years preceding the year of the survey in NFHS-1, in the preceding four years in NFHS-2, and for all children born in the five years preceding the survey in the household and not just children of the female respondent in NFHS-3. The analytical sample for this study thus consists of a total sample of 91,712 children (who are Hindu or Muslim) across the three NFHS waves.

This paper will employ multilevel models to be able to account for the effect of the religious population distribution within a community on determinants of child health. In India, disadvantaged groups are found to reside in relatively homogenous neighborhoods – for instance, along the lines of religion or scheduled caste and tribes in rural India, and especially for Muslims in urban India. Muslim populations are relatively concentrated geographically (Kulkarni 2010) and increasingly dense concentrations of Muslim locations have been seen in urban areas especially following periods of communal strife and unrest. Various authors have indicated that the geographic concentration of Muslims and their community socioeconomic status are important factors that influence their demographic behaviors (Dharmalingam and Morgan 2004; Bhat and Zavier 2005; Bose 2005). To the extent that Muslim households on average have lower levels of male and female educational attainment, lower female employment and household wealth

compared to Hindus, and these in turn determine neighborhood resources, it is possible that a majority of Muslims live in disadvantaged neighborhoods from the perspective of access to health and nutritional resources. On the other hand, social networks may be stronger in areas with greater homogenous concentrations, leading to more dense learning networks in which social and cultural environments inform and influence behaviors (Kohler 1997). A multilevel modeling approach is therefore proposed which allows the simultaneous estimation of individual/household or level 1 characteristics and community/PSU or level 2 characteristics. This model specification will help ascertain if and to what extent are sex differentials in child health outcomes influenced by individual-level characteristics such as employment, autonomy and healthcare utilization, and by contextual-level characteristics such as religious heterogeneity/homogeneity of the community (measured by the proportion of population belonging to a particular religion), economic status, and availability of health resources.

Dependent Variable: Childhood Immunization

Childhood immunization is an important indicator of childhood health, in particularly as a marker of healthcare utilization. Children are expected to receive their vaccines at four specific times in the first year: at birth, 3 months, 6 months, and 12 months of age. Unlike in the case of treatment of common childhood illnesses, there are no home-based substitutes for vaccines from health service providers. Immunization thus relates to multiple required healthcare visits to a provider during the first year of every child's life. Our operational definition of immunization of children is restricted to children who had completed all three key immunizations: diphtheria-pertussis-tetanus (DPT), measles, and 5acilli Calmette-Guerin (BCG) for tuberculosis. Polio is excluded from this measure given the highly intensive and targeted campaign for polio immunization in India in the past two decades.

Dependent Variables: Height-for-Age, Weight-for-Age, and Weight-for-Height

The nutritional outcomes of interest are height-for-age, weight-for-age, and weight-for-height, where children whose z-scores in these indices is less than 2 standard deviations from the median of the reference population are considered to be malnourished, or to be stunted, underweight and wasting respectively. Height-for-age is an indicator of cumulative nutritional intake and is affected over a period of time by nutrition as well chronic ailments (WHO 1988). On the other hand, weight-for-height is a measure of recent nutritional intake or illness. Thus children identified as being in this category in an anthropometric survey may be due to inadequate nutrition in the recent past or having lost weight due a recent episode of illness. Weight-for-age accounts for both chronic as well as acute ailments.

Preliminary Results

In Table 1, I first examine whether there are any immunization differences between Hindu and Muslim children overall, and find that the odds of being fully immunized are lower for boys as well as girls across all parities in Muslim households compared to their

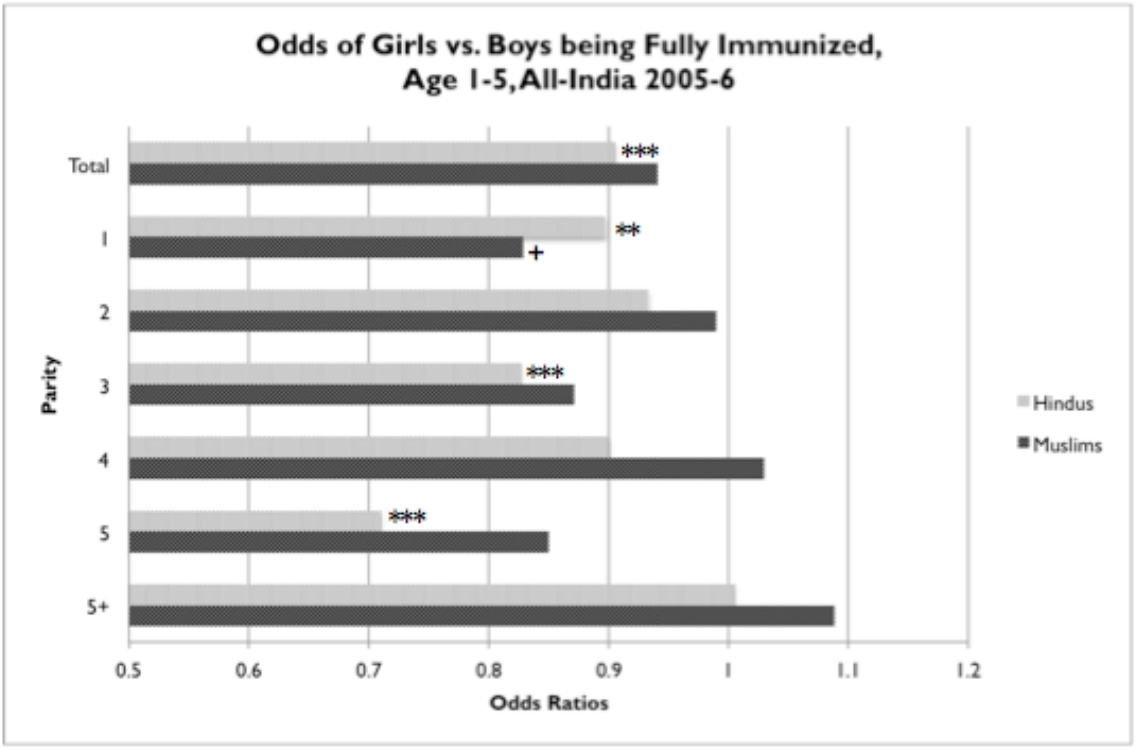
Hindu counterparts. Figure 1 shows results from bivariate analysis of children's immunization status from the 2005-06 National Family and Health Survey-3 data. We see that statistically significant sex differentials in immunization exist only for Hindus, with all girls and especially girls at parities of 1, 3 and 5 having significantly lower odds of being fully immunized than boys. On the other hand, girls in Muslim households are not worse off compared to boys in Muslim households, even though as we saw earlier Muslims boys and girls are worse off compared to Hindus overall. Table 3 presents the odds of girls in the age group of 0-5 years being underweight compared to boys, separately for Hindus and Muslims, and once again we find sex differentials – a female disadvantage – among Hindus but not within Muslim children. These results suggest that it would be of interest to examine in greater detail the source of these differences between Hindus and Muslims in child health sex differentials.

Table 1: Odds of Muslims in age-group of 1-5 years being fully immunized, compared to Hindus, India, 2005-06

	Males			Females		
Parity	OR		N	OR		N
Total	0.5687	***	15822	0.5906	***	14181
1	0.6115	***	4832	0.5645	***	4614
2	0.6232	***	4603	0.6609	***	4016
3	0.6715	***	2669	0.7067	***	2266
4	0.6656	***	1580	0.7611	**	1353
5	0.7034	**	906	0.8419		857
5+	0.8715		1232	0.9438		1075

Source: National Family and Health Survey, 2005-06.
*** p <0.01 ** p <0.05 + p <0.1
Note: Immunizations include BCG, measles, and three doses of DPT.

Figure 1



Source: National Family and Health Survey, 2005-06.
*** p <0.01 ** p <0.05 + p <0.1
Note: Immunizations include BCG, measles, and three doses of DPT. Odds ratios of less than 1.0 indicate lower odds of girls being fully immunized, compared to boys.

Table 2: Odds of females in age-group of 0-5 years being underweight, compared to males, 2005-06

	Hindus			Muslims	
Parity	Odds Ratio		N	OR	N
Total	1.0608	**	30019	1.0108	7211
1	1.0239		10034	0.9914	1820
2	1.0378		8946	1.0679	1765
3	1.1147	+	4865	0.9409	1214
4	1.0928		2734	1.0805	871
5	1.3344	***	1587	0.9517	569
5+	1.0789		1853	1.0509	972

Source: National Family and Health Survey, 2005-06.
*** p <0.01 ** p <0.05 + p <0.1
Note: Underweight is weight-for-age <2 SDs from median weight of 2005 WHO Reference Population.