CHAPTER V

GENDER DISCRIMINATION
IN NUTRITION AMONG
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5.1 Introduction

This chapter explores the pattern of gender bias in childhood feeding practices, health care and nutritional status of children under age 5 by birth order and sex composition of older living siblings. The nutritional status of children is measured by the three anthropometric indicators, namely, stunting, underweight and wasting as well as anaemia. According to Marcoux (2002), if detectable differences by sex exist, boys usually fare worse than girls by anthropometric indicators. Sommerfelt et al., (1998) reached a similar conclusion after reviewing the evidence on sex differentials in stunting, underweight, and wasting from 41 Demographic and Health Surveys. A detailed review of literature on the intra-household distribution of food found little evidence of discrimination against girls in feeding (Haddad et al., 1996). In an individual case study, Basu, (1993) drawing on field data from India and a review of literature on household allocation of food in South Asia, where anti-female discrimination is believed to be widespread, found no evidence that girls are discriminated against in feeding. Mishra et al., (1999) analyzed data from a large national survey in India and found that boys and girls were about equally likely to be stunted and underweight, but boys were slightly more likely than girls to be wasted. Schoenbaum et al., (1995) also found no consistent evidence of gender differences in feeding or nutritional status among children age 0–18 months in the Gaza Strip.

This overwhelming evidence of a lack of sex differentials in childhood feeding and nutritional status flies in the face of considerable evidence of strong son preference in
many parts of South and East Asia, the Middle East, and North Africa (Arnold, 2001). Strong preference for sons often manifests itself in the form of discrimination against daughters (Arnold et al., 1998). It is believed to be responsible for many discriminatory practices against girls in feeding, health care, and education (Timaeus et al., 1998; Chen et al., 1981; Muhuri et al., 1991). Son preference has been associated with preferential abortion of female fetuses and even to female infanticide (Arnold et al., 2002; Goodkind, 1996). Two recent studies in India have linked son preference to high sex ratios birth, which indicate sex-selective abortion (Arnold et al., 2002; Retherford et al., 2003). Strong son preference is also believed to be partly responsible for high male/female (M/F) population sex ratios in India (Visaria et al., 1995).

In India, male children are valued higher than are female children, and there are evidences of discrimination in respect of food and health care. As a result, the prevalence of undernutrition is often found higher among girls than among boys (Gupta, 1986; Geetha and Swaminathan, 1996; Gopalan, 1995). According to Rajaretnam et al., (2000) there are sex differentials in nutritional status of children, female children are at a disadvantageous position compared with male children. Mishra et al. (2004) in their study observed that in the case of childhood feeding in India, there is discrimination against girls in breastfeeding. They found clear gender discrimination for stunting and underweight but not for wasting and anaemia. However, there are also evidences that such differences are not well marked (Arokiasamy, 1992). Indeed, the relationship between malnutrition and gender is more complex and is linked to mother’s socio-economic status and sex composition of children (Osmani and Sen, 2003).
From the above background, the analytical approach in this analysis for detecting the effects of gender discrimination is to assess, among children of specified birth order, the effects of index child’s sex and mother’s number of living sons (among her earlier children) on selected indicators of child feeding practices, health care, and nutritional status while controlling for a number of bio-demographic and socio-economic variables that might otherwise confound the relationship. It is also expected that some “substitution effect” in gender discrimination, to the extent that couples in India are practicing sex-selective abortion. As described by Goodkind (1996), gender discrimination in feeding and care may be absent in families that use sex-selective abortion as a tool to attain a desired sex composition of children, so that each child is wanted, regardless of its sex. In India as a whole, however, the prevalence of sex-selective abortion is low, so that this “substitution effect” probably has little influence on the results (Mishra et al., 2004).

5.2 Sex differentials in childhood feeding practices, health care and nutrition

India exhibits wide variations in the degree of son preference, with a stronger son preference found in northern India than in the south (Dyson and Moore, 1983). Children below five years of age constitute approximately 12 percent of India’s population (Census of India, 2001). Rapid growth and development during this period make these children vulnerable to nutritional deficiencies and increased susceptibility to morbidities (Ministry of Human Resource Development, 2002 and Gove, 1997). It has been observed that malnutrition during this phase of life is mostly due to faulty feeding practices rather than lack of resources (Ghosh, 1998 and ICMR Bulletin, 2000). Feeding practices have also been shown to be discriminatory by the sex of the child (Chen et al., 1981; Gupta, 1987; Sen et al., 1983 and Frongillo et al., 1993). Moreover, several studies have shown
that female children receive less food or suffer more from malnutrition (Wyon et al., 1971; Cowan et al., 1983; Pettigrew, 1986; Khan et al., 1989 and Ghosh, 1995). However, the National Family Health Survey indicated some variable evidences where boys and girls are equally likely to be stunted, on underweight, but boys were slightly more likely than girls to be wasted (Mishra et al., 1999). Even in case of similar calorie intake, boys are given more valued foods, such as milk and fats, while girls are given more cereal (Gupta, 1987, 1990). In contrast, a case study using data from selected states shows no evidence of gender bias in the allocation of nutrients to young children aged 0-5 years (Lancaster et al., 2006). Similarly, a case study in a Delhi slum showed that boys received slightly poorer diets than girls as regards some items such as fruits and eggs, even though boys consumed slightly more milk (Basu, 1992).

Studies across India have found that boys are much more likely than girls to be taken to a health facility when sick (Gupta, 1987; Govindasamy et al., 1996; Kishor, 1993). Boys had higher immunization rates than did girls in all except Goa and Karnataka, although the extent of this difference varied by states (Arokiasamy, 2004). Similarly, girls are more likely to be malnourished than boys in both the northern and southern states (Arnold et al., 1992; Sen et al., 1983; Pebley et al., 1991). Cross-sectional surveys of practitioners and care providers reported discriminatory care-seeking for boys and girls in India, (Ganatra et al., 1994; Pandey, 2002). Studying the migrants from Tamil Nadu and Uttar Pradesh in Delhi, regional differences in gender bias in treatment-seeking behaviour have also been observed by Basu, (1989). Differences in intra-household resource allocation have also been reported from many developing countries like India (Chudhary, 1988). Rao et al. (1998) revealed that maternal education and living standard
of the household have positive effects on Oral Rehydration Treatment rate for boys but not for girls and it is especially prevalent in the central and eastern regions of India.

5.3 Data and methodology

Besides information provided in the data and methodology chapter, this section provides more detailed information on data and methodology used in the analysis of this chapter. The analysis of this chapter is based on data from India’s third National Family Health Survey, conducted in 2005-06 (NFHS-3). NFHS-3 collected information on a number of indicators of feeding, health care, and nutritional status for children born in the five years preceding the survey. These included whether the child received adequate breastfeeding, whether the child receives milk and solid or mushy foods on a regular and timely basis, whether the child is fully immunized and whether advice or treatment was sought when the child was sick with an acute respiratory infection (ARI) or diarrhoea in the preceding two weeks. NFHS-3 additionally collected data on whether the child receives fruits and green, leafy vegetables on a regular basis and on blood haemoglobin levels of children and their mothers. The analysis is restricted to ever-married women age 15−49 and their births in the five years preceding the survey.

From the data, 10 outcome (dependent) variables were created pertaining to childhood feeding, health care and nutritional status of children under age 5. The three groups of outcome variables are:

I. Variables relating to feeding: received any liquid during the last 24 hours, received any solid/semi-solid food during the last 24 hours and breastfeeding during the last 24 hours
II. Variables related to health care: fully immunized (age 12-13 months), advice or treatment sought for ARI and advice or treatment sought for diarrhoea

III. Variables related to nutritional status: stunting, underweight, wasting and anaemia

Since, the dependent variables have two categories within them, the binary (yes or no) logistic model was appropriate here and applied for estimating regression coefficients in multivariate analysis using the binary logistic regression module in the STATA 10 software package. The detailed information about binary logistic model has already been provided in chapter II. The analysis was carried out using both descriptive and multivariate statistical methods. Units of analysis are births that occurred during the 5 years period immediately preceding the survey. Analysis is restricted to the most recent birth occurring within the 5 years reference period in cases where more than one birth occurred during the period, so that each mother gets counted only once, thereby avoiding an additional source of clustering in the sample. Attention is also restricted to cases where no child (either the index child or a previous child) died between the birth of the index child and the time of the survey. For each of the 10 outcome variables, three logistic regressions are run, one for each birth order 1, 2, and 2+ (3 and higher). In the case of birth order 1, the principal predictor variable in the logistic regression is simply the sex of the index child, defined as a binary variable that equals 1 if male (ICM) and 0 if female (ICF). In the case of birth order 2, the specification of the principal predictor variable takes into account interaction between index child’s sex and mother’s number of living sons. By interaction, it is meant that the effect of index child’s sex on a particular outcome variable differs according to the mother’s number of living sons among her previous children.
In this analysis, the principal predictor variable therefore is a composite variable that cross-classifies index child’s sex and mother’s number of living sons. The various categories of this composite variable are defined by the following dummy variables (each dummy variable takes the value of 1 if the child has the specified characteristics and the value of 0 if it does not):

- **S0ICM**: Number of living sons is 0, index child is male
- **S0ICF**: Number of living sons is 0, index child is female
- **S1ICM**: Number of living sons is 1, index child is male
- **S1ICF**: Number of living sons is 1, index child is female

In the case of no living sons, I treat “number of living sons 0, index child female” as the reference category, so that the dummy variable S0ICF is dropped from the regression equation. The coefficient of S0ICM then captures the effect of index child’s sex. The same logistic regression equation is then re-run with S1ICF as the reference category in order to make the appropriate comparison of male and female children when mother’s number of living sons is 1. In the case of birth order 2+ (3 and higher), the categories of the composite variable are:

- **S0ICM**: Number of living sons is 0, index child is male
- **S0ICF**: Number of living sons is 0, index child is female
- **S1ICM**: Number of living sons is 1, index child is male
- **S1ICF**: Number of living sons is 1, index child is female
- **S1+ICM**: Number of living sons is 2, index child is male
- **S1+ICF**: Number of living sons is 2, index child is female
The logic of the procedure for estimating the effect of index child’s sex on a particular outcome variable is the same $2+\text{ as at birth order }2$. At each specified number $x$ of living sons, the logistic regression for the specified birth order is run without the variable SxICF, so that “number of living sons $x$, index child female” becomes the reference category. The coefficient of the dummy variable SxICM then captures the effect of index child’s sex. This means that, in the case of birth order $2+$, the same logistic regression is run three times (corresponding to 0, 1, and 1+ living sons among the mother’s previous children), each time with a different reference category for the composite variable.

The set of predictor variables in the logistic regressions includes not only the composite variable, index child’s sex cross-classified by mother’s number of living sons but also a set of bio-demographic, socio-economic as control variables. The detailed description of bio-demographic and socio-economic variables has already been provided in chapter III.

### 5.4 Sex differentials in child feeding and health care

Prior to discussing the results of the multivariate analysis, the understanding of sex differentials in the outcome variable, regardless of child’s birth order, mother’s number of living sons, and other characteristics of the child or mother are presented in Table 5.1.

Results reveal that the proportion of 6-9 months old children who received any liquid during twenty four hours prior to the survey does not vary much by sex of child. However, the proportion of children receiving solid/semi-solid food during twenty four hours prior to the survey is much greater for the male children than female children. More specifically, around 69 percent of male children received solid/semi-solid foods compared with 64 percent of female children.
Male children are slightly more likely than female children to have been breastfed during twenty four hours prior to the survey. Among children age 12-23 months, boys were more likely than girls to be fully immunized. Around 20 percent of male children and 16 percent of female children were fully immunized in Uttar Pradesh. It is also noted that, male children were more likely than female children to have received advice or treatment when sick with ARI or with diarrhoea. Male and female children under age 3 were about equally likely to be stunted. About half of male and female children were stunted. The prevalence of underweight was slightly higher among children than among male children. Male children were less likely to be wasted than female children. Anaemia levels were slightly higher among male children than among female children.
Table 5.1: Prevalence (percent) of selected indicators of childhood feeding, health care and nutritional status among children under age 3 years by sex of child in Uttar Pradesh, NFHS (2005-06)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Prevalence (in percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Childhood feeding</strong></td>
<td></td>
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</tbody>
</table>
| Received any liquid during the last 24 hours | 86.2 Male  
83.9 Female |
| Received any solid/semi-solid food during the last 24 hours | 68.8 Male  
63.8 Female |
| Breastfed during the last 24 hours | 98.1 Male  
96.3 Female |
| **Immunization and health care** |                         |
| Fully immunized (age 12-23 months) | 20.3 Male  
15.9 Female |
| Advice or treatment sought for ARI | 70.0 Male  
63.7 Female |
| Advice or treatment sought for diarrhoea | 65.2 Male  
55.9 Female |
| **Nutritional status**           |                         |
| Stunted                          | 53.0 Male  
51.7 Female |
| Underweight                      | 40.8 Male  
42.5 Female |
| Wasted                           | 18.7 Male  
20.5 Female |
| Anaemia                          | 60.9 Male  
60.2 Female |
| Number of cases                  | 4453         |
5.5 Sex differentials in childhood feeding, health care and nutritional status variables by birth order and sex composition of children

Standardized sex differentials based on logistic regression estimates are presented in Table 5.2. In the regression model, sex differentials are measured by M/F (Male/Female) odds ratio after controlling for the set of bio-demographic and socio-economic variables. A M/F odds ratio for a given birth order and sex composition of children indicates the odds of a particular outcome when the index child is a girl. An odds ratio of 1.00 indicates that the odds of that outcome are the same for male and female children. Table 5.2 shows that, among birth order 2, male children were less likely than female children to receive any liquid during twenty four hours prior to the survey in families with no living son but more likely than female children to receive any liquid in families with one living son. This pattern of sex differentials is not observed at birth order 2+ (3 and higher). Moreover, among birth order 2+, male children were less likely to receive solid/semi-solid foods during twenty four hours prior to the survey in families with no living son but two times more likely than female children to receive any solid/semi-solid food in families with 1+ living sons. Sex differentials in the odds of breastfeeding during the last 24 hours do not show any clear pattern by the birth order of children and number of living sons.

Results reveal clear evidence of gender discrimination in full immunization at birth order of 2+. Male children age 12-23 months born to mothers with no living son are more than twice as likely to be fully immunized as female children in such families, while male children born to mothers with 1+ living sons are less likely to be fully immunized than female children. Evidence of gender discrimination is much stronger in the case of
advice or treatment seeking for ARI. At each birth order, male children born to mothers with no living son are more likely than female children to receive advice or treatment when sick with ARI.

Clear evidence of gender discrimination in treatment seeking for diarrhoea is found at birth order 2. In this case, births to mothers with no living son are more than twice as likely to receive advice or treatment for diarrhoea as female children. The M/F odds ratio declines to 1.54 in families with one living son and one living daughter. It is also noted that there are no significant sex differentials in the prevalence of stunting, underweight, wasting and anaemia among children under age 3 except for more stunting and wasting among male children than female children. In case of stunting at birth order 2 with one living son, male children were more likely to be stunted than female children. Similarly, at birth order 2+ (3 and higher) with 1+ living sons, male children were more likely to be stunted than female children. The same pattern of sex differentials are observed in case of wasting of children. For example, at birth order 2 with one living son, male children were more likely to be stunted than female children.
Table 5.2: Effects (M/F odds ratio) of sex of index child on selected indicators of childhood feeding, health care and nutritional status by child’s birth order and mother’s number of living sons in Uttar Pradesh, NFHS (2005-06)

<table>
<thead>
<tr>
<th>Variables</th>
<th>M/F Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Birth order 1</td>
</tr>
<tr>
<td></td>
<td>0 son</td>
</tr>
<tr>
<td>Childhood feeding</td>
<td></td>
</tr>
<tr>
<td>Received any liquid during the last 24 hours</td>
<td>1.13</td>
</tr>
<tr>
<td>Received any solid/semi-solid food during the last 24 hours</td>
<td>1.09</td>
</tr>
<tr>
<td>Breastfed during the last 24 hours</td>
<td>1.33***</td>
</tr>
<tr>
<td>Immunization and health care</td>
<td></td>
</tr>
<tr>
<td>Fully immunized (age 12-23 months)</td>
<td>1.17***</td>
</tr>
<tr>
<td>Advice or treatment sought for ARI</td>
<td>1.30</td>
</tr>
<tr>
<td>Advice or treatment sought for diarrhoea</td>
<td>1.42***</td>
</tr>
<tr>
<td>Nutritional status</td>
<td></td>
</tr>
<tr>
<td>Stunted</td>
<td>0.97</td>
</tr>
<tr>
<td>Underweight</td>
<td>1.09***</td>
</tr>
<tr>
<td>Wasted</td>
<td>1.17</td>
</tr>
<tr>
<td>Anaemia</td>
<td>1.05</td>
</tr>
</tbody>
</table>

***p<0.01, **p<0.05, *p<0.1
Note: Based on separate logistic regression for each birth order.
5.6 Summary

Results showed the existence of gender discrimination in childhood feeding, immunization, treatment seeking, and nutritional status of children in Uttar Pradesh. A consistent pattern is not observed across the board; however, the presence and extent of gender discrimination depend to a considerable extent on the birth order of the index child and the sex composition of older living siblings, which is measured as mother’s number of living sons at each birth order. Discrimination against female children is most visible in families with no living sons, particularly at birth orders 2 and 2+ (3 and higher). But not all gender discrimination in Uttar Pradesh is against girls. There is also evidence of discrimination against male children in families where older children are all males.

In case of childhood feeding, among birth order 2, it is found that male children were less likely to receive any liquid than female children in families with no living son. In contrast, such children were more likely to receive any liquid than female children in families with one living son. Moreover, among children of birth order 2+, there is evidence of discrimination against female children in feeding solid/semi-solid foods in families with 1+ living sons. Analysis of sex differentials in the odds of breastfeeding shows the gender bias against girls, as female children were found to be less breastfed compared to male children among birth order 2 with 1 living son.

Evidence of discrimination in immunization coverage against girls is found for children of birth order 2+ (3 and higher). Evidence of gender discrimination is much stronger in the case of advice or treatment seeking for ARI. At each birth order, male children born to mothers with no living son are more likely than female children to receive advice or
treatment when sick with ARI. The patterns of sex differentials in treatment seeking for diarrhoea are similar to those of ARI. The clear evidence of gender discrimination in treatment seeking for diarrhoea is found at birth order 2.

The use of composite variable of birth order and sex composition of children has been helpful in this analysis of gender discrimination in childhood feeding, immunization, health care and nutritional status of children. Confirming with the findings of previous studies (Pande, 2003; Arnold et al., 1998; Muhuri et al., 1991 and Gupta, 1987), this analysis also revealed that there are no significant sex differentials in the prevalence of underweight and anaemia except for stunting and wasting among children.