Gender Differences in Child Survival in India:

What do we Know?

Sonalde Desai, Sonya Rastogi and Reeve Vanneman
Department of Sociology
University of Maryland
College Park MD 20742-1315
sdesai@socy.umd.edu

Abstract:

Even as mortality is declining and economic growth is accelerating, juvenile sex ratio in India has become more and more unfavorable towards girls. Research has focused on a number of predictors of excess female child mortality including poverty, family size, education, women's education, employment and empowerment. However, empirical research consists of a patchwork of often contradictory findings. Results at micro level are often not supported by macro level observations and vice-versa. This paper examines the individual and community level influences on gender differences in infant and child survival in India using data 1998-99 National Family Health Survey which interviewed 89,199 ever-married women. Infant and child survival for 108,002 children born during the past 10 years is examined using hierarchical linear models.

Introduction:

In spite of the well known biological advantage enjoyed by women, India remains one amongst a handful of countries where females outnumber males. Much of this disparity can be attributed to higher child mortality faced by Indian girls as compared to boys. While this fact is well documented in the literature (Miller 1981; Bardhan 1974; Rosenzweig and Schultz 1982), what is even more surprising is that the disparity has widened even as India has experienced record growth rates and a steady decline in poverty. Table 1 documents the juvenile sex ratio for 0-6 year olds. This ratio, which is slightly over 1000 for most countries, has steadily fallen below 1000 in India indicating a widening disparity between girls and boys.

Table 1: Juvenile Sex Ratio for India, 1996-2001

Year	Female/Male Ratio (0-6 year old)
1961	976
1971	964

1981	962
1991	945
2001	927

Determinants of Gender Inequality in Child Health:

While considerable attention has been directed to this issue and a number of studies have been directed to this topic, the research in this area has been piecemeal and the results are often contradictory. While most researchers agree that a strong preference for sons over daughters underlies this phenomenon, there is little agreement on the major causes underlying these preferences. Consider the following:

1. **Poverty**: Since males are more economically valuable in Indian society than females, it seems reasonable to assume that poor parents faced with many demands on their meager resources may prefer to invest these resources in sons by providing them with better food and health care. However, there seems to be little correlation between poverty and gender disparities in health and mortality. While the four large and poor Indian states, Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh (famously dubbed BIMARU – killers of women -- by Ashish Bose, a noted Indian demographer) have always shown poor sex ratios, wealthy states of Punjab, Haryana and Delhi have now joined this group. Moreover, sex ratio in India has worsened even as India has experienced considerable economic growth and poverty rates have fallen from nearly 50% to under 30%. Providing more support for these observations at the macro level, Kishor (1993) finds that in more developed districts, survival chances of girls are reduced. Similarly, Murthi et. al. (1995) findings suggest that districts with higher levels of poverty decrease female disadvantage in child mortality. Furthermore, at the household level, it appears there is less discrimination of girls in poorer household (Miller 1981, Krishnaji 1987). Literature

from the neighboring Bangladesh suggests that gender discrimination is lower among poorer households than among the richer ones (Muhuri and Preston 1991; D'Souza and Bhuiya 1982; Bairagi 1986)

2. **Education**: It has often been argued that women's education is the key to reducing discrimination against daughters. However, female literacy rate has risen from 15% to 54% even as juvenile sex ratio has fallen. Furthermore, some studies have shown that educated mothers are far more "efficient" in discriminating against their daughters than uneducated mothers (Gupta 1987). Other studies have shown that higher levels of maternal education decreases mortality for both boys and girls, the effect is larger for girls, thus providing evidence that higher levels of maternal education decreases gender differentials in child mortality (Bourne and Walker 1991). On the other hand, there is also evidence that maternal education at the district and household levels is weakly associated with increases in female survival (Rosenzweig and Shultz 1982). At a macro level, in general high female literacy states -- Kerala, Andhra Pradesh, Karnataka and Goa-- each with relatively high female education levels have shown less discrimination towards girls but in the past 20 years, high female literacy has not stopped Delhi and Tamil Nadu from showing increased discrimination against female children.
3. **Women's Employment**: Literature on women's status often argues that women's labor force participation increases women's value to the household resulting in higher investments in female children in spite of a cultural preference for sons (Rosenzweig and Schultz 1982; Miller 1981). However, empirical literature has failed to show a strong direct connection. The indirect relationship, established at a regional rather than individual level, shows that districts characterized by higher female labor force

participation are also characterized by more equitable sex-ratio (Kishor 1993; Murthi, Guio, and Dreze 1995). However, this appears to be more a function of poor health outcomes for all children – including males -- than an improvement in girls' health status (Basu and Basu 1991).

4. **Fertility:** International literature on micro consequences of high fertility argues that in families with large number of children, implicit choices have to be made regarding which children to invest in, and often daughters lose out in favor of sons (Montgomery and Lloyd 1996).This would suggest that high fertility may be one of the causes of discrimination against daughters (Arnold, Choe, and Roy 1998) and would be consistent with Muhuri and Preston's (1991) findings in Bangladesh that girls who already have one or more sisters are more likely to experience child mortality than first born daughters or sons. However, in view of worsening sex ratio even as fertility is declining, (Gupta and Bhat 1997) argue that fertility decline, without a change in son preference, is precisely the trigger that leads to greater discrimination against daughters. As long as families insist on having one or more sons, and fertility declines, one of way of accommodating a preference for boys with lower fertility is to discriminate against girls and either engage in female infanticide or sex selective abortion.
5. **Women's Autonomy and Power**: Sex differentials in mortality are substantially different across different parts of India with southern and northeastern India exhibiting far less discrimination against daughters than northern and central states (Bardhan 1974). One of the predominant explanations for these differences focuses on regional differences in marriage and kinship patterns and consequent differences in women's status across different parts of India (Dyson and Moore 1983). Research on women's status suggests

that an increase in women's autonomy and decision making control leads to higher investments in children overall and daughters in particular (Mason 1995) which should result in reduced sex-differentials in health and mortality. Macro level data indicates that where female autonomy is low, the survival of male children is increased and female child survival is reduced (Kishor 1993). At the same time, direct individual level analysis linking women's status to child mortality has found only a weak link between the two (Ghuman 2003), although this study was based on relatively small sample and given the rarity of child mortality, a larger sample size may be required to adequately study this link.

Individual and Contextual Effects:

As we try to interpret this patchwork of results, one problem area becomes clear. Discrimination against girls is carried out at the household level with households engaging in a variety of practices that diminish girls' health and reduce their survival. These include reduced length of breastfeeding, lower nutritional intake (Bairagi 1986, but see Basu 1989) and lower access to health care (Gupta 1987, Miller 1981). At the same time, a lot of analysis is carried out at a district level or aggregate level, increasing the dangers of ecological fallacy. For example, showing that areas in which women work have lower sex differentials in child mortality is quite different from arguing that women's work leads to lower preference for sons. In fact, it is quite likely to be the case that women may be more likely to work in areas that predominantly agricultural and these same areas may be associated with poor quality health services, increase mortality for both male and female children and reducing the gender gap. Thus, children of both working and non-working mothers may suffer from higher mortality on the one hand and benefit from a lower gender gap on the other.

An error in the other direction is also likely. Since the action takes place at the household level, there may be an excessive reliance on the household as a site of discrimination. However, households are embedded in the society in which they live. Whether the mother is herself in control of the household resources or not, in cultures in which women are valued, fathers will also value their daughters and invest in their health and well-being. Conversely, in areas where mothers' well-being and social status is intricately tied to having sons, mothers may be even more likely to engage in discrimination against girls than fathers.

Using data from the National Family Health Survey-II, a demographic and health survey equivalent for India, this paper addresses the following questions:

1. To what extent are higher female infant and child mortality rates linked to household level poverty, family size and women's empowerment (measured by women's education, labor force participation, control over resources and autonomy of decision making)?
2. Whether these household level effects are independent of the effect of poverty and women's empowerment at the level of the community (district)?

Data and Methodology:

The data for this study come from the National Family Health Survey – II conducted in 1998-99. This is a nationwide survey with a random sample of 89,199 ever-married women aged 15-49. In addition to information in birth history, survival status of children and age at death, this survey also collected information on parental education, employment status, household ownership of land a large number of consumer assets. The unique characteristics of this survey in comparison to its predecessor NFHS-I (1992-93) is its focus on variables measuring women's empowerment, particularly women's role in household decision making, their control over resources and experience of domestic violence.

The current paper focuses on all children born in the past 10 years, giving us a sample of 108,002 children. Of these, 8,144 children died before reaching age 5 and 1,443 children died between age 1 and 5. In general, infant mortality is less preventable than child mortality and hence, we expect gender disparities to be more important for child mortality rather than infant mortality. Indeed this is the case; controlling for household wealth (as indexed by ownership of consumer durables), region, and parental education, female children experience higher mortality at all ages following the neonatal period. Between months 1 and 12, girls are 20% more likely to die than boys, between ages 1 and 5 years, girls are 40% more likely to die than boys.

In our ongoing work, we examine the impact of independent variables of interest, wealth, parental education, family size, mother's work status, and several measures of gender empowerment (control over resources, autonomy of decision making and freedom from sexual abuse) on gender differences in mortality. These effects are examined at both individual and community level using hierarchical linear models (estimated by HLM).

Reference List

Arnold, Fred, Minja Kim Choe, and T. K. Roy. 1998. Son Preference, the Family-Building Process and Child Mortality in India. *Population Studies* 52, no. 3: 301-15.

Bairagi, Radheshyam. 1986. Food Crisis, Nutrition, and Female Children in Rural Bangladesh. *Population and Development Review* 12, no. 2: 307-15.

Bardhan, Pranab K. 1974. On Life and Death Questions. *Economic and Political Weekly.* August 1974.

Basu, Alaka Malwade. 1989. Is Discrimination in Food Really Necessary for Explaining Sex Differentials in Childhood Mortality? *Population Studies: A Journal of Demography* 43, no. 2: 193-210.

Basu, Alaka Malwade, and Kaushik Basu. 1991. Women's Economic Roles and Child Survival: The Case of India. *Health Transition Review* 1: 83-103.

Bourne, Katherine L. and George M. Walker Jr. 1991. The Differential Effect of Mother's Education On Mortality of Boys and Girls in India. *Population Studies* 45, no. 2: 203-219.

D'Souza, Stan, and Abbas Bhuiya. 1982. Socioeconomic Mortality Differentials in a Rural Area of Bangladesh. *Population and Development Review* 8, no. 4: 753-69.

Dyson, Tim, and Mick Moore. 1983. On Kinship Structure, Female Autonomy, and Demographic Behavior in India. *Population and Development Review* 9, no. 1: 35-60.

Ghuman, Sharon. 2003. Women's Autonomy and Child Survival: A Comparison of Muslims and Non-Muslims in Four Asian Countries. *Demography* 40, no. 3: 419-36.

Gupta, Monica Das. 1987. Selective Discrimination against Female Children in Rural Punjab, India. *Population and Development Review* 13, no. 1: 77-100.

Gupta, Monica Das, and P. N. Mari Bhat. 1997. Fertility Decline and Increased Manifestation of Sex Bias in India. *Population Studies* 51, no. 3: 307-15.

Kishor, Sunita. 1993. "May God Give Sons to All": Gender and Child Mortality in India. *American Sociological Review* 58, no. 2: 247-65.

Mason, Karen O. 1995. *Gender and Demographic Change: What do we Know?* Liege: International Union for Scientific Study of Population.

Miller, Barbara. 1981. *The Endangered Sex: Neglect of Female Children in Rural North India*. Ithaca: Cornell University Press.

Montgomery, Mark R., and Cynthia B Lloyd. 1996. Fertility and maternal and child health. Editors Dennis A. Ahlberg, Alan C. Kelley, and Karen Openneheim MasonBerlin: Springer.

Muhuri, Pradip K., and Samuel H. Preston. 1991. Effects of Family Composition on Mortality Differentials by Sex Among Children in Matlab, Bangladesh. *Population and Development Review* 17, no. 3: 415-34.

Murthi, Mamta, Anne-Catherine Guio, and Jean Dreze. 1995. Mortality, Fertility, and Gender Bias in India: A District-Level Analysis. *Population and Development Review* 21, no. 4: 745-82.

Rosenzweig, Mark R., and T. Paul Schultz. 1982. Market Opportunities, Genetic Endowments, and Intrafamily Resource Distribution: Child Survival in Rural India. *The American Economic Review* 72, no. 4: 803-15.