Female demographic disadvantage in India 1981-1991: Sex-selective abortion and female infanticide

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Abstract:

Using evidence from a number of sources (including the 1981 and 1991 censuses of India, prior research, and NGO reports), this article examines whether bias against girl children persists during periods of development and fertility decline, whether prenatal sex selection has spread in India as elsewhere in Asia, and whether female vs. male child mortality risks have changed. The authors present estimated period sex ratios at birth (SRBs) calculated by reverse survival methods along with reported sex ratios among infants aged 0 and 1, as well as sex ratios of child mortality probabilities (q5), from the two censuses. The findings show an increase in 'masculine' SRBs and persistent (or even worsening) female mortality disadvantage, despite overall mortality decline, due to selective neglect and the spread of female infanticide practices in some areas. Research and reports indicate the increasing use of prenatal sex selection in some regions. In India, preference for sons appears to be undiminished by socio-economic development, which interacts with cultural sources of male bias. The increased masculinity of period SRBs in some areas, together with persistent excess female child mortality and female infanticide, creates a 'double jeopardy' for girl children. Legislation curbing prenatal sex determination and policy measures addressing societal female devaluation have had little impact, suggesting that female demographic disadvantage is unlikely to improve in the near future.

Keywords: India | sex ratios | infanticide | female child mortality disadvantage

Article:

INTRODUCTION

Highlighted by sensational titles such as 'The Endangered Sex' (Miller, 1981) or 'More than 100 million women are missing' (Sen, 1992), studies have long pointed to the unfavourable life

chances of females versus males in parts of East and South Asia. This female disadvantage is particularly concentrated in infancy and childhood years, and is rooted in long-standing social patterns of preference for male children. Practices regulating the numbers of female children in a family traditionally included the post-natal methods of female infanticide, abandonment or out-adoption of girls, under-reporting of female births, and selective neglect of daughters leading to higher death rates. Lately in China and South Korea, prenatal sex determination and selective abortion of female foetuses have been increasingly implicated (Asia-Pacific Population and Policy Report, 1995; Johansen and Nygren, 1991; Park and Cho, 1995; Yi et al., 1993). When fertility declines and preference for male children remains strong, parents still take steps to ensure the birth and survival of sons, and prenatal sex determination and selective abortion of females are apparently preferable to female infanticide or abandonment of baby girls. Prenatal sex selection techniques appear to substitute for post-natal methods in these regions, as shown by increasing masculinity of sex ratios at birth, coupled with more equitable sex ratios of infant and child mortality (Goodkind, 1996). That is, fewer girls are allowed to be born, but those who are born are more wanted and tend to survive.

These issues are also significant in South Asia, which shares with East Asia a long-standing tradition of son-preference. In India, the issue has mostly been examined in terms of the masculinity of the population sex ratios observed since the first census taken in 1871 under the British Raj (Irudaya Rajan et al., 1991; Kundu and Sahu, 1991; Raju and Premi, 1992; Srinivasan, 1997; Visaria, 1969). The persistent preference for sons and disfavour toward daughters, leading to the phenomenon of 'excess female child mortality'[1] and highly masculine juvenile sex ratios (counter to the global norm of female mortality advantage and moderately masculine sex ratios among children) have been discussed as key factors in this imbalance (Agnihotri, 1996; Kishor, 1993; Miller, 1981; Saith and Harriss-White, this volume).

An important dimension of inquiry, that of changes in the relative pattern of births and survival of male versus female children in India, has been comparatively neglected, mainly due to lack of data. Indian authorities do not routinely publish data on sex ratios among births reported in the Census or Sample Registration System enumeration years. A few regional studies suggest that cohort sex ratios at birth are anomalously masculine in some parts of the country, particularly in the North (Clark and Shreeniwas, 1995 for Gujarat; Mason et al., 1992 for Karnataka; Irudaya Rajan, 1996 and Visaria and Irudaya Rajan, 1996 for Kerala). Therefore, it is not clear whether parents in India, as in East Asia, are substituting prenatal for postnatal discrimination against girl children, or whether bias against females is lessening over time. One all-India study has examined changes in juvenile sex ratios (ages 0–4) between 1981 and 1991, alongside trends in mortality sex ratios and fertility rates, and concluded that during fertility decline in India, parents are not substituting prenatal for post-natal discrimination against girls, but are combining these two strategies. Male bias thus appears to be intensifying (Das Gupta and Bhat, 1997).

Our study explores this issue further, with more region-disaggregated and age-focused data. Using the 1981 and 1991 censuses of India, we present ratios among numbers of boys and girls aged 0 and 1 (taken together to minimize the effect of age misreporting). Next, using an unorthodox application of the technique of `reverse survival' we estimate sex ratios at birth for

[1] 'Excess female child mortality' refers to the phenomenon of higher death rates of females among infants and children than males, in contrast to the `normal' pattern of higher mortality among males.

these two census years. We also present sex ratios of child mortality probabilities (q5) from the censuses for these two time points. We examine variations by rural/urban residence and state/region, drawing attention to the specific sub-regions of India where changes have taken place over the decade. We summarize what has been reported about the incidence of prenatal sex selection and female infanticide in India, and place the evidence within the context of social and economic development in India, especially relating to the situation of women.

The rest of this article presents critical syntheses of prior research and reporting on gender-specific demographic trends in India. Arguments concerning the possible impact of social and economic development on gender stratification, and the consequent differences in the valuation and wantedness of male and female children, are summarized. Subsequently, the observed and estimated birth and mortality ratios calculated from the censuses are presented. The concluding section discusses the implication of the arguments and findings.

GLOBAL PATTERNS IN SRBs

Sex ratios at birth (henceforward SRBs), refer to the ratio of male to female children born in a specific period, such as a year, or among all the children ever born to cohorts of women. In most human populations, more boys than girls are conceived, and despite greater male than female foetal wastage, more boys than girls are born. This leads to a fairly stable SRB observed among human populations in countries with good vital registration, of approximately 104 to 106 boys per 100 girls (Johansen and Nygren, 1991). Subsequently, mortality rates at every age are slightly greater for boys than for girls due to a combination of biological and behavioural factors. Thus, with increasing age, the population sex ratio balances out to a slight female dominance overall. Most societies irrespective of level of income or development exhibit this pattern.

In societies that have a marked preference for male children, however, a different pattern is seen. In South Asia, population sex ratios are persistently male dominant. In East Asia, period SRBs appear highly masculine especially in recent years. In South Korea and China respectively, both of which have good coverage of vital registration, SRBs as high as 112 and 113 males per 100 females have been observed among all births. First order births are within the normal range (approximately 104–6 in each society). Second and higher order births, however, soar up to 120 and more for China, and third and higher order births to 185 and more for South Korea (Asia-Pacific Population and Policy Report, 1995). Clearly, therefore, biological patterns of SRBs are in these regions being overwhelmed by behavioural factors rooted in parents' preference for at least one male child (Coale and Banister, 1994; Hull, 1990; Johansen and Nygren, 1991). These skewed SRBs combined with anomalously masculine sex specific survival rates have generated the problem of millions of `missing' females in East and South Asia (Coale, 1991; Sen, 1992).

Several mechanisms are advanced to explain the phenomenon of excessively masculine SRBs. In China, mechanisms include non-reporting of female births (leading to omission of girl children in all subsequent official records, tantamount to denying their social existence), abandonment and/or out-adoption of girls, and female infanticide (Hull, 1990; Johansen and Nygren, 1991). All these mechanisms can be viewed as varying types of discrimination against female children. Lately, in China and South Korea where there is a combination of lowered fertility, continued strong son preference, and widespread access to medical facilities, the increased use of prenatal

sex determination techniques leading to abortion of female foetuses is implicated in the phenomenally higher masculine birth order sex ratios observed there (Asia-Pacific Population and Policy Report, 1995; Park and Cho, 1995; Yi et al., 1993).

REGIONAL TRENDS IN JUVENILE SEX RATIOS IN INDIA

In India, most analyses focus on juvenile sex ratios rather than sex ratios at birth. This is firstly because of the concern that excess female child mortality, which arises from the selective neglect of girl children compared to boys, manifests itself in childhood years rather than around the time of birth (Das Gupta, 1987; Dyson, 1988). Secondly, data on period sex ratios at birth are difficult to obtain in India, as the Census of India does not publish this statistic. Such data are only occasionally published by the Sample Registration System (SRS) of certain states, and thus nation-wide or time-trend analyses are ruled out. Vital statistics registration is of varying quality and completeness in different parts of the country, as are hospital records. Thus all-India or time-trend investigations of period SRBs are difficult, although some intra-state analyses are emerging (Visaria and Irudaya Rajan, 1996, for Kerala).

Regional analyses of juvenile sex ratios in India on the whole indicate that more masculine juvenile sex ratios and higher female than male child mortality go hand in hand (Agnihotri, 1996; Clark and Shreeniwas, 1995; Das Gupta, 1987; Das Gupta and Bhat, 1997; Kishor 1993). That is, higher juvenile sex ratios at ages 0–4 are accompanied by higher female than male child mortality at ages 5–9. A well-known regional pattern is observed: the Northern and Northwestern parts of India, including the states of Punjab, Haryana, Rajasthan and Western UP, are areas most unfavourable to the life chances of female children. Other parts of the country, including the East, Central area and the South, exhibit more balanced rates.

A broad generalization has been made: the North/Northwestern regions of India fall within the so-called Northern cultural and demographic zone, distinguished by higher fertility, higher mortality, more masculine sex ratios, and lower status of women. This zone traditionally had a wheat-based agrarian economy (where women are less involved), and social systems marked by dowry, exogamous marriage[2] and the seclusion of women. In contrast, the South is broadly characterized by rice-based agrarian systems (with a greater role for women), endogamous marriage systems, marriage payments that are more egalitarian between brides' and grooms' families, and less seclusion of women. Women's literacy and education levels are also much higher in the South than the North. The status of women is higher in the South, which also has lower fertility and mortality rates, and more 'normal' sex ratios (Dyson and Moore, 1983).

Other scholars rightly stress that the simplistic dichotomization of India into 'Northern' vs. 'Southern' zones is inadequate. The rice-cultivating Eastern region could never be fitted into either pattern. Within-region variations have been ignored in the dichotomization, such as the 'belt of female infanticide' in the Salem/Dharmapuri/Madurai districts of Tamil Nadu noted by

[2] Exogamy refers to the practice whereby the bride marries outside her natal kin, clan or lineage circles or village. It is argued that exogamous marriage makes women more vulnerable, by separating them far from their natal kin, and placing them in the position of outsiders in their marital families, until they 'prove themselves' by giving birth to sons and by bringing dowry and other gifts from their natal home. Conversely, endogamy refers to the practice of marrying within specific kin, clan or lineage circles or inside one's natal village, and is less detrimental to women.

Chunkath and Athreya (1997). Alternative spatial patterns ranging from five to nineteen clusters of India's districts have been proposed, taking into account ecological and economic sub-regions, areas with greater proportions of Scheduled Caste/Scheduled Tribe populations (who are characterized by more gender-egalitarian cultures), and other criteria. Even in these alternative groupings, however, juvenile sex ratios appear most masculine in the North/Northwestern region of India. A so-called 'Bermuda Triangle' for the female child exists in a zone of twenty-four districts including parts of Haryana, Western Uttar Pradesh, some of Rajasthan, and the ravine areas of Madhya Pradesh (Agnihotri, 1996).

FEMALE DEMOGRAPHIC DISADVANTAGE IN THE CONTEXT OF DEVELOPMENT

Globally, it should be pointed out that gender-imbalanced demographic measures are by no means simply associated with poverty or 'under-development', such that poorer nations have more female disadvantage. African, Latin American and Caribbean nations, all with varying development philosophies, levels of poverty and living standards, exhibit 'normal' sex ratios at birth and of mortality. Any gender inequalities these countries may have is apparently manifested in other domains. On the other hand, countries such as China, South Korea and India which have a socio-cultural pattern of preference for male children, irrespective of level of development and philosophy of economic organization, exhibit gender imbalances in demographic measures that persist over time.

In India, too, the relationship between social and economic development and female disadvantage is not clear-cut. On the broadest level of generalization, the process of development in India has been mostly to women's detriment. The 1974 Report of the Committee of the Status of Women in India (GOI, 1974) was the first to point out that despite the progressive promises and provisions of the Indian constitution, development since Independence had been accompanied by a deterioration in women's situation, indicated by worsening sex ratios, declining female work participation rates, and persistent shortfalls in literacy and female mortality.

Neither has the trend since that time been positive. The majority of Indian women are involved in the agricultural sector, and have been adversely affected by agrarian development. First, while land reforms focused on redistributing land to the landless, in practice ownership was invested in the *household* head, always seen as the senior male. Women's alienation from the most critical productive resource was thus progressively institutionalized. Women's use rights in land, where they exist, are exercised during the goodwill of the male kin who have effective control over the land (Agarwal, 1994).

Second, although the Green Revolution dramatically increased food production and allayed fears of population growth outstripping food supply in India, it adversely affected women's work participation. Evidence from Punjab, Haryana, UP, and Tamil Nadu shows that the Green Revolution narrowed the range of agrarian tasks, displaced women from traditional occupations, and placed them at the bottom of the new labour hierarchies. Women's occupations became increasingly impermanent and casualized due to technological changes coupled with traditional norms about the gender-based division of labour (Kapadia, 1992; Nayyar, 1989; Nigam, 1988;

Sen, 1982). Although the initial impact of Green Revolution technology was to increase the demand for labour to fertilize, weed, and harvest the new High Yielding Varieties (HYVs), this trend was short-lived, and tended not to involve women. For example, farmers in Gujarat utilizing HYV technology preferred male to female labour since they felt that men were more efficient, more suited to the 'high-technology' innovations, could work for longer hours at a stretch, and could fulfil demands for group labour. Although women received lower wages than men for the same work, they had no training for even the simplest new tasks such as spraying, and were thus excluded (Hirway, 1979). In Bihar as in Gujarat, female work participation grew substantially less in irrigated districts, and the rise of mechanized dehusking and flour-making industries deprived women of significant work they had hitherto performed (Hirway, 1979; Sinha, 1988). Varghese (1991) states that rural Indian women's paid work participation is declining, and that women are highly concentrated (approximately 80 per cent of female workers) in the agricultural labour and unpaid family work sectors. The increased casualization of female labour is accompanied by consistently greater unemployment among women than men. He concludes that the 'female marginalization thesis' is supported in the Indian agrarian context.

Non-farm opportunities have not kept pace with the displacement of rural women. Though Deshpande (1992) shows that many urban women workers are absorbed into new occupations such as in export processing zones, and argues that despite low wages and poor working conditions they contribute up to one third of household income, pull their families above the poverty line, and thus gain a measure of respect and autonomy, Ramaswamy (1993) argues that the vast numbers of women (94 per cent of the total female work force) in the unorganized occupational sector indicates the failure of the Indian planning process with respect to women. The organized sector, depending on newly emerging technologies, offers little to the many women displaced from rural or sunset industries. There are opportunities only for those with education and skills. Though female literacy is rising, parents in much of India do not encourage their daughters to attend more than a few years of school, since higher education is seen as an unprofitable investment in girls who will marry and move to their husbands' households. Much of the impetus for girls' education comes from the increasing demand for literate brides on the part of young educated men. Women thus cannot compete for the new opportunities in significant numbers. Moreover, the masculine bias of the organized sector tends toward decreased security of even those women involved, as Indian trade unions usually downplay the needs of women workers, who have had to set up parallel organizations as a result. Ramaswamy (1993: 323) concludes that in India, 'developmental processes have only pushed women to states of survival'.

However, development has marginalized women in other less affluent nations too, which none the less continue to exhibit gender-balanced demographic measures. The fact that economic development devalues women is not sufficient on its own to make families discriminate against daughters. It is pointed out that both economic and cultural factors are jointly responsible for the variations in the status of women, and consequent sex differentials in the wantedness, birth, care and survival of male and female children (Kishor, 1993).

Socio-cultural trends in India also place women at an increased disadvantage. The traditional patrilineal, patrilocal, and exogamous marriage and kinship systems prevailing over much of the subcontinent have always placed women in a low-status, precarious position, until they earn their

place in the patriline by bearing sons. Although the southern part of the subcontinent had more endogamous and egalitarian marriage systems, with matrilineal family forms in many Southwestern coastal communities, social change in these regions has tended to move towards normatively patrilineal systems. Significantly, scholars also note the spread of dowry[3] nationwide to communities and castes where it had never been the custom. Insufficient research attention has been paid to this phenomenon. The bulk of sociological or anthropological research in India on the topic of kinship is abstract and descriptive in nature, viewing women as objects of study and exchange, and not problematizing the underlying causal and consequential gender relations (Agarwal, 1994; Ramaswamy, 1993). Some scholars have begun to address this issue (for instance, Palriwala and Risseeuw, 1996), but there is little scrutiny of the relationship between kinship organization, gender relations, and women's life and death chances.

Some attribute the spread of dowry to the process of 'Sanskritization', whereby lower castes achieve upward caste and class mobility by emulating the customs of the upper castes, including dowry and female seclusion. Others attribute the changes to the young age structure of the country: the greater ratio of young marriageable girls to potential mates in the higher age group increases the 'price' of grooms (Rao, 1993). The rise of consumerism is also implicated, drawing people into a growing web of expectations and demands. The continued importance of kin networks for economic resource mobilization, the spread of the dowry custom, the growing amounts of dowry changing hands, and the increasing importance of resource acquisition strategies for family status enhancement, have led to the concentration of wealth in families where the ratio of male children is greater, and female children are therefore increasingly seen as liabilities (Clark, 1987; Heyer, 1992).

The socio-economic bases of female mortality disadvantage have been examined with all-India level, and smaller-scale, localized analyses. All-India studies suggest that districts with higher indicators of conventional development, such as urbanization, industrial output, and agricultural productivity had significantly lower female vs. male survivorship, while girls in areas with a greater concentration of Scheduled Caste/Scheduled Tribe populations (with largely more gender-egalitarian norms than the Indian mainstream), endogamous marriage patterns, and greater female empowerment measured by women's labour force participation and education, fared better (Agnihotri, 1996; Kishor, 1993; Murthy et al., 1996). These studies identify a constellation of economic and cultural factors jointly affecting female mortality disadvantage, improving on earlier and simpler models of female agrarian labour force participation alone (Bardhan, 1974).

The findings of smaller-scale studies do not, however, lend themselves to such consistent generalizations. The role of women's education in ameliorating female child mortality disadvantage might seem self-evident, and the district-level studies cited above support the notion. However, smaller-scale studies in rural Punjab and Gujarat indicate that mothers with some education might actually be more efficient in discriminating against their daughters, particularly in asset-poor households. Schooling may make women more aware of health,

[3] Dowry is the transfer of wealth, in the form of money, gold, consumer goods, or other assets, from the bride's parents to those of the groom. Although the custom is supposed to provide the bride with pre-mortem inheritance of her share of her family's property, in practice, she has little control over the dowry, and her in-laws dispose of it as they wish.

hygiene and nutrition, but female education alone is not enough to transcend the nexus of conditions that leads families to consider daughters a liability. Education often domesticates women rather than liberates them (Clark and Shreeniwas, 1995; Das Gupta, 1987).

Regarding the role of economic assets, studies in rural Tamil Nadu suggest that female child mortality disadvantage is greater among the landed and upper-caste groups, where women are also more secluded and have lower rates of work participation (Harriss-White, 1998; Heyer, 1992). In one Green Revolution community of UP, and in a dairy co-operative region of rural Gujarat, however, lower caste and landless groups are the ones where daughters appear in greater jeopardy (Clark and Shreeniwas, 1995; Wadley, 1993). While the specific castes involved depend on local conditions, the common factor is the family's effort to acquire land or other economic advantages through mobilizing kinship networks and manipulating the marriages of their sons and daughters. In a patrilineal kinship system where marriages are arranged on principles of dowry and hypergamy, and where women are objects of exchange along with other forms of wealth, excess female mortality is argued to be an inevitable outcome (Clark, 1987).

Contradictions notwithstanding, a pattern is discernible where increasing economic marginalization and social devaluation make daughters increasingly viewed as liabilities. Productive activities and resources are increasingly concentrated in the hands of men. Conventional socio-economic development accentuates rather than ameliorates this trend. Families therefore respond by discouraging the birth and survival of female children. Numerous studies document widespread gender inequality within households in the allocation of food and health care; women and girl children have last priority. This directly heightens female child mortality (reviews in Agarwal, 1994; Kishor, 1995; Miller, 1997). The role of selective neglect of daughters in excess female child mortality has been more extensively researched in the Indian context, and is not addressed in this paper. We instead scrutinize the related practices of female infanticide and foeticide, which have been less examined in India for reasons obviously connected with the sensitivity of the issues. The main findings not surprisingly come from the documentation efforts of women's groups and NGOs active in these fields rather than from academic research.

FEMALE INFANTICIDE IN INDIA

Infanticide is an age-old post-natal practice among human populations to regulate the numbers of children and eliminate less wanted offspring. The practice of 'exposing' girls or weak or deformed babies was noted in ancient Roman and Greek society in the West (Scrimshaw, 1984). Little is known about female infanticide in India prior to the advent of British observers (Miller, 1987). However, since then, female infanticide has been widely recorded among upper caste (especially Rajput) groups in Northern and Northwestern India.

Historically, the main reasons for this practice in India included the system of hypergamy, whereby women must marry into a social sub-group above their own. Among the uppermost castes this was impossible. Since it was unthinkable that the rules of hypergamy could be transgressed, or that girls could remain unmarried, girls in these groups were killed and boys married females from sub-castes slightly lower than their own. Nineteenth century records show large groups of villages in Rajasthan and Gujarat, comprising several hundred upper-caste

households, where no female child had been allowed to survive for many generations (Vishwanath, 1996). In that era female infanticide was also part of a set of household strategies among these same land-owning upper-caste groups, to acquire further holdings and improve and consolidate their socio-economic status. This was achieved through manipulating the marriage of sons and acquiring dowry from daughters-in-law; daughters, as dowry-takers, were clearly a liability in this scheme of things (Clark, 1983). Thus, the twentieth century socio-economic processes linked to female societal devaluation and demographic disadvantage discussed in the previous section, are foreshadowed in the nineteenth century.

Similar processes are suggested to explain the spread of female infanticide in modern India. Female infanticide has been recently noted among some castes in remote village clusters in South India, in Tamil Nadu state, a region where this practice was historically little known. Increasing landlessness and poverty, an escalating dowry custom, high gender differentials in wages, low education among women and few economic opportunities for them are suggested as reasons (Chunkath and Athreya, 1997; George et al., 1992). Newspaper reports describe the conditions of poverty and misery of the families who turn to female infanticide, and their suspicion of alternatives such as adoption offered by the Government and grassroots organizations in the region (Aravamudan, 1994). Government plans to tackle the problem range from a 'cradle baby' adoption system for unwanted girl children, to economic incentive packages for women who only have daughters and who agree to undergo sterilization. The coercive design of some of these schemes, and corruption and inefficiency in their management, have led to their falling short of their targets and having a very limited impact on the problem. In 1995, an estimated 3174 female infanticides occurred in Tamil Nadu state (George, 1997).

In rural North India, the historic practice of female infanticide apparently never died out. Jeffery et al. (1984) state that up to the 1900s female infanticide was practised among Rajput castes in Bijnor, UP state. Their study in the 1980s in villages around Bijnor town noted that part of a traditional birth attendant's duties continued to be disposal of unwanted (i.e. girl) children at birth. They also report that the practice is spreading across the social spectrum to caste groups among whom it had never been practised.

The same observation is made in rural Bihar state. In 1995, Adithi, an NGO working in rural Bihar and having an excellent rapport with its target population, conducted an in-depth investigation. It revealed that female infanticide, foeticide, and excess female child mortality due to selective neglect were widespread in the eight districts studied. Infanticide was carried out by dais (traditional birth attendants), who were coerced by the senior male kin of the woman giving birth, overriding the protests of the women in the family. Fear of reprisals, poverty, lack of alternative occupation, and socialization to obey the commands of those in authority led the *dais* to comply. Other medical practitioners such as compounders and doctors also carried out infanticide when approached by the family members of a newborn girl. There was no difficulty in committing infanticide, because the birth and death followed quickly upon each other, with no certificate recorded for either event. Unscrupulous medical practitioners also conducted abortion of female foetuses, especially after techniques like sonography became widespread. The traditional skill of *dais* in identifying the sex of a foetus in the seventh or eighth month of pregnancy is also used to avert the birth of a daughter. Estimating a count of 68,000 *dais* in seven contiguous and culturally similar districts of Bihar, and that each *dai* killed about two infants a

month (according to the interviews), Adithi (1995) estimates that the number of female infanticides each year in these districts could total as many as 1,632,000.

The Adithi report noted that whereas previously only upper castes such as Rajputs and Brahmins practised female infanticide, the custom has now spread to all other groups in the rural spectrum, including Scheduled Tribes, Christians and Muslims. The main reasons are the spread of dowry with exorbitant demands, due to marginalization of women from traditional occupations and the concentration of income in the hands of men, with the consequence that women's seclusion and dependence on men increased, and men began to assert their right to emulate upper caste customs, including the practice of female infanticide. Emulation of upper caste social customs would enable the men to tap into upper caste economic networks to further upward class mobility. This spread of female infanticide across the Indian rural spectrum supports the arguments made above about the association of women's social devaluation and economic marginalization with female demographic disadvantage.[4] The underlying socio-economic processes, first analysed for the nineteenth century and intensifying in the twentieth century, can be seen as going hand-in-hand with the persistence of excess female child mortality and the spreading infanticide custom. The question of whether some families turn to female foeticide as an option thus arises.

PRENATAL SEX DETERMINATION AND SEX-SELECTIVE ABORTION IN INDIA

Unlike countries in East Asia, statistics on period sex ratios at birth, which would have enabled us to assess the birth patterns of boys versus girls and thereby make direct inferences regarding sex selective abortion, are not available for India. Statistics on abortion are also incomplete and largely unavailable. In order to examine the possibility of the spread of female foeticide in India, we thus turn to other kinds of evidence. In this section, we summarize reports from a variety of sources about the increasing availability and use of prenatal sex selection techniques. In the next section, we estimate sex ratios at birth from the available census data. We then discuss the picture that emerges from these complementary pieces of evidence.

Abortion was legalized in India in 1971, after a 1965 UN mission to India recommended this step to strengthen the population policy, and the report of the 1966 Shantilal Shah Committee also advocated it to reduce the numbers of illegal and unsafe abortions. Although the stated reasons for passing the Medical Termination of Pregnancy (MTP) Act were humanitarian (to 'help' victims of sexual assault), health-related (to provide an alternative to those whose contraceptive measures failed) and eugenic (to reduce the numbers of 'abnormal' children born), there was a strong population control motivation underlying the passage of the Act (Menon, 1996).

In 1975, amniocentesis techniques for detecting foetal abnormalities were developed in India, at the All India Institute of Medical Sciences, New Delhi. It was soon known that these tests could also detect the sex of the foetus, and doctors at the Institute noted that most of the 11,000 couples who volunteered for the test wanted to know the sex of the child and were less interested in the possibility of genetic abnormalities. Most women who already had two or more daughters and

[4] Violence against women is growing, within and outside the home. Bihar has extremely low female literacy: 23.1 per cent (Adithi, 1995).

who learnt that their expected child was female, went on to have an abortion (Chhachhi and Sathyamala, 1983).

Between 1977 and 1985, in an effort to curb this misuse of the technique, three circulars were sent to Central and State government departments making the use of prenatal sex determination for the purpose of abortion a penal offense (Kulkarni, 1986). Women's groups, civil liberties groups and health movements also launched a campaign against prenatal sex determination and female foeticide (termed 'femicide'). In 1984, a broad-based coalition, the 'Forum Against Sex Determination and Sex Pre-selection' (FASDSP) was formed, with headquarters in Bombay, to monitor all aspects of the situation, and document the growing use of the technique, and the legal and policy steps taken against it. As a result of these efforts, the state government of Maharashtra passed the Maharashtra Regulation of the Use of Prenatal Diagnostic Techniques Act in 1988. The states of Punjab, Gujarat, and Haryana followed suit and the Central Government passed the Prenatal Diagnostic Technique (Regulation and Prevention of Misuse) Act in 1994. The Act states that determining and communicating the sex of a foetus is illegal; that genetic tests can be carried out only in registered facilities; and only offered to women who meet certain medical criteria, such as being over the age of 35, having a family history of genetic disorders, and so on.

However, these acts are full of loopholes. Most restrictions pertain to government facilities. Private laboratories and clinics are not banned from carrying out tests that can be used to reveal a foetus's sex: they must only be registered. While they are forbidden to communicate the foetus's sex, many evolve covert methods by which to do so. Second, the government can overrule the decisions of the body set up to monitor facilities, which is empowered to suspend or cancel the licences of offending clinics or laboratories. The government can also exempt any facility from the Act. While in Maharashtra the monitoring committee included representatives of NGOs, the State Directorate of Medical Education and Research, and the Indian Council of Medical Research, the Central Government Act appointed only two State employees as regulators. Given the dubious record of the State as a monitoring body, the Act is thus considerably weakened. Further, an ordinary citizen cannot directly move the courts, but must approach the monitoring body, which can refuse to release any records if it is deemed in the public interest to keep them sealed. Moreover, these regulations cover ultrasonography facilities to a lesser extent, and this technique is also being widely used for sex determination. The possibility that newer technologies will be developed to determine a foetus's sex has not been allowed for (Arora, 1996; Menon, 1996; Sengupta, 1992). The result of such partial regulation is that sex determination facilities have privatized, commercialized, and mushroomed. Doctors indicated that despite bans, they would continue to communicate the sex of the foetus to parents who wanted to know, verbally rather than in writing, and would hike the test fees to compensate for the legal risk. The Maharashtra bans did not have much impact as sex determination facilities continue to operate in that state (Kishwar, 1995). One study asserts that sex selection continues to be the major purpose of prenatal diagnosis in India (Wertz and Fletcher, 1993).

Systematic studies clearly indicate the increasing spread and acceptability of the techniques. A 1982 study in Ludhiana, an urban area in Punjab state, randomly sampled 126 individuals, of whom approximately half each were male and female and most of whom were educated and middle class. All the respondents had heard of the amniocentesis test; 66 per cent of them thought it was intended for sex determination; few knew that it was actually for detecting foetal

abnormalities. While 73 per cent of the women and 59 per cent of the men believed that a girl should be aborted if the couple already had two or more daughters, only 25 per cent of the respondents felt that a boy should be aborted if the couple already had two or more sons. The reasons given indicated the nature of male-dominated society, dowry problems, greater responsibilities in bringing up daughters, and social pressure to bear sons. Over 71 per cent of the respondents felt that amniocentesis as a sex determination test should not be banned (Singh and Jain, 1985). These results were uncannily echoed over a decade later, in rural Maharashtra state, among six villages of Pune district, three with road and access to a health facility, and three others more remote and without these amenities. Results indicated that 49 out of the 67 women interviewed in-depth were aware of ultrasound and/or amniocentesis techniques and 45 per cent of those who knew approved of aborting female foetuses. Only four women were aware that such tests were actually for the detection of foetal abnormalities (Gupte et al., 1997). The spread of awareness of these techniques to rural areas is thus clearly documented.

The increase in number and reach of facilities offering sex determination and abortion is also clear. In the early 1980s, Jeffery et al. (1984) noted that in villages adjacent to Bijnor town in UP state, clinical services offering sex determination and abortion had already appeared. The first newspaper reports of private clinics offering sex selection techniques appeared in 1982–3, in cities such as Amritsar, Bombay, and Delhi. Within two to three years, the numbers of such clinics rose to several hundred in the larger cities, and several dozen in smaller towns in Maharashtra, UP, Punjab, and Gujarat states. A few clinics reportedly had begun to offer services from the late 1970s onward, but were brought to widespread public attention and formed the subject of a Parliamentary debate only in the early 1980s, after a senior and well-connected official's wife underwent an abortion of a foetus that was mistakenly diagnosed as female but turned out to be male (Ahluwalia, 1986). The ensuing media storm ironically only served to increase awareness of the techniques.

The use of these techniques thus became widespread not only in towns, but also among rural areas with access to a road or transport system to the nearest town. Newspaper reports describe mobile sex selection clinics, offering ultrasound detection and immediate abortion if the foetus is female, in smaller towns of Haryana state in the mid-1980s. The clientele included farmers who had come from villages half-an-hour away by road (Vishwanathan, 1991). Remote districts that lacked basic amenities such as drinking water or electricity were reported to have sex determination clinics; where refrigeration and cold chain facilities for vaccinations were not available but amniotic fluid samples were sent in ice packs to towns for testing (FASDSP and Saheli Women's Resource Centre, nd, cited in Menon, 1996). Grassroots workers and concerned medical practitioners have observed an increase in female foeticide in all segments of society in rural Bihar state, especially after sonography techniques became common. Unscrupulous doctors identify the sex of the child, and provide abortion if it is female (Adithi, 1995).

Nor is the cost of the test (ranging over time from Rs 500 to over Rs 1000) a barrier. While we may expect that the largest consumers of such tests will be those with at least a modicum of disposable income, education, and awareness of medical technology, landless labourers and marginal farmers are also apparently willing to take out loans at high rates of interest to avail themselves of these tests (FASDSP and Saheli Women's Resource Centre, nd, cited in Menon, 1996). In 1981–2, the approximate average daily wage of a skilled male agricultural worker in

Punjab was Rs 25, that of female and male field or other workers ranged from Rs 10 to Rs 13. In Haryana, the figures are Rs 18 for skilled workers, and Rs 7–15 for female and male field and other workers. By 1991–2, the figures were Rs 84 for skilled male workers in Punjab, Rs 77 in Haryana, and around Rs 40 in Bihar and Tamil Nadu. Field workers in these states earned Rs 30–40 in Punjab/Haryana, and Rs 20–5 in Bihar and Tamil Nadu (Government of India, 1983; 1993). Thus, even taking the seasonality of wages, other expenses, and rural indebtedness into account, affording the price of a sex determination test would not be totally out of the question even for the poorer sections of rural society, especially in the relatively rich states of Punjab and Haryana. The logic underlying the motivation is illustrated by the now infamous slogan: 'Better Rs 500 today than Rs 500,000 tomorrow' that was widely used in the early 1980s to advertise sex determination clinics until protests from women's groups put a stop to it. The slogan may no longer be used, but the underlying logic — that an expenditure now (on the test) will save many multiples of the sum later (on dowry, if the foetus is a girl) — still holds.

Performing the tests has become an extremely profitable practice for doctors. A rough calculation may be made, that if the fee for a test is currently around Rs 1000, and a clinic performs ten to twelve such tests a day, based on a six-day work-week, a clinic can gross up to Rs 2.8 lakh (one lakh = one hundred thousand; currently approximately 42 rupees = 1 US $) per month. Some newspaper reports describe the tremendous wealth amassed by practitioners offering this facility, and how training doctors in the techniques has itself become a lucrative business. Nor is this trend toward exploitation confined to the 'modern' medical sector. In March 1991, health and consumer groups in Gujarat successfully lobbied the State Government to ban a best-selling herbal pharmaceutical product called 'Select' that, according to the manufacturer's claims, used an ancient Ayurvedic technique called 'Punsavana Prayog' to change the sex of a pregnant woman's foetus to male (VHAI, 1992).

Attitudes of medical practitioners reveal that they view sex determination tests as a 'humane' service they provide to couples not wanting any more daughters; as a regrettable but unavoidable result of the preference for sons in Indian society which they feel powerless to change; and as a necessary weapon in the 'population control' arsenal (Kulkarni, 1986). Many also argue that aborting a female is preferable to condemning an unwanted daughter to a lifetime of neglect and abuse. These attitudes are also echoed among large sections of the general public (Ravindra, 1995). Further, some eminent economists also endorse the argument that abortion of females is preferable to neglect, and assert that if the sex ratio of India further worsens as a result of these technologies, then the law of supply and demand will operate and raise the value of women; thus curbing these tests and technologies is unnecessary or even retrograde (Kumar, 1983a, 1983b).

Making even approximate computations of the numbers of such procedures occurring in India is difficult. One retrospective estimate (Saheli Women's Resource Centre, cited in Arora, 1996) suggested that between 1978 and 1982 nearly 78,000 female foetuses were aborted after sex determination tests. Arora (1996) also cites a statistic purporting to come from the Registrar General of India, that based on hospital records alone, 3.6 lakh female foetuses were aborted in India between 1993 and 1994.

ESTIMATING SEX RATIOS AT BIRTH IN INDIA

To complement such reports, and to assess the geographical spread and the magnitude of impact of the increasing use of prenatal sex selection in India, we use data from the 1981 and 1991 censuses. We present sex ratios of children aged 0 and 1, i.e. under age 2.We then estimate sex ratios at birth by means of the 'reverse survival technique' (UN Manual X, 1983: Chapter VIII), using the counts of boys and girls aged under 2 and observed male and female q2 mortality probabilities in the 1981 and 1991 Census of India records, fitting to a South Model Coale and Demeny Life Table (Coale and Demeny, 1966). In essence, the technique is based on the notion that children aged *x* are the survivors of births that occurred *x* years ago. Therefore, it is possible to take the numbers of children observed at age *x*, and observed mortality probabilities for children in that population and, using a model life table suitable in shape and level of mortality for the population in question, 'resurrect' the numbers who have died. Here, we 'resurrect' the numbers of boys and girls under age 2 who died prior to the census enumeration, add them to the numbers of reported males and females aged under 2, and take the ratio of male to female children in the resulting total, to estimate a sex ratio at birth.

The authors warn that the reverse survival technique is sensitive to age misreporting, especially for children aged 0 or 1. Das Gupta and Li (in this volume) state that Indian census data show marked age-heaping, especially at young ages. Our estimates overcome this potential danger by basing calculations on children aged 0 and 1 taken together, i.e. those under age 2. (In calculations not presented here, we examine sex ratios among infants aged 0, and the results are very similar to those among infants aged <2; none differed by more than 2 per cent.) Moreover, we use this technique to generate sex ratios among children ever born, not to present or evaluate estimates of actual fertility. Even if there is a nation-wide tendency to under-report the numbers of females (a contention doubted by Visaria, 1969), the comparison we present, that is the trend over time in sex ratios, should not be affected. In the absence of reliable statistics on abortions or on period sex ratios at birth, we argue that infancy sex ratios and estimated SRBs provide information that can illustrate and evaluate the impact of continuing son preference in India, under conditions of social change, economic development, declining fertility and mortality, and spread of new medical technologies.

It was pointed out some time ago that the distribution of prenatal sex determination facilities in India was greater in areas where females were more devalued, i.e. the North/North-west (Patel, 1988). During the decade covered in this study (1981–91), reports suggest that such techniques were more widely available in urban areas, although there is every indication that their awareness and use spread into the rural hinterlands too. Urban areas are characterized in developmental terms by higher female literacy, more non-agrarian employment opportunities, more paid employment opportunities for women, and better infrastructure, including availability of health services. Moreover, a more egalitarian ethos may accompany increasing education, income, and exposure to diverse groups and thoughts.

Thus, while scrutinizing the estimated SRBs, one might contrast urban/rural SRBs over the decade, to investigate whether urban SRBs grow progressively more 'normal' with improved education and greater accuracy of reporting/recording births, and decreasing scope for female infanticide or abandonment of girls. On the other hand, if gender stratification in India is intensifying, attested by the increase of phenomena such as dowry and economic marginalization of women, many urban families would not necessarily have greater incentive to welcome

daughters. They would also have more access to the means to avert their birth, i.e. prenatal sex determination and selective abortion, which may be seen as more acceptable and practicable alternatives to female infanticide, abandonment, or non-registration of girls' births. In fact, families with some amount of education and disposable income might have better access to these techniques and thus be more efficient in discriminating against their daughters. Particularly with fertility falling in many parts of the country, with urban areas in the forefront, Indian families may take steps to ensure that at least one son is born to them, as do Chinese or Korean families. Thus, if urban SRBs grow anomalously masculine over the decade, the most likely cause is the increasing use of prenatal sex selection techniques rather than under-reporting, infanticide, or abandonment of baby girls.

Appendix Table 1 presents the observed sex ratios among infants aged under 2, and the corresponding estimated SRBs for rural and urban areas of each state, for 1981 and 1991. Ratios are presented here as males per 100 females. There is, by and large, little difference between sex ratios at ages 0 and 1, and estimated sex ratios at birth. As may be expected, once mortality at infant ages is taken into account, most ratios lessen, but only very slightly. However, in some states, predominantly in rural areas, the ratios heighten slightly, such as in rural MP, North-eastern states (Mizoram, Nagaland, Arunachal Pradesh, Tripura), and the South (rural Kerala, Tamil Nadu and Karnataka, urban and rural Maharashtra and Orissa). In 1991, far fewer regions show this pattern: Himachal Pradesh, and urban parts of Sikkim, Goa, Dadra and Nagar Haveli, and Pondicherry. The census was not conducted in Assam in 1981, and in Jammu and Kashmir in 1991, thus the corresponding Table and Figure entries are blank.

Spatial and Temporal Trends in Estimated Sex Ratios at Birth

The spatial distribution of trends in estimated SRBs from the two censuses are presented in Figure 1, which identifies rural and urban areas of those states with 'abnormally' masculine SRBs (i.e. >107). The actual sex ratio values on which Figure 1 is based are presented in Appendix Table 1.

Figure 1 shows that in 1981, most parts of the country exhibited SRBs that were not 'abnormally' masculine. The few masculine regions were mostly within the North/North-western zone such as urban Punjab, Jammu and Kashmir, and Chandigarh, also urban Gujarat in the West, and, surprisingly, the Lakshadweep Islands off India's South-west coast. Appendix Table 1 shows that the 'masculine' SRBs mostly have values at the lower end of the range (107–110). Thus, in 1981, we can conclude that SRBs in India were in general not very masculine. Appendix Table 1 bears this out by showing all-India values within the normal range.

In 1991, Figure 1 shows a greatly changed picture. We see masculine SRBs not only in the urban areas of the North/North-western zone (Himachal Pradesh, Punjab, Rajasthan, Haryana, Delhi, and Chandigarh), but in the corresponding rural areas, and a spread of anomalous masculinity outward from this zone to urban areas of Central and Western zone states, namely Gujarat, UP, MP, Bihar, Maharashtra, and Goa. Arunachal Pradesh, Assam and Sikkim in the North-east also have masculine SRBs. Appendix Table 1 shows a stark shift toward excess masculinity, with SRB values in the range of 107–118. The lowest abnormal values are 107 for urban Bihar, UP, and Goa, and the highest values reach 118 for urban Punjab and 116 for urban Haryana.

Appendix Table 1 shows that the all-India urban area SRBs now reach 108, reflecting the increase in masculinity of urban SRBs of many states. The Southern states' SRBs appear normal in both decades. The Lakshadweep Union Territory (off the Kerala coast) that had masculine SRBs in 1981 is in the normal range in 1991.

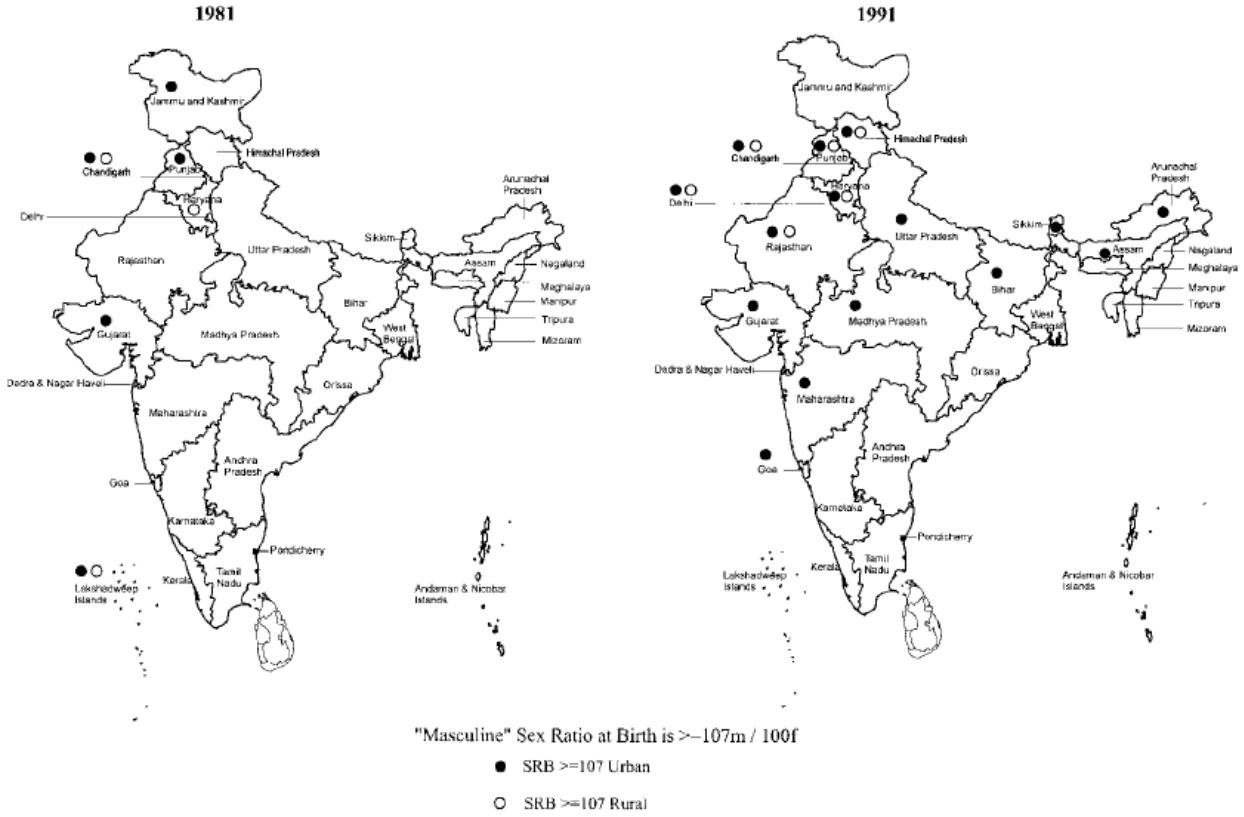

Figure 1. Spread of "Masculine" Sex Ratio at Birth, India, 1981–1991

For 1981, Appendix Table 1 shows some states (Andhra Pradesh and urban Tamil Nadu in the South; Manipur, urban Nagaland, Meghalaya and Arunachal Pradesh in the North-east; Madhya Pradesh, urban Orissa and rural Bihar in the Centre; Rajasthan and urban UP in the North/North-west; urban Dadra and Nagar Haveli) have SRBs that may be seen as 'feminine' (below 103). We speculate that this might be due to under-reporting of infants that might have been born alive but died shortly thereafter. They would not be enumerated, and would thus not show up in either the counts of infants, or the mortality statistics. Since neonate and infant boys have higher mortality than girls, boys may be over-represented in the uncounted children, leading to unusually feminine SRBs. In 1991, the phenomenon of excess femininity of SRBs has greatly lessened, now noted only in Dadra and Nagar Haveli, Nagaland, and rural Arunachal Pradesh, Manipur, Meghalaya, Andamans and Lakshadweep, and MP. This could be due to improved enumeration and tabulation, or lessening of male infant/child mortality due to the improvement in health facility coverage, or to the general country-wide trend toward the masculinization of SRBs.

We conclude that while SRB figures have grown anomalously masculine across several states, the numerical magnitude of the impact of sex selective abortion in India is not great as yet, at least according to these Census records. In East Asia, the impact of such practices amounts to

about 5 per cent of female births (Asia Pacific Population and Policy Report, 1995). In India, the impact is less than this. Since the 1991 all-India rural SRB was within the normal range, if we examine the change in all-India urban SRB from 104 in 1981 to 108 in 1991, and consider that an SRB of 106 is the upper bound of 'normal', then only 2 per cent of female births are affected. This translates to a shortfall of some 74,600 female births (all-India urban), mostly in the North-west zone. Since official records of induced abortion in India are notoriously flawed and incomplete, Mishra et al. (1998) have estimated the likely number of abortions occurring in India using National Family Health Survey data (1992–3). They show that the possible numbers of induced abortions for all-India were over 207,000. However, the fact that the numerical magnitude of sex-selective abortion as judged from Census records is not very great, does not diminish the gravity of the issue, for two reasons. First, since Census records are only picking up the 'tip of the iceberg' of this phenomenon, the reality is probably greater than the figures show. Second, even Census records indicate that the phenomenon is increasing over time, which is itself a grave cause for concern.

SPATIAL AND TEMPORAL TRENDS IN FEMALE DISADVANTAGE IN CHILD MORTALITY PROBABILITY

We examined evidence that prenatal sex determination and selective abortion of female foetuses occurred on an increasing scale in India during the decade 1981–91, in specific urban areas. We also reviewed studies and reports that female infanticide is spreading across the rural Indian spectrum. We now turn to the examination of sex-specific child mortality probabilities, to examine whether girl children in India continue to face heightened mortality risks *vis-à-vis* boys. In Appendix Table 2, we present sex ratios of under-5 mortality probabilities for children (q5) for 1981 and 1991, for each state, for rural and urban areas. Mortality ratios that indicate female disadvantage (i.e. male to female q5 ratio <100) are considered anomalous. Ratios that show male disadvantage are considered 'normal'. Figure 2, based on this table, maps the spatial and temporal distribution of female mortality disadvantage.

Figure 2 shows the spatial distribution of trends in mortality sex ratios across 1981–91, identifying rural and urban areas of those states with ratios showing female disadvantage. In 1981, all the Northern/North-western states (except Himachal Pradesh and urban Jammu and Kashmir) had excess female child mortality, in urban and rural areas. In 1991, all these areas continued to exhibit female mortality disadvantage, with the exception of Chandigarh, which along with urban Dadra and Nagar Haveli and Andaman Islands, were the only regions shifting to 'normal' female vs. male child mortality risks. Furthermore, in 1991, female mortality disadvantage appeared in areas that were `normal' in 1981, namely rural and urban Orissa, Goa, and Karnataka, and rural Tamil Nadu (in keeping with reports of female infanticide in that state). Thus, the phenomenon of excess female child mortality not only persisted over the decade, but also actually spread across more of India.

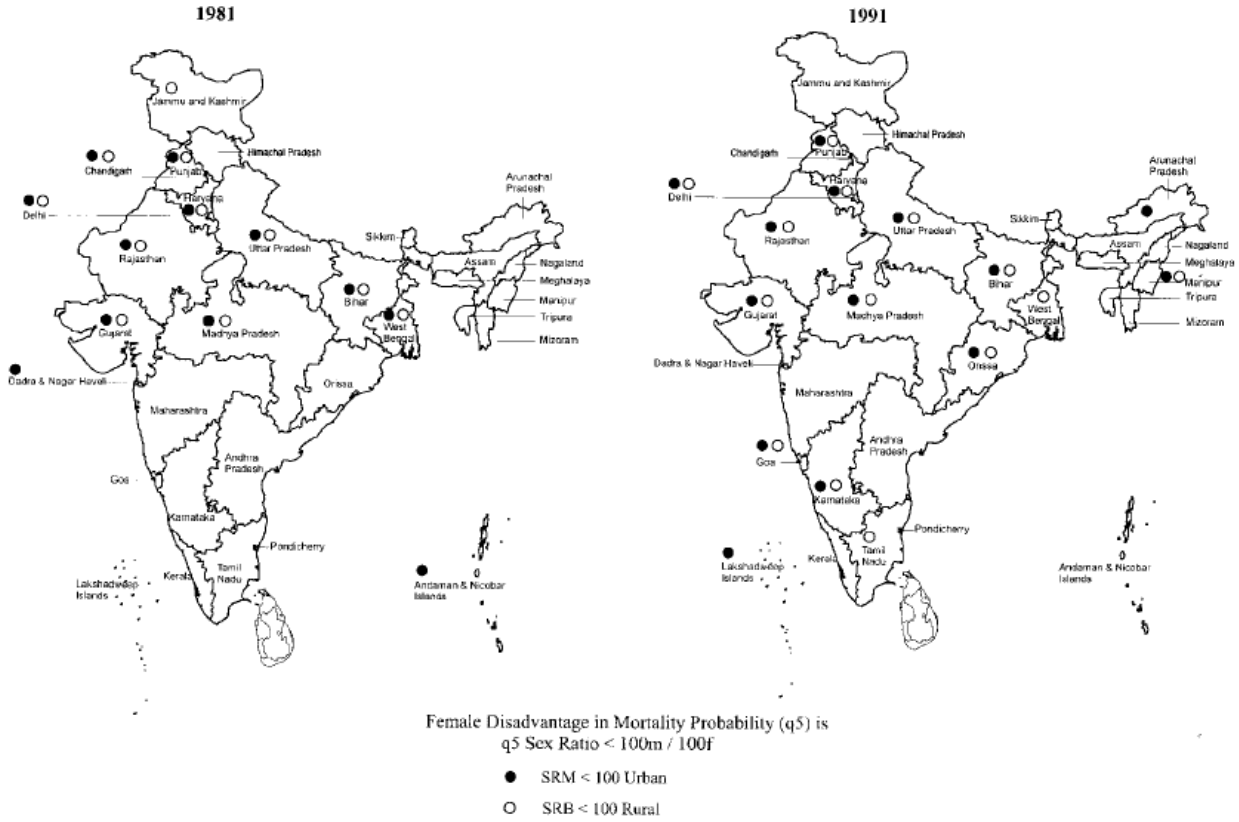

Figure 2. Spread of Female Disadvantage in Mortality Probability, India 1981–1991

Overall, levels of child mortality in India declined considerably from approximately 152 per 1000 (both sexes, all India) in 1981 (Government of India, 1988: 5), to 96 per 1000 in 1991 (both sexes, all India, in Irudaya Rajan and Mohanachandran, 1998, based on 1991 Census records). Appendix Table 2, however, shows that the sex ratio of mortality actually became more male-biased during 1981–91, indicating that mortality fell more for males than females, and that females still have higher mortality than males. Positive changes (i.e. lessening female mortality disadvantage 1981–91) are seen in only a few areas, such as Himachal Pradesh, the Union Territories of Delhi and Chandigarh, rural Punjab, urban Rajasthan, West Bengal, Mizoram, Dadra and Nagar Haveli and Andaman Islands. However, of these areas, only the small regions of Chandigarh, Mizoram, Dadra and Nagar Haveli and Andaman Islands show 'normal' male to female mortality risk ratios in 1991, the other regions still exhibit female disadvantage. Increasing female disadvantage appears in many North/North-western and Central states: rural Rajasthan, urban Haryana, all of UP, Bihar, MP, and Gujarat, which all had female mortality disadvantage in 1981. Orissa, which had 'normal' mortality sex ratios in 1981, shifts to female disadvantage in 1991. In South India, Karnataka, Goa, and rural Tamil Nadu also shift from 'normal' ratios to female disadvantage. Thus, substantial parts of India in 1991 exhibit persistent excess female child mortality, in keeping with research documenting persistent selective neglect of girls.

While the 1991 Census mortality figures for Kerala also indicate female disadvantage, infant and child mortality is generally so low in this state, that a small absolute difference between the sexes has translated into a large difference in the ratio in this case. Thus, in the case of Kerala, we do

not suggest at this time that excess female child mortality has suddenly emerged in this state, since, unlike Tamil Nadu, no study has identified this phenomenon here. This logic also applies to some Union Territories and states in the North-east, that indicate extreme values of the mortality sex ratios. Values in 1981, such as 152 for urban Meghalaya or 128 for urban Sikkim, are an artifact of small sex differences in low reported levels of mortality.

To contextualize the scenario of birth and life chances of boys and girls in India, Appendix Table 3 shows fertility trends in different regions of India 1982–94. This decade witnessed a moderate fertility decline in the country as a whole (20 per cent), from a TFR of 4.5 in 1982 to 3.5 in 1994 (SRS Reports). However, we observe dramatic declines in the South, such that Kerala now has below replacement fertility and Tamil Nadu is at replacement level, and Karnataka and Andhra Pradesh are below the national average. The Eastern states register moderate declines, as do Gujarat and Punjab. The other Central and North/North-western states record more modest gains.

The demographic picture that emerges for the period 1981–91 is one of all-India declines in fertility and mortality, worsening sex ratios of child mortality in many major states, and increasing masculinity of SRBs in the North/North-west, and in urban areas of some Central states. Prior studies showed that higher birth order females were at the greatest risk of mortality in Northern and North-western India (Das Gupta, 1987; Kishor, 1995). It is therefore argued that with declining fertility, the proportion of births of higher order would decline, lowering excess female child mortality overall. Since the mortality ratios have not shown lessening female disadvantage in the face of declining fertility, this contention is clearly not upheld. Furthermore, SRBs in the North/North-west regions indicate increasing sex selection to ensure that the greater proportion of babies born are of the wanted (male) sex. Thus, excess female child mortality appears combined with prenatal sex selection in a specific zone of the country — the North/North-west — to create a 'double jeopardy' for Indian daughters there, with increasing female mortality disadvantage in other regions that have 'normal' SRB patterns.

CONCLUSION AND DISCUSSION

The first point we highlight is the great need for suitable data to be collected and released in a timely manner by the Government of India. The decennial census does collect information on the number and sex of births in the enumeration year. Statistics on period SRBs for all parts of India could be directly furnished, removing the need for indirect estimation to illuminate this important question. In our findings, it should be kept in mind that the SRBs have been estimated based on the reported numbers of infants aged under 2 years, and thus may be affected by any under-registration of female births or female infanticide, though we argue otherwise.

However, even with indirectly estimated measures, there is a clearly marked shift toward increasing masculinity of SRBs in North/North-west India, and urban areas of Central India. This suggests the rising use of prenatal sex determination and sex selective abortion there. The studies and reports we summarize, and the spatial distribution of the SRB figures we present, indicate plausibly that prenatal sex selection techniques are being increasingly used in these regions. The trend initially began (as might have been expected for a medical technological innovation) in urban areas and spread out over time to the rural surroundings, especially concentrated in those regions of the country that have a socio-cultural history of disfavour toward women. As we saw,

in 1981, only urban areas of the North-western region had somewhat abnormal SRBs. By 1991, urban and rural parts of the North-west, and urban parts of Central regions, all had masculine SRBs, some with very high values. Since the increased masculinity is seen in urban areas, we cannot attribute the trend to increased under-reporting of girls, or rise in female infanticide, both of which are less likely to be successfully carried out in urban areas.

Some argue that increasing masculinity of SRBs could be caused by development, especially in the health sector, because improved health conditions provide better life chances to male foetuses that are by nature more frail and prone to die. The trend in many parts of India between 1981 and 1991 of SRBs moving from excess femininity to normal masculinity may be due to this factor. The intense masculinity in the North/North-west region is, however, a little difficult to attribute entirely to improved health. If improvements in health were mainly at the bottom of increasing masculinity of SRBs, then regions such as Kerala and urban areas elsewhere in the South would also have witnessed much more masculinity of SRBs than they have. We thus conclude that improved male survivorship is in itself an insufficient explanation for the temporal and spatial trend in sex ratios in India. Since, as discussed above, other alternative explanations such as female infanticide and under-registration of births are less likely in urban areas, the spread of prenatal sex selection is further implicated.

Evidence indicating women's increasing economic marginalization and greater socio-cultural devaluation underlines the contention that development in India has generally been to the detriment of women, and further research investigating how these trends are causally linked to female demographic disadvantage is needed. Families in India respond to developmental stresses by increasing discrimination against daughters, since this strategy fits with the matrix of choices deemed culturally acceptable, which are largely patriarchal in nature. Alternative strategies such as investing in girls' education, ensuring daughters' inheritance, and including females in the production process, are less considered. Resisting dowry pressures generated by a 'groom shortage' by marrying women to men their own age or younger, or leaving them unmarried, or finding a spouse of another caste or community, appear unthinkable. Despite gains in education, longevity, and income for some groups of women, large sections of Indian society apparently still consider daughters a liability, and may prefer to avert their birth. While infanticide in earlier eras had been confined to certain limited caste and geographical groups, neglect of daughters, female infanticide and foeticide now appear widespread in some parts of India, and have pervaded groups and classes where they were hitherto unknown (Adithi, 1995; Harriss-White, 1998; Jeffery et al., 1984). Selective neglect of daughters persists. In fact, the co-existence of female foeticide, infanticide, and selective neglect of girls renders the distinction between pre- and post-natal sex selection techniques invidious: the bias against girls is entrenched, and the choice of methods may depend on convenience rather than conscience. Some scholars have gone so far as to term the persistent and multi-layered bias against girls, as 'gender-cleansing' (Harriss-White, 1998).

However, while the aggregate statistics for 1981–91 indicate that pre- and post-natal sex selection methods co-exist in many regions, conclusions regarding additive rather than substitutive strategies should also consider whether some local differences are being obscured in the aggregate. A study of a rapidly urbanizing and changing rural area near New Delhi revealed that local parents of the Jat community had an ideal family composition of two sons and one

daughter, and thus formed the clientele of the flourishing local sex determination clinics. However, the subsequent infant/child mortality rates among their children did not reveal female disadvantage any more (Khanna, 1995, 1997). This suggests that a pattern of substitution is indeed occurring. More such micro-level studies would better illuminate whether within any region, some families use certain strategies and others follow other methods, or whether the same groups are indeed following both strategies. Future research should prioritize examination of demographic behaviour, development trends and policies in India from a gender perspective, and focus on the nexus between macro-level cultural and economic structures and micro-level household organization and strategies.

The contention that selective neglect or infanticide affect mainly higher birth order girls and that therefore the gender imbalance in demographic rates and indicators should decline with decreasing fertility and mortality is clearly not upheld in this study. Consider that if the Jat families in the study just referred to could actualize their desired family size and sex composition, the community would show a TFR of 3.0 and an SRB of 200! In fact, the ideational shift to controlled fertility that includes acceptance of modern means of contraception has, in India, also meant a growing societal acceptance of medical technologies surrounding conception, prenatal sex selection, and abortion. Abortion selectively directed against female foetuses is acceptable to large sections of society in the name of 'population control', or couples' greater reproductive choice. The secular societal trend that increasingly devalues female lives remains largely unquestioned.

The argument that an adverse sex ratio will lead to a shortage in the supply of women, which will drive up their value since demand will remain high, is also unconvincing. The sex ratio in India has been noted to be adverse to females, and more or less steadily worsening, since the first recorded Census of 1871. The population sex ratio of India declined from 972 females per 1000 males in 1901 to 929 per 1000 in 1991. In this same period, the status of Indian women has been steadily eroded, despite gains made in some sectors by some groups of women. A 'shortage' of women does not lead to their increasing valuation, but to greater restrictions and control being placed over them. The increasing intensity of violence against women in all domains of life is testimony to this. Scholars predict increased social unrest in China once the shortage of females to males of the appropriate ages in the marriage market is felt, as a result of the skewed SRB patterns there (Tuljapurkar et al., 1995). The same might be said for India.

The trend toward greater use of prenatal sex selection despite legislative proscription, combined with persistent female disfavour in mortality ratios, combines to produce a scenario that is not likely to improve in the near future. These demographic phenomena are themselves only symptoms of the worsening situation of women in the Indian socio-economic developmental context. Policy measures addressing women's societal devaluation have either not been implemented, as in the Central Government scheme proposed in early 1997 of cash subsidies to girl children in all families identified as poor; or have had very limited impact, as illustrated in Tamil Nadu state's cash subsidy schemes or 'cradle baby' schemes (George, 1997). NGO strategies to tackle infanticide or female devaluation range from the very long-term (consciousness-raising), to the confrontational (reporting suspicious female infant deaths to the police), to the ineffective (attempting to dissuade parents from infanticide). Examples of plans

that have successfully involved women and men in local development efforts are rare and recent, and their impact on demographic behaviour is as yet small.

Furthering the legislative drive against discriminatory practices, on 9 January 1996, the Indian Government announced a ban on the abortions of healthy female foetuses identified during permissible genetic tests. Under the new law, mothers, fathers, and doctors can all be punished with fines ranging from $300–$1500 and prison terms from three to five years, escalating for repeat offenses. Critics point out that women are rarely the primary decision-makers in the use of these technologies, and such legislation places a dual punishment on them. It is feared that women will be driven to seek terminations of unwanted pregnancies under illegal conditions, in a country where the majority of abortions are already reported to take place illegally. It remains to be seen how effective new legislative measures will be in reversing the trend of female foeticide, when past actions have not shown marked success. Our review of the literature suggests that any policy measures must not focus primarily on restricting technology used to women's detriment, but must also address the root causes of devaluation of Indian women, or they will not succeed in eradicating discriminatory practices but will drive them underground where they will continue to flourish.

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APPENDIX

Table 1. Sex Ratios at Ages 0 + 1, and Estimated Sex Ratios at Birth: 1981–91

	1981				1991			
	Sex ratio (M/F)				Sex ratio (M/F)			
	Observed ratio 0 + 1		Estimated SRB		Observed ratio 0 + 1		Estimated SRB	
State/Region	**Rural**	**Urban**	**Rural**	**Urban**	**Rural**	**Urban**	**Rural**	**Urban**
INDIA	103	104	103	104	106	108	106	108
North/Northwest								
Himachal Pradesh	105	105	105	105	108	113	109	114
Jammu & Kashmir	105	110	105	110	—	—	—	—
Punjab	107	108	105	107	117	119	117	118
Rajasthan	103	103	101	102	108	111	107	110
Haryana	109	107	108	106	114	117	113	116
Delhi (UT)	105	104	105	106	111	111	110	110
Chandigarh (UT)	112	103	111	107	110	109	110	109
Uttar Pradesh	104	102	103	102	107	109	106	108
Central								
Bihar	102	104	101	103	107	108	105	107
Madhya Pradesh	101	102	102	101	103	108	102	107
Gujarat	105	108	104	107	107	112	106	111
Maharashtra	102	101	106	105	103	108	106	109
Orissa	101	103	102	104	104	104	103	103
Goa	104	105	104	105	103	106	103	107
East/Northeast								
West Bengal	102	104	103	103	104	105	103	104
Assam	—	—	—	—	105	108	104	107
Mizoram	103	100	104	100	102	104	103	104
Nagaland	101	103	102	103	99	103	99	102
Meghalaya	102	104	102	104	101	103	101	103
Arunachal Pradesh	100	105	102	105	101	109	101	109
Tripura	105	104	106	104	104	104	104	104
Manipur	101	101	101	100	103	105	102	105
Sikkim	105	99	104	98	105	123	105	124
South								
Kerala	102	107	103	106	106	106	105	106
Andhra Pradesh	101	102	102	102	103	104	103	103
Tamil Nadu	103	102	104	101	105	105	105	105
Karnataka	102	104	103	104	105	105	105	105
Union territories								
Andamans	102	94	104	95	100	104	100	103
Lakshadweep	109	110	109	108	102	106	102	106
Dadra Nagar Haveli	98	100	99	103	101	94	101	101
Pondicherry	102	102	103	103	103	105	103	106

Notes: Any value above 107 can be considered 'excessively' masculine. The census was not conducted in Assam in 1981, or in Jammu and Kashmir in 1991.

Source: Censuses of India 1981 (Government of India, 1988); and 1991 (Government of India, 1991).

Table 2. Sex Ratios of Child Mortality: 1981–91

	1981		1991	
	Sex ratio of child mortality q5 m/f		Sex ratio of child mortality q5 m/f	
State/Region	**Rural**	**Urban**	**Rural**	**Urban**
INDIA	93	98	89	95
North/Northwest				
Himachal Pradesh	104	107	108	110
Jammu & Kashmir	97	102	—	—
Punjab	87	92	92	92
Rajasthan	89	89	85	90
Haryana	81	89	81	82
Delhi (UT)	85	95	89	96
Chandigarh (UT)	88	99	107	110
Uttar Pradesh	83	86	79	82
Central				
Bihar	87	90	72	79
Madhya Pradesh	96	98	92	92
Maharashtra	101	106	100	104
Orissa	103	101	93	86
Gujarat	92	94	80	82
Goa	106	103	96	91
East/Northeast				
West Bengal	99	99	92	152
Assam	—	—	103	108
Mizoram	107	111	113	116
Nagaland	106	132	100	107
Meghalaya	105	126	104	105
Arunachal Pradesh	106	152	104	91
Tripura	105	108	102	104
Manipur	104	103	90	94
Sikkim	120	128	110	106
South				
Kerala*	113	101	94	88
Andhra Pradesh	105	107	103	108
Tamil Nadu	101	104	88	100
Karnataka	101	102	96	97
Union territories				
Andamans	107	92	112	102
Lakshadweep	121	105	136	91
Dadra Nagar Haveli	113	97	133	136
Pondicherry	103	104	107	103

*See explanation in the text. For all other cells, any value <100 can be considered to indicate female disadvantage.
Sources: 1981: Government of India (1988); 1991: Irudaya Rajan and Mohanachandran (1998).

Table 3. Profile of Fertility Decline in Major States of India (1982–94)

	Total fertility rate (TFR)		
State/Region	**1982**	**1994**	**% decline**
INDIA	4.5	3.5	22.20
North/North-west			
Rajasthan	5.3	4.5	15.10
Uttar Pradesh	5.7	5.1	10.10
Haryana	4.9	3.7	24.50
Punjab	4.0	2.9	27.50
Central			
Bihar	5.6	4.6	17.90
Madhya Pradesh	5.3	4.2	20.80
Gujarat	4.2	3.1	26.20
Maharashtra	3.8	2.9	23.70
Orissa	4.3	3.3	23.30
East			
West Bengal	4.1	3.0	26.80
South			
Andhra Pradesh	3.9	2.7	30.80
Karnataka	3.6	2.8	22.20
Kerala	2.9	1.7	41.40
Tamil Nadu	3.3	2.1	36.40

Source: Government of India (1982, 1994).