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PRENATAL AND POSTNATAL SEX-SELECTION
IN INDIA: THE PATRIARCHAL CONTEXT, ETHICAL
QUESTIONS AND PUBLIC POLICY

by

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Abstract: In much of India, especially in the North, son preference is very strong. Newly available technologies now permit at least some families to express this son preference by sex-selective abortion. Son preference is also expressed by the neglect of daughters and the preferential allocation of key household resources to sons. This paper briefly describes the patriarchal context of rural North India which promotes son preference and daughter disfavor, and then presents information on prenatal sex-selection and postnatal sex-selection. The major ethical and public policy implications of both forms of sex-selection in India are reviewed in the conclusion.

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PRENATAL AND POSTNATAL SEX-SELECTION IN INDIA:
THE PATRIARCHAL CONTEXT, ETHICAL QUESTIONS AND PUBLIC POLICY¹

A strong preference for sons, resulting in the neglect of daughters, has been documented for rural northern India (Miller 1981). The patriarchal economy, the social structure, and the cultural framework all provide incentives for households to desire sons more than daughters. This paper examines two aspects of the expression son preference and daughter disfavor: prenatal and postnatal. Through sex-selective abortion, son preference may now be expressed prenatally. The option of selectively aborting daughters depends on the use of technologies only recently available. Son preference is also expressed postnatally by differences in child care between sons and daughters which may promote the survival and health of sons to the detriment of daughters. This pattern has a long heritage in North India, extending from the earlier practice of outright female infanticide to the current practices of sex-selective abortion and sex differentials in child care.

In this paper, I first briefly describe the patriarchal context of rural northern India. I next present some information on prenatal sex-selection in India and then a lengthy discussion of postnatal sex-selection whereby girls are more exposed to risk within the household than boys. In conclusion, I review the major ethical and policy questions surrounding both prenatal and postnatal sex-selection in India.

Introduction: The Patriarchal Context

"Patriarchy" is used throughout this paper to refer to what Divale and Harris (1976) have called the "male supremacist complex." Patriarchy involves hierarchical relationships between males and females with males receiving preference in most domains. Empirical measures of male supremacy include impaired health and survival chances for females. Patriarchy has existed and exists now to varying degrees throughout the world and among different social classes.

The preference for sons and disfavor toward daughters is a complex phenomenon that has tenaciously survived through the centuries in North India. Sons, especially in the rural North Indian context, are economic, political, and ritual assets; daughters in most respects are liabilities. Sons are needed for farming the land or, if they emigrate, are valuable sources of remitted income. Sons play important roles in local power struggles over land boundaries and rights to irrigation water. Sons often remain in their natal households after marriage and, thus, provide security for the parents in their old age. North Indian daughters marry out of their natal villages and can provide no support for their households of birth. Sons bring in dowries that often contain large amounts of cash which can be used by the parents of the groom; daughters drain domestic wealth by requiring dowries upon marriage and a constant flow of gifts to their families of marriage for years thereafter. Among Hindus, sons are also needed to perform important rituals, but daughters cannot perform such rituals.²

There is good evidence that, in British India during the eighteenth and nineteenth centuries, female infanticide was practiced by a large proportion of the North Indian population.³ According to a modeled estimate that I have developed, one-fourth of the population in the northwestern plains region allowed no daughters to survive while the remaining three-fourths of the population did nothing to alter the sex ratio of their offspring (see Miller 1981:61-65 and forthcoming). From the late nineteenth century onward, the practice of direct female infanticide abated under pressure of colonial rule but was supplanted by the practice of indirect female infanticide through the fatal neglect of female children. In rural North India, there is still a marked imbalance in the ratio of boys to girls, with district sex ratios for under ten-year-olds as high as 117 males per 100 females (Miller 1981). An increasing number of studies, both household surveys (Simmons et al. 1982) and hospital-based demographic surveillances (Cowan and Dhanoa 1983), document that mortality rates for girls greatly exceed those for boys in the North. In a carefully monitored study carried out in Ludhiana district, the Punjab, it was found that 85 percent of the deaths to children between the ages of seven months and thirty-six months were female deaths (Cowan and Dhanoa 1983). Most of the female deaths were related directly to malnutrition or to respiratory infections which are greatly aggravated by malnutrition.

Within populations characterized by strong son preference, a technology allowing prenatal sex-selection of offspring would be particularly attractive.⁴ Given the expressed preference for sons that still exists in North India, as in some other parts of the world, many families there would try to realize their preference if the technology to do so were readily available. Several years ago Williamson (1978) identified the use of amniocentesis followed by abortion as a means of avoiding the birth of daughters in Hong Kong. In the conclusion of The Endangered Sex (1981), I suggested that the development of a prenatal sex selection method would bring about the abortion of many female fetuses in India. Are these exaggerated reports and predictions?

Prenatal Sex-Selection in India

Several years ago a Jain woman in her sixth month of pregnancy came to Ludhiana Christian Medical Hospital for an amniocentesis test. The results of the test showed that genetic defects such as Down's syndrome or spina bifida were not present in the fetus. The test indicated that the fetus was female. The woman requested an abortion and was refused. She went to a clinic in Amritsar, another major city in the Punjab, and had the abortion done.

This anecdote was told to me by medical personnel at Ludhiana Christian Medical College in November of 1983 as part of an explanation of why Ludhiana CMC no longer performs amniocentesis. There were so many requests for abortion of female fetuses following amniocentesis that the hospital made a policy decision to not provide such services.⁵ Today a resident of Ludhiana who wants to abort a female fetus must take the train about 90

miles to Amritsar where the service is provided. An especially poignant aspect of the anecdote is that the woman was a Jain. Jainism supports nonviolence toward all life forms. Orthodox Jains sometimes wear cloths over their mouths so as to not mistakenly swallow a fly, and Jains do not plow the earth for fear of inadvertently cutting in half a worm. But the Jain woman in the anecdote was willing to abort a female fetus in the sixth month of gestation, so strong was the cultural disfavor toward the birth of daughters.

The issue of sex-selective abortion in India has attracted the attention of many Indian scholars, and there is a heated debate concerning the ethical dimensions of the practice.⁶ There have been magazine and newspaper articles written about it in India and some newspaper coverage has reached the United States press. Like direct and indirect female infanticide, sex-selective abortion must be understood and analyzed in its patriarchal sociocultural context, but it differs enough from female infanticide to merit separate examination.

The practice of sex-selective abortion raises several important questions. How can we estimate the extent of the practice? What are the social and economic characteristics of those families seeking to abort female fetuses? What are the demographic characteristics of the families seeking sex-selective abortion? I do not yet have the data to answer these questions, but some relevant evidence is available.

An article published in Social Science and Medicine in 1980 discussed the extent of the phenomenon with a study based on clinic records in a large city of western India (Ramanamma and Bambawale 1980). In one hospital, from June 1976 to June 1977, 700 individuals sought prenatal sex determination. Of these fetuses, 250 were determined to be male and 450 were female.⁷ While all of the male fetuses were kept to term, 430 of the 450 female fetuses were aborted. This figure is even more disturbing in light of the fact that western India is characterized by a less extreme son preference than the North.

There appears to be an eager market in India for sex-selective abortion, although the cost of the service still makes the procedure too expensive for the very poor. A report in Manushi (1982) states that the service is available in Chandigarh, the Punjab, for only 500 rupees.⁸ Another report mentions that the charge was 600 rupees at a clinic in Amritsar, the Punjab (Washington Post 1982). A recent visitor to Ahmedabad, Gujarat, reports a charge of only 50 rupees in a clinic there (Everett 1984). Whether the charge is 50 rupees or 500 rupees, the cost is minor for many households, especially compared to the future benefits gained from possibly having a son conceived at the next pregnancy and compared to the money that would have been needed to provide a dowry for the girl were she to survive.

Postnatal Sex-Selection

In North India, health care practitioners must take household gender preferences into account in health care programs targeted at children

because of the existence of sex-selective child care.⁹ The household is the institution where day-to-day decisions are made, more or less consciously, about resources that will affect the life chances of boys versus girls. In the absence of radical and widespread social change in India such that the worth of daughters would be considered equal to that of sons, community health measures must seek to equalize the life chances of boys and girls by understanding and altering child care patterns in the household.

This section of the paper proceeds from a review of the context of the Punjab to a discussion of how resource allocation patterns in the household differentially create risk factors affecting the health and survival of boys and girls. Societies where son preference is not present and societies where son preference is strong are compared.

Sex-Specific Risk Factors: Focus on the Rural Punjab

The wealthiest state in India is the Punjab, home of the Green Revolution in wheat which has brought increased prosperity to the area. The Punjab also possesses a well-developed, decentralized health care system and one of the finest medical colleges and hospitals in the country, Ludhiana Christian Medical College and Brown Memorial Hospital, located in Ludhiana City. But the Punjab continues to lag behind much of India in lowering its infant and child mortality rates. The IMR (Infant Mortality Rate or deaths per thousand live births to children under the age of one year) in the Punjab in 1975-1977 was 104, much higher than poorer states such as Kerala with an IMR of 52 and Jammu and Kashmir with an IMR of 66 (Dyson and Moore 1982; Mundle 1984; Miller 1985).

Infant and child deaths in the area are to a large extent, nonrandom. As noted previously, a study in the Ludhiana surveillance area revealed that, among deaths to children aged seven months to thirty-six months, 85 percent were female (Cowan and Dhanoa 1983). There are such clear patterns in the deaths that village-level health workers can spot with reasonable accuracy "high risk" children--usually high-parity daughters or any child born into a family that already has several sons and daughters.¹⁰ There are, however, many unknowns regarding intrahousehold risk factors related to these death patterns.

For nearly a decade, high quality demographic and social data have been gathered as a routine part of the community health care program initiated by Ludhiana Christian Medical College, now run in collaboration with the Government of India. In 1975, the CMC program started putting data on pregnancies, births and deaths, family characteristics, and events surrounding children's death and illnesses in three rural locations (Narangwal, Lalton Kalan, and Jamalpur) into individual Household Folders. At that time, there was no intervention program. In 1978 the community health care program began an intensive outreach project involving home visiting and Household Folders were continued for all households in the three locations. In 1981 CMC was asked by the Government of India to assume

community health responsibilities for the entire surrounding block of Sahnewal with a population of about 85,000.¹¹ By June 1981 data on pregnancies, births and deaths, and all other data for the Household Folders were being collected for the entire block. The basic data are gathered daily as village level health workers visit homes and update each Household Folder. Every month the health workers enter certain information in Master Registers kept at 49 village centers throughout Sahnewal block.¹²

Risk Factors

Separating various "risk factors" from one another is a difficult task, as is any attempt to measure their separate effects.¹³ Some factors, such as mother's age at marriage and mother's age at first birth, are closely interrelated. An important risk factor such as mother's health and nutritional status may affect other factors such as birthweight of the infant, which may in turn also be a function of other factors.

Risk factors must be distinguished from the immediate cause of death or illness which is often difficult to do on the basis of available data.¹⁴ An autopsy may reveal that a child died of measles, but the severity of the measles may well be related to impaired nutritional status of the child caused in turn by neglectful feeding because the child was female. Where a clinical condition such as measles interacts closely with a social factor such as systematic neglect, the difficulty of separation is extreme.¹⁵

I have assembled a list of the most important risk factors associated in the literature with infant and child health (Table 1). For this discussion, I ignore interdependencies but merely ask which factors would be able to alter sex patterns of mortality and morbidity. The risk factors are presented with my assessment of their potential sex-differential effects in societies with weak or no son preference and in societies with strong son preference. I made the assessments on the basis of informed logic, discussions about children's health patterns in rural Punjab, and an examination of some of the raw data from Ludhiana. The risk factors and the ratings merit a brief discussion here.

In Societies with No Son Preference

Much research on infant mortality has documented increased risks for infants born to very young and very old mothers, born to mothers who have already had several children (which interacts with age), and born within a short time after a previous birth. Along with these factors, the first birth is reported to incur greater risks, as is the last. In a society where daughters are desired as much as sons, these factors should have no effect on the survival of boys compared to girls.

Antenatal health care, which improves the health status of the mother, likewise should benefit both sons and daughters, and maternal desire would not vary by sex. If there is no birth attendant or there are other circumstances at birth that make the delivery difficult, the consequences

should not differ according to the sex of the baby. Low birthweight babies are at relatively high risk, regardless of their sex, in societies with little or no son preference. If twins are born and one is a girl and one a boy, all other things being equal, each child has an equal chance to thrive. Congenital birth defects are one area where slight sex differences may arise, since certain birth defects are sex-linked. Muscular dystrophy is one inherited disease that strikes male offspring and thus has sex-selective risks.

Depression in the mother, which has been documented as sometimes impairing attachment to the baby (Morley 1973:81), would not be related to the sex of the child, nor would breastfeeding problems. It is true that smaller babies may be weaker and thus less able to suck properly; it is also true that generally male neonates tend to weigh a bit more than female neonates and thus there may be a male suckling advantage.¹⁶ I have not seen any documentation of any survival function inherent in the size differential, however. As the infant grows into childhood, its feeding and care should produce no sex differences in ability to thrive. Likewise, factors in the wider social environment, including sanitation, health care infrastructure, maternal education level, and socioeconomic status of the household should have no sex-differential effects, according to current knowledge.

In Societies with Strong Son Preference

The assessments in strongly son-preferential societies differ greatly from those discussed above where only a single factor was shown to have a weak sex-differential effect (Table 1). Only five factors appear to clearly lack potential for creating sex differences in societies with strong son preference; two have weak effects. The others fourteen have strong effects.

The factors with no potential are lack of a birth attendant, hemorrhage or other birth complications, maternal education, sanitation facilities, and health care provisions. The lack of a birth attendant would not in itself differentially affect the survival of boys compared to girls; compensation for that lack, however, may be greater if the child is a male. For instance, if the child is male, greater effort may be made to get help from a knowledgeable older woman, but I lack documentation for this hypothesis. It is possible also that with birth complications such as hemorrhage, greater investments will be made to improve the health of the mother if she has borne a son, but I believe this possibility to be slim. Likewise, I can foresee no greater risk for girls compared to boys that would be created by the presence of maternal education programs, sanitation facilities, and health care provisions. In fact, these last three features might lessen health risks equally for both boys and girls. One report based on a large study in South India indicates, however, the increased availability of health care may be primarily utilized for boys, thus, creating greater sex-differentials in the health status of children than existed previously (Srilatha 1983). The presence of improved health services in this instance lowers the risk for both boys and girls, but to a greater degree for boys.

The risk factors which I assessed as having a weak potential effect on sex-differentials in survival are congenital birth defects and number of cows and buffaloes, which create a tetanus risk. The first of these, congenital birth defects, has the same effects on the survival of males and females as in a society where there is little or no son preference, but may be exacerbated by son-preferential culture in cases where the birth defect is slight. Greater efforts might be made to preserve males than females since a female with a visible defect will have very impaired marriage chances, whereas a male with a slight birth defect will have only slightly more difficult marriage chances than a normal male. In rural India, very few children, either male or female, with visible birth defects reach maturity, but those that do survive in North India are most likely to be males.

Tetanus injections are available at local health centers throughout most of India, but parents do not always avail themselves of free injections for their children. If parents in a highly son-preferential culture realize the value of tetanus immunization, it is likely that they will make a greater effort to take sons rather than daughters to a health center for an injection. This statement is conjectural at the present time as I have no data on sex ratios of children receiving various inoculations, but the sex ratio of children brought to health care centers in the Punjab for whether treatment is very high, i.e., preponderantly males are brought. Therefore, I rated the tetanus hazard as having a "weak" potential effect on creating greater risk for daughters than sons.

I have rated all the other risk factors as having a strong potential effect on sex-differential health of children. In the case of pregnancies to very young mothers, or first births in general, a son is most desired as a first child and will be most invested with care and resources. Nevertheless, a first daughter is not such a great disappointment as the second, third or fourth daughters. We need to analyze the Ludhiana data to determine the differences in health and survival between first-born sons and first-born daughters; surely, the differences will be less dramatic than between third-born sons and third-born daughters. Thus, I believe that the risk to first-born daughters is strong relative to that of first-born sons, but certainly not as strong as to higher birth order daughters, daughters likely to be born after the mother is aged 33 years.

The problem with children born to mothers above the age of 33 years is interesting and the analysis of the data will be revealing. There is a strong cultural rule in North India that grandmothers should not bear children (Mandelbaum 1974).

By the time a woman is 33 years old in many parts of rural India, her eldest son may be married and cohabiting, putting the 33-year-old woman in the position of potential grandmother. Medical personnel at Ludhiana CMC state very clearly that "grandmother's babies" never survive, no matter what their sex. Many women aged 33 years in North India, however, will not be at the end of their childbearing period. Reports from Ludhiana indicate a very

high risk for daughters born into large families, and a relatively high risk even to sons in families that already have large number of sons and daughters. Here the age of the mother interacts strongly with the family composition at the time of the child's birth. It is possible that a first daughter born to a mother over 33 years old who has only sons will be quite welcome and thus less at risk than a sixth son would be.

Short pregnancy intervals may exacerbate sex differentials in survival in complicated ways. If the index child is a low priority female and the previous child a high priority son, then the mother may continue to breast feed the son to the detriment of the daughter. A short birth interval may additionally reduce the daughter's chance for survival because the child at birth tends to be smaller and weaker and the mother may have less breast milk. In another case, if a high priority son is born following a low priority daughter, the daughter may be abruptly weaned at an early age. Again the short birth interval exacerbates the situation because, if the daughter had been three or four years old, the risk at weaning time would not have existed (she would have been weaned earlier) or would have been less severe. Short birth interval in isolation from cultural factors is not a powerful sex selective factor, but in combination with son preference, it can create a male survival advantage.

I rated antenatal health care as having strong potential influence. I reasoned that if the mother is given health care, better nutrition, and relief from onerous work loads, and if her child is of high priority, then the interaction between her health status and cultural preferences will largely be to the advantage of male survival. Of course, if her child is a daughter the status of the infant at birth would benefit as well so that antenatal health care can be seen as having some mitigating effects on sex differentials.

The maternal desire for a child is an important psychological factor that may affect the survival status of the child. In societies where son preference is not strong, maternal desire does not depend on the sex of the child. In patriarchal North India, however, maternal desire for a son is generally extreme and is reinforced by incentives affecting the entire household. As a risk factor, maternal desire should be translated into household desire since the health status of the child is intricately interwoven into household preferences which may even override maternal preferences.

A low birthweight baby is always at greater risk than a larger baby, and if the baby is a low priority baby, then the risk is compounded. We do not yet have answers about the differential survival rates between low birthweight boys and girls, but a North Indian family would certainly go to extra lengths to protect the life of a low birthweight male child whereas, for a low birthweight female, it would not bother. Ironically, such extra lengths in Punjabi villages in Ludhiana sometimes result in dangerous overprotection such as a resort to bottle feeding for a weakly-suckling infant. Inevitably, as reported by medical personnel at Ludhiana, bottle feeding results in the child's death through improper sterilization.

Cases of surviving twins, and especially surviving twin females, are rare in India. Breast milk is allocated to preferred infants and, in the case of mixed sex twins, it is nearly inevitable that the boy will fare better than the girl. Twinship in many cultures is a risk factor (Morley 1973; Granzberg 1973), with any twins born being vulnerable to infanticide. In son-preferential cultures, twinship is compounded by gender to the detriment of female twins.

Puerperal depression can occur in any culture, but in a son-preferential culture it could occur more frequently upon the birth of a daughter. Again, we have no data on the incidence of depression after the birth of a son compared to a daughter, but it seems a logical consequence. In rural North India, after the birth of a son there is loud fanfare and celebration with feasts and music.¹⁷ The word is sent out that a son has been born and auspicious leaves are hung over the doorway to proclaim the good news. On the birth of a daughter there is silent disappointment. A woman who bears a son gains status in her husband's family; a woman who bears only daughters is regarded as little better than a sterile woman, and her husband may take a second wife. If we consider that a woman's household status and her future security, which comes from her sons, depends on the sex of her child it is not difficult to infer serious disappointment and "depression" on the birth of a daughter.¹⁸

Such depression ties in closely with ability to breastfeed successfully (Morley 1973). Contrary to uninformed opinion, successful breastfeeding does not always occur automatically. It requires psychological ease on the part of the mother and also support and advice from more knowledgeable women (Raphael 1973). Such support and assistance will not be given as readily to a mother who has just borne a low priority daughter as to a new mother of a precious son. If breastfeeding is not established early on, the difficulties increase as the child becomes weaker and fretful, the mother's breasts engorge, and the mother is less and less interested in trying to feed a nonresponding child. In the words of Western child developmentalists, "synchrony" in feeding is lost and will be difficult to reestablish.

If the infant survives its early weeks of life, the next critical period is around the age of six months when supplementation to breast milk is needed because its quality and quantity diminishes in respect to the growing child's needs. Medical personnel at Ludhiana report great difficulty in getting mothers to supplement the diets of low priority children, generally females. They have found that the best solution is to ask mothers to break up a bit of chapatti (wheat flour bread) and mix it with tea brewed with milk. This procedure requires the mother to do little extra; she need not purchase anything that would not be in the house already nor prepare anything special. To ask that something special be done for a low priority child is futile. A hypothesis worth investigating concerns work patterns of mothers after they have borne high priority sons compared to low priority daughters. It may be that mothers of daughters are more willing to work in the fields than mothers of sons, and such work would reduce their capacity to breastfeed satisfactorily.

I have documented elsewhere some care and feeding differentials for boys and girls in North India (Miller 1981). It is now very clear that in North India most sons receive more and better food in the household than most daughters. In Ludhiana, boys are rarely left uncared-for in the house if the mother goes to the fields to work. It is also clear that boys receive more and better medical care. The hospital in Ludhiana cannot fill its girls' ward, but the boys' ward is well-attended. This pattern does not result from more boys than girls being ill but from more parents being willing to take their boys to the hospital for treatment.

A study of 911 children in their second and third years in the Ludhiana area, showed that second and third degree malnutrition was distributed very unequally between boys and girls (Cowan and Dhanoa 1983). The overall percentage of malnourished children was lower among the privileged castes, but the sex disparity was greater (Table 2). Further research on the larger population monitored in Sahnewal block will show whether this pattern holds true generally.

Measles and colds strike children of both sexes equally, but the seriousness of the infection, as with most childhood diseases, is a function of the nutritional status of the child (Morley 1973). This truth is especially meaningful in the case of childhood diarrhea from which most childhood mortalities in developing countries result (Behar 1974, Jelliffe 1968, Scrimshaw et al. 1968). Son preference acts to improve the nutritional status of boys compared to girls. Thus infectious diseases, including bacterial infections and viral infections such as colds, will be less dangerous to the health status of boys than girls.

The effect of household socioeconomic status on sex differences in mortality and morbidity of children is not completely clear. In my earlier work (Miller 1981), I stated that differentials would be greater in North Indian propertied castes and classes since the son preference/daughter disfavor complex makes the most economic sense among such groups; daughters are a household burden because of the large dowries required for their marriage and they are a burden to the agricultural economy which relies much more on male labor power than female labor power. In lower castes and classes, large dowries are not generally required (though the practice of giving dowry is spreading among these groups), and women are more often economic assets to the household because they work for wages.¹⁹

Recent data on caste/class differences in children's health and survival are not conclusive. For the Punjab, Cowan and Dhanoa's research (1983) on the Ludhiana data implies significant sex differentials in nutritional status of boys and girls in both "privileged" and "under-privileged" castes, but the mortality patterns have yet to be examined. Preliminary reports from a study in Chandigarh, also in the Punjab, reveal that higher castes have a greater sex differential in infant mortality than the lower castes (Rush 1983). I have rated the effect of household socioeconomic status as strong, meaning that in upper, propertied castes and classes the survival disadvantage to girls will be more significant than in lower castes and

classes, but we need more data on this question for all over India. In terms of nutritional status of the survivors, the sex differential may be less in propertied than unpropertied groups because parents tend to take better care of the girls who are high priority children, and they may have more resources (but see the ratios of malnourished males to females in Table 2).

Ethical and Policy Dimensions

In the case of prenatal sex-selection, the ethical debate in India provides insights about how one very important society is reacting to the present and potential demand for technology and services which enhance the likelihood of having sons. The public policy ramifications are widespread; what stand should the government take concerning the legality or even availability of sex-selective technologies? Somewhat different is the situation with postnatal sex-selection in India. The ethical issues surrounding postnatal sex-selection are less discussed in newspapers and magazines in India. The public policy issues are also different since the provision of technology or clinical services is not involved. Intrahousehold allocation dynamics are the mechanisms through which daughters are selected against postnatally in rural North India, and no laws or public regulations can effectively alter such processes.

Prenatal Sex-Selection: Ethics and Policy

Amniocentesis and abortion are increasingly available throughout the world. A recently-developed test now can provide information on the sex of the fetus even earlier in gestation than amniocentesis, enabling sex-selective abortion in the first term.²⁰ Although this new technology will not be available to Asian villagers in the immediate future, the transmission of reproductive technology is rapid and the ethical and policy implications of such new technology are urgent.

In the West, ethical debates on abortion, and particularly abortion based on genetic screening, centers on whether and at what stage the fetus becomes a human being, whether or not the fetus feels pain, whether an individual with genetic "defects" would be able to lead a satisfactory life, and whether abortion is killing or whether it is simply "letting something die that could not have lived anyway."²¹ Much of the discussion to date concerns the human rights of the fetus as an individual. Relatively little emphasis is placed on the consequences to society of selecting out certain individuals.

In India, by contrast, the debate focuses on sex-selective abortion and its social consequences. Several writers have placed the controversy in the social context of son preference in India and have suggested the need for deep-seated change that would alter parents' views about the value of sons over daughters. Some writers identify the dowry problem as the single key, while others discuss a complex of factors related to son preference and daughter disfavor (Narayan 1982; Kumar 1983; Mohan 1982; Christian Science

Monitor 1983). Concern has been expressed by women's organizations and feminists to ban sex-selective abortion (Hariharan 1982; Balasubrahmanyam 1982). Others suggest that female feticide, while undesirable, may be preferable to female infanticide or to fatal female neglect (Kumar 1983). Related issues discussed in this context are the population problem in India and the knowledge that removing excess females from the population helps to reduce population growth. Still others point to the potentially negative consequences of many more males than females in the population such as social unrest. Little attention is directed to the question of whether a female fetus is less human than a male fetus, but it is recognized that, to many Indian families, a female fetus is a less valuable potential human being.

Another level of the ethical question in India involves the "little traditions" of ethics which guide the decision-making of those who opt to abort a female fetus. We know little about how various household members involved in abortion decision-making perceive the rightness or wrongness of sex-selective abortion. Sex-selective abortion, as contrasted with indirect female infanticide, involves a conscious decision to select against female offspring. One recent study, which consisted of a few interviews with women who sought sex-selective abortion, revealed little in the way of "remorse" but rather "fear" that they might bear a daughter instead of a son (Mohan 1982).

There are in India four major parties involved in the selective abortion dilemma: the unborn fetus, the household, special interest groups that seek to represent the rights of the unborn fetus, and the state. These parties may have different and conflicting perspectives on the rightness or wrongness of either preserving or ending the life of the fetus before birth. Currently, it seems that the major conflict is between the household and the state, both in terms of state concerns and goals about the "quality" of its population (that is, a balanced versus unbalanced sex ratio) and in terms of the state's responsibilities for financially supporting or even allowing the existence of abortion services. The central government has denounced sex-selective abortion, and abortion in general is illegal unless the mother's physical or mental health is endangered by the pregnancy. Government hospitals can no longer perform sex-selective tests and abortions, but independent clinics have sprung up and continue to exist in spite of various states' attempts to limit their activities. Given the apparent demand for these services, clandestine private clinics would surely spread if state laws against amniocentesis and sex-selective abortion were passed and enforced.

These questions--the true extent of the demand, and what would happen either if services were widely available and cheap or if there were no services at all--are areas of speculation, and our lack of knowledge is growing as fast as reproductive technology proliferates new possibilities. Continuing advancements in reproductive technology that bring prenatal sex-selection nearer to the time of conception will challenge the usefulness of current ethical and policy pronouncements.

Postnatal Sex-Selection: Ethics and Policy

Literature concerning the ethics of postnatal sex-selection in India comparable to the literature in prenatal sex-selection does not exist. Perhaps it is easier for writers who deal with ethical issues to confront the dilemmas surrounding a decision-making act, such as whether to abort or not, than with a gradual process such as the sustained neglect of daughters.

Elsewhere (Miller forthcoming) I have discussed the "altruistic" world view of many Western social scientists which probably also motivates the "health care for all" approach of community health care programs in India. This world view, which insists on equal life chances for all people in spite of the universal failure to provide for such equality, stands in direct conflict with the rural North Indian patriarchal world view which generally values sons' health more highly than daughters' health. I will not repeat that presentation, but will point to the problematic ethical area in which Western values about gender equality are labeled ethnocentric by some and are seen as being forced on the developing world. The reader who is interested in this issue should consult Schrijvers (1985) for a very illuminating discussion of issues surrounding feminist research on women and development in Sri Lanka.

The public health policy aspect of postnatal sex-selection involves several important questions. First, can a health care program seeking to provide equal health care for all be successful working within a patriarchal system? There is controversy about the impact of health care programs in alleviating sex differences in child survival in patriarchal cultures. Some say that a simple increase in health care services will improve the situation for girls (Minturn 1984); others have found that increased services will be diverted to priority children, i.e., boys, and that girls will benefit only secondarily (Srilatha 1983). Cowan and Dhanoa note that one important result of their intensive home-based visiting approach in the Punjab is the reduction in percentage of deaths to female children (1983:354). Two questions arise from this finding. First, the increased survival of "unwanted" girls brings with it an increase in the percentage of malnourished girls. That is, girls' lives have been saved, but the quality of their lives may not be at all equal to that of their brothers. How much more intensive must home visiting be to overcome this problem?²¹ Second, the cost of saving the life of a low priority female child must far outweigh the cost of saving and improving the life of a priority male. We have not figured unit health care costs by sex and household priority, but such an analysis would be very revealing. The time may not be far off when, with fiscal stringency the watchword of the day, the cost of extending intensive health care for girls becomes an impediment to programs such as the one at Ludhiana CMC.

Two arguments can be developed to counter policies which would limit special efforts to equalize life chances between boys and girls. First, one might look to the broader social costs to society when the sex ratio is seriously unbalanced. It cannot be proved beyond a shadow of a doubt that

unbalanced sex ratios lead to social disturbances, but there is much cross-cultural evidence pointing to that conclusion (Divale and Harris 1976). A balanced sex ratio does not guarantee social tranquility, but it might be a step in the right direction of repairing one of society's rupture lines. Second, in strongly son-preferential cultures, women bear many children in their attempt to produce many sons. The system of selective care which promotes son survival to the detriment of daughter survival is built on "over-reproduction." Mothers as well as unwanted daughters bear a physical burden in this system. The Ludhiana program seeks to keep children alive and wanted and to promote family planning after a certain number and sex composition of children have been born in a household. The possible reduced social tension from more balanced sex ratios and healthier mothers and children are certainly ends worth striving toward and worthy of substantial financial investment.

NOTES

1. My thinking on this subject has been supported by grants from the Wenner-Gren Foundation for Anthropological Research, Inc. The first section of this paper was presented at a panel on "Child Treatment and Child Survival: Cultural, Bioethical, and Applied Dimensions" at the annual meeting of the American Anthropological Association, Denver, Colorado, 1984. I am grateful to Nancy Scheper-Hughes for organizing the panel and for providing invaluable comments on my paper. A grant from the Wenner-Gren Foundation for Anthropological Research, Inc., #4454 funding allowed me to visit Ludhiana Christian Medical College, Punjab, India in November 1983. I gratefully acknowledge the generous assistance I received in Ludhiana from Dr. Betty Cowan, Principal of CMC Ludhiana, Dr. Jasbir Dhanoa, Dr. H.N.S. Grewal, and Dr. R.K. Sachar. A briefer visit to Vellore Christian Medical College in Tamil Nadu provided important insights on the very different context of South India. My time in Vellore was made useful by the help from Dr. P.S. Sundar Rao, Chief of the Biostatistics Department and Dr. K.V. Srilatha of the Rural Unit for Health and Social Assistance. I am also grateful to Dr. David Rush of Albert Einstein College of Medicine, New York who first put me in contact with Dr. Betty Cowan. Sections of the latter half of this paper were included in an earlier version, "Son Preference as a Key Determinant of Sex-Selective Death and Disease among Children in India," presented at the 83rd annual meeting of the American Anthropological Association, Denver, CO, November 1984.
2. An expanded discussion of the dynamics of son preference in India can be found in Miller (1981), and a comparison between Pakistan and Bangladesh in Miller (1984). Among Hindus, one daughter is highly desired because it is good for a father to give a daughter away in marriage. According to the scriptures, kanya dan, or the gift of a virgin in marriage, is one route to salvation.
3. For a fuller discussion of the practice of outright female infanticide in India see Miller (1981: 49-67).
4. I am skirting major theoretical issues which have import for speculations on any future patterns of resort to sex-selective abortion in India.
5. The central government of India has banned prenatal sex determination tests in government hospitals throughout the country for the same reason.
6. Examples include Illustrated Weekly of India (1982), Harihan (1982), Mohan (1982), Narayan (1982), Kumar (1983), Bardhan (1982), Balasubrahmanyam (1982), Indian Express (1982).
7. The preponderance of females in the sample is probably due to sheer accident.

8. In 1984-85, one U.S. dollar equalled approximately twelve rupees.
9. Increasingly, public health specialists are realizing that programs operating in isolation from, or ignorance of, household dynamics will be less successful (see Rush 1984).
10. Parity refers to birth order; high parity in the Indian context implies third, fourth, etc., births.
11. A block is an administrative division comprising an average population of 100,000.
12. Two physicians and I have developed a plan to abstract relevant data from the Master Registers on all births and deaths up to the age of three years, and then to obtain details on the children who died from the individual Household Folders (also kept at the 49 centers). The children will be divided into three groups following the main phases in the development of the CMC community health program: pre-program births in 1975, 1976, 1977; early-program births in 1978, 1979, 1980; and developed-program births in 1981, 1982, 1983. We hope to keep the study going through 1986 to complete the 9-cohort analysis. We began preliminary data abstraction early in 1984 but our efforts were interrupted by the violence in the Punjab, and the unsettled situation there continues to impede our efforts. I am hopeful that conditions will improve in the near future and that our work will be able to go ahead. This paper presents some data from the Ludhiana area analyzed earlier by Dr. Betty Cowan and Dr. Jasbir Dhanoa and some analyzed by myself in a pilot exercise I undertook in November 1983. It also presents perspectives and insights I gained through interviews and discussions with medical personnel and side visits to local health centers.
13. For a fuller discussion of these important interactions, see Population Reports 1984:J-676).
14. A similar difficulty is mentioned in Fortney et al. (1984) in their analysis of causes of death to women in Egypt.
15. I had a very interesting conversation with Dr. Betty Cowan of Ludhiana CMC concerning how we would address the question of cause of death. She insists that only clinically trained persons can make a diagnosis concerning the cause of death, and without an autopsy, or at least a "verbal autopsy" from someone who was present when the individual died, cause of death can only be inferred, never known. Thus, if our neonatal mortality data were to reveal a significantly high number of female deaths at or near the time of birth, she would be reluctant to assume that such deaths were "infanticides." We are working on categories that will differentiate immediate cause of death (such as suffocation) from underlying factors (such as unwanted daughter, smothered at birth), from

broader culturally determined risk factors. Some of the records note a "cause of death" such as "gross neglect--infant fell in pond and drowned." In fact, the child died from drowning, with the underlying factors involving neglect. In many mortalities we have "verbal autopsies" recorded by a health center physician who was called in after the death and interviewed the mother about the death. In all cases, the Household Folders' contain a separate card for each child with information on the child's age, weight, arm circumference, illness history, etc. In the case of neonatal deaths, and particularly of neonatal deaths that occurred outside the block, very little will be recorded beyond the reported sex of the child and date of birth and death.

16. In developed countries, male infants (under one year of age) have a slight survival disadvantage. The sex ratio at birth is about 105 males per 100 females; by the end of year one, the sex ratio is generally balanced.
17. See the review of this topic in Miller (1981:85).
18. An insightful discussion of how the desire for sons affects relationships among women in rural North Indian extended families is provided in Hyde (1984).
19. A good study of a low caste community of sweepers in Banaras which documents the economic importance of women's wages in the family is Searle Chatterjee (1981). Houska (1982) reports on the relatively equal treatment of sons and daughters among a low caste community in Allahabad.
20. The procedure is called chorionic villi sampling and can be done during the first eight to ten weeks of pregnancy. Information on the genetic configuration of the fetus is available the same day the test is performed.
21. Some examples of the Western literature include Tooley (1983) Grover (1977), Kohl (1978), and Horan and Delahoyde (1982).
22. I do not have information at this time on staffing levels in the program or workload of village-level personnel who do the home visiting, but my impression is that Ludhiana's community health care system cannot absorb much higher workloads as it is presently staffed.

TABLE 1

RISK FACTORS AND THEIR ESTIMATED POTENTIAL FOR AFFECTING
SEX-DIFFERENTIAL MORTALITY AND MORBIDITY

<u>Risk Factor</u>	<u>Societies with Weak or No Son Preference</u>			<u>Societies with Strong Son Preference</u>		
	<u>Potential</u>			<u>Potential</u>		
	<u>Strong</u>	<u>Weak</u>	<u>None</u>	<u>Strong</u>	<u>Weak</u>	<u>None</u>
Pregnancy before mother age 18 years			X	X		
Pregnancy after mother age 30 years			X	X		
Pregnancy after four births			X	X		
Pregnancy less than two years apart			X	X		
First birth			X	X		
Last birth			X	X		
Antenatal health care			X	X		
Maternal desire for child			X	X		
Lack of birth attendant			X			
Hemorrhage, other birth complications			X			X
Low birthweight baby			X	X		X
Congenital birth defects	X				X	
Twins			X	X		
Puerperal depression			X	X		
Breastfeeding problems			X	X		
Maternal education			X			
Sanitation facilities			X			X
Health care provisions			X			X
Episodes of infectious disease			X	X		
Household socioeconomic status			X	X		
Number of cows and buffaloes (tetanus hazard)			X		X	

SOURCE: The list of risk factors was gleaned from Morley (1973), Lilienfeld (1976), DaVanzo et al. (1983), Population Reports (1984), Phillips and Mozumdar (1984), De Sweemer (1984), Omran and Standley (1976), Puffer and Serrano (1973), and Serour et al. (1981).

TABLE 2

PREVALENCE OF 2nd/3rd DEGREE MALNUTRITION IN 911 CHILDREN
IN SECOND AND THIRD YEAR OF LIFE,
LUDHIANA, THE PUNJAB

	<u>Number</u>	<u>Sex Ratio^a</u>	<u>With 2nd/3rd Degree Malnutrition^b</u>	<u>Ratio of Male to Female Malnourished</u>
Privileged Males	231		2	
		111.0		1:6.5
Privileged Females	208		13	
<hr/>				
Under-Privileged Males	244		11	
		102.5		1:2.6
Under-Privileged Females	228		29	
<hr/>				
TOTAL	911	106.5	55	1:3.2
<hr/>				

^aSex ratio refers to the number of males per hundred females.

^bThe numbers in this column were read from a graph and may be off by a small margin.

SOURCE: Figure 5 in Cowan and Dhanoa (1983:352).

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