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Female sterilization and ethical issues: The Indian experience*

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In view of the prevalent gender norms that rationalize the bargaining power of women, lack of informed choice and high infant as well as child mortality, female sterilization as a family planning measure in India raises questions that need urgent attention in the broader context of individual freedom and human ethics. Data from the District Level Household Survey-Reproductive and Child Health (2002-04) covering a nationally representative sample of 507622 currently married women aged 15-44 years has been used for the present analysis. Bivariate and multivariate analyses have been performed to identify the factors associated with female sterilization acceptance within the broader framework of ethical issues. Although about one-third of Indian women use female sterilization as a method for regulating fertility, analysis reveals that people from different socio-economic, religious and demographic strata do not generally opt for sterilization in equal proportion. Informed choice has found to be very poor among women and so also the quality of available services. The need of the hour is to offer choice and quality services. Besides sensitizing the providers about the importance of ethical issues, government need to think over improving information education and communication, better quality services, and importance on spacing methods.

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INTRODUCTION AND CONTEXT

India has the unique distinction of being the first country in the world to introduce a nationwide family planning programme in the early 1950s. Since its inception, the family planning programme has witnessed many stages and approaches. However, the very notion of population control and the way the programme has been implemented in India has failed to address the ethical issues allied with the programme at large. Questions have risen at the government level at different points of time over a range of issues starting from quality of services to negligence of individual rights for fulfilling the national goals. Nonetheless, female sterilization continues to be the largely adopted family planning method in India.

The initial approach of the Indian family planning programme was basically clinical with the expectation that people would visit them for the services when in need, the failure of which led the government to switch over to the extension approach in the early 1960s, thereby taking the programme to the people through an extensive network of primary health centres in rural areas and family welfare centres in urban areas (Srikantan and Balasubramanian 1983). With the introduction of method-specific targets to reduce the continuing high birth rate in the mid 60s, achievement of contraceptive targets rather than clients' services became the major objective of the public providers (Narayana et al. 1998). By 1969, the family planning programme was fully integrated with the maternal and child health (MCH) programme that advocated a cafeteria approach, but in practice the choice of the methods and the emphasis remained mainly on sterilization(Srinivasan 1983). It has been found that contraceptive targets and cash incentives have resulted in the inflation of performance statistics and the neglect of quality of services (GoI 1996). With the failure of IUD as an acceptable method, once again the programme underwent with a shift in emphasis towards sterilization camps for carrying out vasectomy operations during 1969-74.

The programme reached the extreme during the national emergency (1975-77) with massive sterilizations especially vasectomies carried out in most unorganized and hazardous ways. People were either lured or forced to undergo sterilization against their will (EPW 1977; Gwatkin 1979; and Hartmann 1995). The civil liberties were suspended and the unsterilized couples were threatened with fines and imprisonment besides exemption from government facilities (Panandiker *et al,* 1978; and Hartmann 1995). In a one-year period (1976-77) about 8.2 million people were sterilized, remarkably higher than the previous years (GoI 2001). With the end of

the emergency and fall of the then government, the family planning programme at the beginning of the 1980s was renamed as family welfare programme embarking on a shift in the focus towards tubectomy. Large-scale post-emergency resistances to vasectomy besides greater promotion of tubectomy have been cited as some of the reasons (Basu 1985). Since then, female sterilization continued to hold the central place in the Indian family welfare programme. However, the coercive policy of the government continued even during the post-emergency period and the programme has often been accused of using unacceptable ways to indulge people to be sterilized to fulfil the administrative targets (Caldwell *et al,* 1982; and Pettigrew 1984).

Mounting national as well as international criticism besides the ICPD programme of action (POA) suggesting the family planning programme to go beyond method specific targets and pay attention to the need of the individuals, especially of women, have led the government (one of the signatories of ICPD) to replace the 'target-oriented approach' with 'target-free approach' also known as 'community need assessment approach' (CNA) in 1996. Presently, the family welfare programme works under the broad umbrella of 'reproductive and child health' (RCH) programme. To sum up, various approaches and techniques such as clinical, extension, cafeteria, integrated, camp, target and target-free have been developed and implemented to increase the acceptance of family planning. Nevertheless, it appears that the sterilization, especially female sterilization continues to remain the most emphasized and perhaps the most popular method of family planning in India.

Past studies reveal that age (Zavier *et al,* 2005), age at sterilization and parity of the woman (Jamshedji and Pachauri 1980; Reddy 1984; Dharmalingam 1995; and Iyenger and Iyenger 2000), sex composition of the living children (Reddy 1985; Rajaretnam and Despande 1994; Malhi and Jerath 1997; and Arnold *et al,* 1998), education (Anand 1984; Gulati 1996; and Govindasamy and Ramesh 1997), standard of living of the household (Kapil *et al,* 1989; IIPS 2000; and Pal and Makepeace 2003), religion of the household (Bhagat and Praharaj 2005; Kulkarni and Alagrajan 2005; and Maribhat and Zavier 2005), caste of the household (Rupert *et al,* 1992; and Ramesh *et al,* 1996), and place of residence of the household (Ross et al. 1985 and Ramesh *et al,* 1996) as the important factors affecting female sterilization. Some other studies opine that type of family (PRC 1995), couple's level of aspiration (Singh and Gupta 1983), exposure to mass media and occupation of the woman (IIPS and ORC Macro 2000) besides attitude towards family planning (CORT 2000) play

a decisive role in female sterilization acceptance. Indian women are hardly consulted in household decisions (IIPS and ORC Macro 2000).There is further evidence that many acceptors of female sterilization face health problems following sterilization (IIPS and ORC Macro 2000) and many regret their decision (Zavier and Nair 1998; and Ramanathan and Mishra 2000). Again, in India mortality during infancy and childhood is higher than many other nations (UN 2005) and rural communities where child mortality is high and women's autonomy is low suggests that women may seek reversibility in a contraceptive even if they have finished child bearing (Iyenger and Iyenger 2000). Additionally, the family planning programme has often been credited with poor quality of services and poor counselling (Mavalankar and Sharma 1999; Ramachandar and Barge 1999; and Foo and Koenig 2000).

In view of the prevalent gender norms that rationalize the bargaining power of women, high infant and child mortality, poor quality of services, and lack of informed choice besides large-scale sterilization regrets, female sterilization as a family planning measure in India poses questions that need urgent attention in the broader context of individual freedom and human ethics. The present study attempts to understand the socio-demographic characteristics of the female sterilization acceptors within the broader framework of ethical issues. The study further emphasizes the quality of available services, i.e. whether the acceptors are informed about other methods of contraception before the acceptance besides the awareness of possible health problems during the post-sterilization period. Efforts have also been made to examine the follow-up visit by the health workers, and experience of post-sterilization health problems.

DATA AND METHODS

Data from the District Level Household Survey-Reproductive and Child Health conducted during 2002-04 (IIPS 2006) has been used for the present analysis. The survey, which intends to provide information on reproductive and child health, family planning practices besides awareness about RTI/STI and HIV/AIDS in all the districts of India, follows a multi-stage sampling design to select the eligible women for the interview. After selection of the district by systematic circular sampling, 40 villages/urban frame size (UFS) from each district have been selected by adopting probability proportional to size (PPS) sampling and finally, 28 households from each selected village/urban area by systematic circular random sampling. The findings are based on a nationally representative sample of 507622 currently married women aged 15-44 years.

The data has been analysed through SPSS 15.0 and the analytical approach includes both descriptive data as well as bivariate and multivariate analysis. The descriptive statistics show the distribution of respondents by the important variables. The bivariate analysis examines the association between each independent variable (i.e. present age of the woman, age at sterilization of the woman, parity of the woman, sex composition of living children[4], education of the woman, source of sterilization, standard of living of the household[5], religion of the head of the household, caste of the head of the household, place of residence of the household, and region[6]) and dependent variable (i.e. female sterilization). The association between those selected independent variables and variables like 'providers informed the acceptors about other available methods of contraception before sterilization', 'providers informed the acceptors about possible health problems after sterilization', 'follow-up visit at home by health workers after sterilization' and 'health problems after sterilization'[7] has also been studied. Logistic regression has been done to find out the extent that the independent variables can predict the dependent variables. Geographical Information System (GIS) has been used to show the inter-state variations in the prevalence of female sterilization and potential heterogeneity in the data.

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4 Sex compositions of living children are children surviving at the time of survey, not those surviving at the time of sterilization. Thus underplaying the mortality factor after sterilization, as there are chances that some of the women might have experienced child loss after adopting sterilization.

5 Standard of living (SLI) has been constructed by taking into account six variables –type of house, source of lighting, source of drinking water, type of toilet, type of fuel, and ownership of household assets. The variables are given scores ranging between '0' and '4' according to the intensity in a five-point scale (lowest to highest) and then were summed up to get the total value of the index. After obtaining the composite index, it is divided into three groups of low, medium, and high by using the formula: (maximum-minimum)/3.

6 Region has been constructed by merging different states on the basis of their geographical location. The country has been classified into six regions such as North: Chandigarh, Delhi, Haryana, Himachal Pradesh, Jammu & Kashmir, Punjab, and Rajasthan; Central: Chhattisgarh, Madhya Pradesh, Uttar Pradesh, and Uttarakhand; East: Bihar, Jharkhand, Orissa, and West Bengal; Northeast: Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura; West: Dadra & Nagarhaveli, Daman & Diu, Goa, Gujarat, and Maharashtra; and South: Andaman & Nicobar, Andhra Pradesh, Karnataka, Kerala, Lakshadweep, Puducherry, and Tamil Nadu.

7 Though the health problems during the post-sterilization period are reported as a result of sterilization and included in the analysis as an indicator of quality of services, the role of other socio-cultural practices should be taken into account, which the present data is unable to capture and hence may be considered as a limitation of the study.

FINDINGS AND DISCUSSION

Socio-demographic Profile of Female Sterilization Acceptors

The data in Table 1 shows that every third woman in India has undergone sterilization to regulate their fertility. Among the users of modern contraceptives, three out of every four women has been adopting female sterilization. Every second woman aged 30-44 years has been found to be sterilized while the same figure is every tenth woman and every third woman respectively among the women aged 15-24 and 25-29 years. Besides this, among the women of parity lower than three, about one-fifth has accepted sterilization. The strong son preference in India has clearly emerged from the data as out of the women having only daughters, merely 14 percent have undergone sterilization. Contrary to this, about 34 percent women having only sons and 49 percent women having both sons and daughters have undergone sterilization. Additionally, in-depth analysis of those sterilized women without any surviving children (based on 273 observations) has found that most of them (43 percent) are from southern India; reside in rural areas (80 percent); are Hindus (85 percent); belong to households of low SLI (57 percent) and have less than five years of schooling (77 percent). About half of them have never given any birth while the remaining have lost their child/children afterwards. Again, nearly three-fifth (57 percent) of them have undergone sterilization before 30 years of age and most of them (81 percent) have it in government health facilities. The possible reason for those women who have never given any birth but are sterilized, may be because they have either not reported any of their dead children or have adopted it for monetary incentives (probably after knowing their infertility status). Additionally, the role of possible non-sampling errors like quality of data collection can not be totally negated.

The same table reveals that more than one-third of the women with up to four years of schooling have been adopting female sterilization while the same figure is 25 percent among those with 10 or more years of schooling. Thirty-six percent Hindu women have accepted female sterilization, while their share among Muslim women is only 21 percent probably due to the adherence to religious norms, which usually do not favour permanent methods. Although almost a similar percent of women belonging to different castes and places of residence have been using the method, a glance at the modern contraceptive users reveals that sterilization is less prevalent among non-SC/ST/OBC women as well as those residing in the urban areas compared to their respective counterparts. More than half (53

percent) of the women belonging to the southern region has been found to adop it followed by 44 percent of the women from the western region.

Analysing the existing inter-state differences in the acceptance of female sterilization (see Figure 1), in the southern states of Andhra Pradesh, Karnataka and Tamil Nadu, every second woman in the reproductive age has been using female sterilization. Relatively low son preference (Mutharayappa et al. 1997), desire for small family (IIPS and ORC Macro 2000), the power struggle between mother-in-law and daughter-in-law (Saavala 1999), and ignorance about other methods of contraception (Dharmalingam 1995) may possibly have played a role. On the other hand, in most of the northern and northeastern states, prevalence of female sterilization is below the national average. In northeastern states, where the status of women is expected to be high (owing to the matriarchal system and also higher female literacy), women probably are at an advantageous position where they can make a decision to choose the method of their choice. Along similar lines, Figure 2 portrays the heterogeneity in the data at the district level in India. It is clear that the acceptance of female sterilization is above the national average in almost all the districts of south and western India. Again, classifying the total 593 districts according to acceptance of female sterilization, less than 20 percent of the women in about a quarter of the districts are found to be sterilized. The same figure is between 20-34 percent, 35-50 percent and more than 50 percent of the women respectively in 35 percent, 27 percent and 13 percent of the districts.

Quality of Care

The salient elements of family planning programmes that together constitute quality are: choice of method, information given to users, technical competence, inter-personal relations, follow-up or continuity mechanisms and appropriate constellation of services (Bruce 1990). In view of the objectives of the research and availability of the data, the present paper addresses three out of the six elements of the quality of care framework of Bruce, i.e. information given to users, technical competence, and follow-up or continuity mechanisms. The variables like 'providers informed the users about other available methods before sterilization' and 'users are informed about possible health problems after sterilization by the health providers' has been used to measure informed consent or information given to users in the framework. Again, 'the experience of health problems after sterilization' has been considered as a proxy to measure the technical competence of the providers. Finally, 'follow-up visit by the health worker' has been considered to measure the continuity mechanisms.

Informed Consent: How Far it is Practiced?

In the context of sterilization, informed consent means that the user has been made aware of the other choices of methods of contraception besides the possible health problems that might occur and grants her consent voluntarily without any inducement, force, deceit, bias or any other form of coercion. As may be observed from the data in Table 2, at the national level, out of the total acceptors of female sterilization, majority (71 percent) have not been informed about other methods of contraception before being sterilized. Almost a similar percent of women have also revealed that the providers have not informed them about the possible health problems that may arise after adopting the method. Further, a relatively lower percent of sterilized women of parity five or higher have been found 'informed about other methods of contraception before sterilization' and 'possible health problems after sterilization' than those women of parity lower than three.

Nearly one-third of the women who have undergone sterilization in private health institutions have the information about other methods of contraception before sterilization, while the same figure is 28 percent among those sterilized in government health facilities. As expected, informed consent has been found to be higher among women who have 10 or more years of schooling and those belong to high SLI households as compared to their respective counterparts with less than five years of schooling and belonging to low SLI households. It may be said that the awareness level increases with advancement in educational status. Relatively higher percentage of women from other backward class (OBC) have the information about other methods of contraception and possible health problems after sterilization than those Scheduled Caste (SC), Scheduled Tribe (ST) or non-SC/ST/OBC women. Similarly, non-Hindu/ Muslim women have relatively better information about the above-mentioned indicators than those Hindu or Muslim women. Again, women residing in urban areas are in a better position than their rural counterparts. At the regional level, 60 percent of the women from the northeastern region have been informed about other methods of contraception before sterilization, while the same is 40, 34, 26, 21, and 18 percent respectively among the women from the northern, southern, western, central and eastern region. The providers are expected to inform the sterilization acceptors about the possible health problems that might arise after adopting the method. However, the findings in the same table reveal the regional differences in the indicator with women from the northeastern region being

better informed than the women in other parts of India, indicating that the providers have either not counselled or inadequately counselled the women before adopting sterilization.

Available Services: How Good are They?

It has been observed that about one-third of the sterilized women at the national level have had follow-up visits by the health workers after sterilization (see Table 2). The follow-up visits have been found relatively higher among those sterilized in government health facilities and are from the rural areas than their respective counterparts. This may be because the urban women probably having sought the services from private providers who generally do not provide follow-up services at home. Interestingly, among women with 10 or more years of schooling and those from high SLI households, the health workers have visited less than a quarter from each of them. Use of private health facilities may have resulted in this. It is again merely six percent of the women from the northeastern region has reported follow-up visits at home, which is 35 percent each among the women from the western and southern region.

Analysing the health problems after sterilization, 17 percent of Indian women have suffered from at least one of the health problems after sterilization. The problems seem to be more among those sterilized in government health facilities (17 percent) compared to those sterilized in private health facilities (10 percent). In-depth analysis of those women undergoing sterilization in government health facilities and reporting post-sterilization health problems reveals that health providers have not informed a majority of them about the possible health problems after sterilization (71 percent) coupled with poor follow-up visits (35 percent), questioning the quality of services. Additionally, as a majority of them belong to rural areas (77 percent); from households with low SLI (52 percent); have less than five years of schooling (70 percent); and were aged 30-44 years at the time of sterilization (37 percent), the possible role of malnutrition and other co-morbidities cannot be totally annulled. Experience of health problems is the highest among the women from eastern India (27 percent) and the lowest among those from northeastern India (11 percent). Additionally, Figure 3 reveals that 'bodyache/backache' after sterilization (56 percent) followed by 'weakness/ inability to work' (46 percent) has been reported by a majority of the women who have any health problem after sterilization. 'White discharge' is another common problem and has been reported by 29 percent of the women. Another about 23 percent women have suffered from 'dizziness' after sterilization. 'Cramps' and 'irregular periods' are other problems that are found among almost every tenth sterilized women.

Determinants of Female Sterilization

The data in Table 3 presents the odds ratios of logistic regression analysis assessing the association between women's selected background characteristics and female sterilization. It again attempts to assess the relationship of selected background characteristics with 'providers informed the users about other methods of contraception before sterilization'; 'providers informed the acceptors about possible health problems after sterilization'; 'follow-up visits by health workers after sterilization' and 'health problems after sterilization'. The point that needs to be informed is that assuming the zero parity women are not at risk of accepting female sterilization, only those women with one or higher parity have been included in the regression model assessing the association between female sterilization and selected background characteristics of the women. Specifically, the dependent variable in the regression model is adopted sterilization (yes = 1 and no = 0). It is worth mentioning that due to multicollinearity problem, the variables such as parity of the woman and education of the husband has not been included in this regression model. On the other hand, only those women with at least one parity and who have adopted sterilization have been considered for the other regression models. The dependent variables for these models are: informed about other contraceptive methods before sterilization (yes = 1 and no = 0), informed about possible health problems after sterilization (yes = 1 and no = 0), had follow-up visits at home (yes = 1 and no = 0) and have experienced any health problem after sterilization (yes = 1 and no = 0).

It has been found that after controlling the effects of other variables, the likelihood of female sterilization decreases significantly among the women with only daughters than those with both sons and daughters. There is a significantly inverse association between female sterilization and education of the women. Religion as a predictor variable has revealed that the Muslim women are less likely to have sterilization than those Hindu women. Again, it is the non-SC/ST/OBC women who are more likely to adopt the method than those SC women. The probability of sterilization is further significantly higher among the rural women than their urban counterparts. It has also been found that the women from southern as well as western India are more likely to adopt the method compared to the women from northern India. The relationship has come out statistically significant as well.

The analysis reveals that after controlling the effects of other variables, the women with 10 or more years of schooling, women from households of high SLI and women residing in urban areas are less likely to be

'informed about other methods of contraception before sterilization from the health providers' than those respectively have less than five years of schooling, from households of low SLI, and reside in rural areas. This may be because these women probably have other sources of information about contraception such as mass media, educational materials rather than the health providers. Again, analysing region as an explanatory variable, women from the northeastern region are less likely to be 'informed about other methods of contraception before sterilization from the health providers' compared to their northern counterparts. A similar picture may be seen so far as the association between region and 'providers informed the users about possible health problems after sterilization' is concerned. Additionally, women with 10 or more years of schooling and women from households of high SLI are less likely to report of being informed by the providers about possible post-sterilization health problems than those respectively with less than five years of schooling and from households of low SLI, perhaps owing to other sources of information.

Analysing the odds of 'follow-up visit by health workers after sterilization', it increases significantly with an increase in age, education, and SLI. Urban women are less likely to have follow-up visits at home than their rural counterparts. The probability of follow-up visits is significantly low among the south Indian women compared to those from north India. The findings further inform that the likelihood of 'health problems after sterilization' is significantly high among the women having 10 or more years of schooling, from households of higher SLI, and from urban areas than those respectively having less than five years of schooling, from households of low SLI and are from rural areas, perhaps due to their awareness about the problems and subsequent reporting. Finally, the probability of experiencing any health problem seems to be significantly high among the women from southern India than their northern counterparts.

However, besides the variables included in the present analysis a number of other programmatic as well as non-programmatic variables do affect the acceptance of female sterilization as well as the ethical issues associated with it. Further research with additional support from qualitative data may be required to understand the issue in a better way especially in the Indian context.

CONCLUSION

Even after five decades of implementation, the family welfare programme in the country seems to be dominated by one and only method, i.e. female sterilization. Although about one-third of the Indian women adopt

sterilization, people from various socio-economic-religious groups do not generally opt for sterilization in equal proportions. Looking at the issue from an ethical point of view, female sterilization as a method is not uncommon among young women and women of parity lower than three. It has been compounded by the fact that out of the total women, who have undergone sterilization, before the acceptance of sterilization the majority was neither informed about other methods of contraception nor were they informed about the possible post-sterilization health problems by the providers, leaving a question mark on the intentions of the providers as well as government. Besides this, post-sterilization follow-up home visits by the health workers to the women were rather uncommon. Many women reportedly have experienced post-sterilization health problems too. All this clearly reflects on the poor quality of services available to the acceptors. Another concern emerging from the analysis is wide inter-state as well as inter-region differences in both the acceptance of the method and quality of available services. Thus, female sterilization as a family planning method in its present form, to a greater extent, has failed to address the ethical issues associated with it.

The acceptance of female sterilization at an early age calls for the need to pay special attention to examine the issue more closely and study its consequences on women's/couple's health, fertility, etc. This becomes more important in today's times when killer diseases such as HIV/AIDS have spread their arms in all corners of society. Early adoption of sterilization coupled with delay in marriage (due to social-economic development) results in compression of the reproductive span leading to lowering fertility levels in the population. The present analysis does not, however, address these important and related issues of early adoption of female sterilization. It may nevertheless, be worthwhile to mention the experience of Andhra Pradesh in this context. Andhra Pradesh is one of the states in the country, which has achieved replacement fertility primarily by promoting sterilization as a method, more so female sterilization. The state has successfully reduced its total fertility rate (TFR) by almost one-third in just 13 years from 2.59 in 1992-93 to 1.79 in 2005-06. The prevalence rate of female sterilization in the state went up from only 38 percent in 1992-93 to 63 percent in 2005-06, highest in the country (accounting for almost 93 percent of the total contraceptive users) (IIPS and ORC Macro 2007). Such experiences, however, must not be considered as a role model in view of the diverse socio-cultural background in different states/regions and the demand for female sterilization.

Female sterilization at an early age may lead to low condom use, which is crucial for prevention of RTI/STI as well as HIV/AIDS particularly among the young women who are more vulnerable in traditional settings like ours. There are evidences from various parts of the world that the adolescent/youth are at greater risks of HIV/AIDS as new cases of HIV/AIDS are more among them (UNIADS 2005 and NIMS 2005). It has been found that once a couple has undergone sterilization it is rather difficult to motivate/convince them to use condoms which can prevent them from acquiring HIV/AIDS as most couples view family planning primarily as a means for spacing/regulating fertility and not as an aid for protections against diseases/infections. A study on female sex workers in Andhra Pradesh revealed that fewer sterilized sex workers were using condoms with non-client partners such as husbands than those who were not sterilized (Dhopeshwarkar 2007). It has again been noted that in Andhra Pradesh, advocating condom use has been viewed as promoting promiscuity (Steinbrook 2007).

Although the present shape of the Indian family planning programme is somehow credited to its past policies like target approach as well as cash incentives to acceptors in order to curb the rapidly growing population, the time now has come when the policy makers need to think of the issue from the humanitarian point of view. The need of the hour is to offer choice and quality services. Female sterilization should be presented as one of the many options available to women interested in permanent contraception. Potential clients should receive complete information about all available family planning methods with no undue emphasis on sterilization. Additional care must be taken when counselling women under 30 years of age or those without surviving children. In short, public as well as private health care providers should ensure that the principle of informed consent becomes a reality. Further, sensitizing the service providers, especially those working at the grass root level, about the importance of ethical issues associated with female sterilization may be another significant step forward in fulfilling the commitment of ensuring informed consent. Above all, improving information education and communication, provision of better quality services, and emphasis on spacing methods will empower women in choosing better options and answer many questions from ethical protagonists. Finally, ethics and human values should be of a high priority in policy formulation and training of personnel beside public awareness in matters of family planning. ❑

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TABLE 1
Socio-demographic Profile of the Female Sterilization Acceptors, India, 2002-04

Socio-demographic characteristics	*Sterilization users (Out of modern method users)*		*Sterilization users (Out of total currently married women)*	
	Percent	*N*	*Percent*	*N*[1]
Present age of the woman				
15-24 years	51.6	28629	9.9	149297
25-29 years	68.5	51687	32.0	110542
30-44 years	81.7	151430	49.9	247782
Parity of the woman				
≤ 2	61.2	90936	20.8	267641
3-4	84.7	104686	54.6	162523
≥ 5	81.8	36124	38.2	77457
Sex composition of living children				
No living child	16.4	1666	0.4	63053
Have both sons and daughters	80.8	155195	48.7	257532
Have sons only	70.6	52640	33.9	109686
Have daughters only	49.6	22245	14.3	77351
Education of the woman				
0-4 years#	85.3	118566	36.6	275872
5-9 years	74.2	64723	36.0	133574
≥10 years	51.1	48360	25.2	97897
Standard of living of the household				
Low	84.5	80011	30.8	219723
Medium	78.3	80398	39.4	159657
High	60.7	71336	33.8	128242
Religion of the head of the household				
Hindu	77.4	194894	36.1	418442
Muslim	58.5	22031	20.9	61778
Non-Hindu / Muslim	68.2	14821	36.9	27402
Caste of the head of the household				
Scheduled Caste (SC)	80.9	41277	34.8	96055
Scheduled Tribe (ST)	81.0	17389	31.6	44580
Other Backward Class (OBC)	80.7	91255	36.0	204772
Non-SC/ST/OBC	64.4	79364	32.7	156398
Place of residence of the household				
Rural	81.1	145363	34.1	345948
Urban	64.9	86383	34.7	161674
Region				
North	61.6	32707	30.8	65349
Central	68.0	38898	22.2	119224
East	70.1	41844	26.5	110701
Northeast	43.5	4892	12.6	16811
West	75.8	44136	43.7	76503
South	90.1	69269	52.5	119033
India	**75.0**	**231746**	**34.3**	**507622**

1 Total figure may not add to N due to missing cases; # Includes non-literates

TABLE 2

Percent of currently married women who were informed about other contraceptive methods before sterilization by providers, informed about possible health problems after sterilization by providers, had follow-up visits at home by the health worker, and experienced any health problems after sterilization, India, 2002-04

Socio-demographic characteristics	*Informed about other contraceptive methods before sterilization*	*Informed about possible health problems after sterilization*	*Had follow up visits at home*	*Experienced any health problems after sterilization*	*N*[1]
Present age of the woman					
15-24 years	29.7	30.3	37.1	15.0	14786
25-29 years	29.0	30.0	34.8	16.9	35400
30-44 years	28.7	29.3	29.9	16.5	123718
Age at sterilization of the woman					
≤ 24 years	28.4	29.7	35.0	16.6	47754
25-29 years	29.5	29.6	31.8	17.0	59533
30-44 years	28.6	29.4	28.7	16.0	66206
Parity of the woman					
≤ 2	31.9	31.9	31.0	13.5	55670
3-4	28.2	29.0	31.8	17.2	88677
≥ 5	25.3	26.6	31.5	20.1	29558
Education of the woman					
0-4 years#	25.7	28.1	34.3	18.7	101101
5-9 years	31.3	30.9	29.2	15.1	48041
≥10 years	37.0	32.6	24.4	10.0	24694
Source of sterilization					
Government	28.4	29.7	34.7	17.3	142165
Private	31.5	28.8	16.4	11.8	29006
Standard of living of the household					
Low	24.9	27.1	36.1	20.4	67621
Medium	29.9	31.2	32.6	15.8	62966
High	33.5	31.0	22.8	11.4	43318
Religion of the head of the household					
Hindu	28.3	29.4	32.3	16.4	150910
Muslim	31.8	27.4	21.6	19.1	12892
Non-Hindu / Muslim	33.2	33.8	32.1	14.6	10103
Caste of the head of the household					
Scheduled Caste (SC)	27.4	30.5	33.7	19.7	33410
Scheduled Tribe (ST)	26.3	29.6	39.4	18.9	14093
Other Backward Class (OBC)	30.8	31.7	33.5	15.2	73670
Non-SC/ST/OBC	27.9	25.9	25.3	15.4	51080

Place of residence of the household					
Rural	27.4	29.0	36.4	18.1	117869
Urban	31.9	30.7	21.3	13.1	56036
Region					
North	40.2	35.9	31.7	14.9	20133
Central	21.4	23.1	31.7	18.2	26441
East	18.0	18.5	20.2	26.5	29321
Northeast	60.3	57.0	6.1	10.7	2126
West	25.9	28.0	35.6	16.4	33440
South	34.0	35.3	35.4	11.8	62445
India	**28.9**	**29.5**	**31.5**	**16.5**	**173905**

1 Total figure may not add to N due to missing cases; # Includes non-literates

TABLE 3

Odds ratios of logistic regression assessing the association of women's selected background characteristics with acceptance of female sterilization, informed about other contraceptive methods before sterilization by providers, informed about possible health problems after sterilization by providers, had follow- up visits at home by the health worker, and experience of any health problems after sterilization

Explanatory variables	*Adopted female sterilization® (Yes=1 N0=0)*	*Informed about other contra-ceptive methods before sterilization (Yes=1 No=0)*	*Informed about possible health problems after sterilization (Yes=1 N0=0)*	*Had follow-up visits at home (Yes=1 No=0)*	*Experienced any health problem after sterilization (Yes=1 No=0)*
	N=441324 Exp (B)	*N=157078 Exp (B)*	*N=157078 Exp (B)*	*N=157078 Exp (B)*	*N=157078 Exp (B)*
Present age of the woman					
15-24 years ®					
25-29 years	3.110***	1.026	0.983	1.056**	0.895***
30-44 years	6.229***	1.011	0.972	1.183***	0.913***
Sex composition of living children					
Have both sons and daughters ®					
Have sons only	0.685***	—	—	—	—
Have only daughters	0.174***	—	—	—	—
Education of the woman					
0-4 years# ®					
5-9 years	0.992	0.833***	0.920***	1.032*	1.074***
≥10 years	0.489***	0.664***	0.865***	1.203*	1.436***

Standard of living of the household					
Low ®					
Medium	1.481***	0.998	0.939***	1.083***	1.120***
High	1.236***	0.967**	0.947***	1.287***	1.342***
Religion of the head of the household					
Hindu ®					
Muslim	0.319***	0.731***	0.988	1.631***	0.775***
Non-Hindu / Muslim	0.967**	1.146***	0.903***	0.884***	1.104***
Caste of the head of the household					
Scheduled Caste (SC) ®					
Scheduled Tribe (ST)	0.970**	0.903***	1.020	0.841***	1.171***
Other Backward Class (OBC)	1.063***	0.918***	1.043**	0.999**	1.164***
Non-SC/ST/OBC	1.108***	1.040**	1.194***	1.246***	1.199***
Place of residence of the household					
Rural®					
Urban	0.905***	0.976	1.129***	0.820***	1.036*
Region					
North ®					
Central	0.746***	2.423***	1.960***	1.124***	0.822***
East	0.858***	2.922***	2.367***	1.555***	0.554***
Northeast	0.341***	0.377***	0.793***	7.994***	1.713***
West	2.186***	2.353***	1.522***	0.825***	0.788***
South	3.797***	1.355***	1.038**	0.888***	1.275***
Constant	0.177	1.578	1.574	1.165	4.465
-2 log likelihood	460701.12	182460.83	190056.48	186758.11	137824.28
Cox-Snell R^2	.227	.064	.031	.066	.022

@ Based on currently married women with one or higher parity;® Reference category; # Includes non-literates;; — Not Included; *P <0.10 **P <0.05 ***P <0.01

Figure 1
Percentage of Female Sterilization by States, India, 2002-04

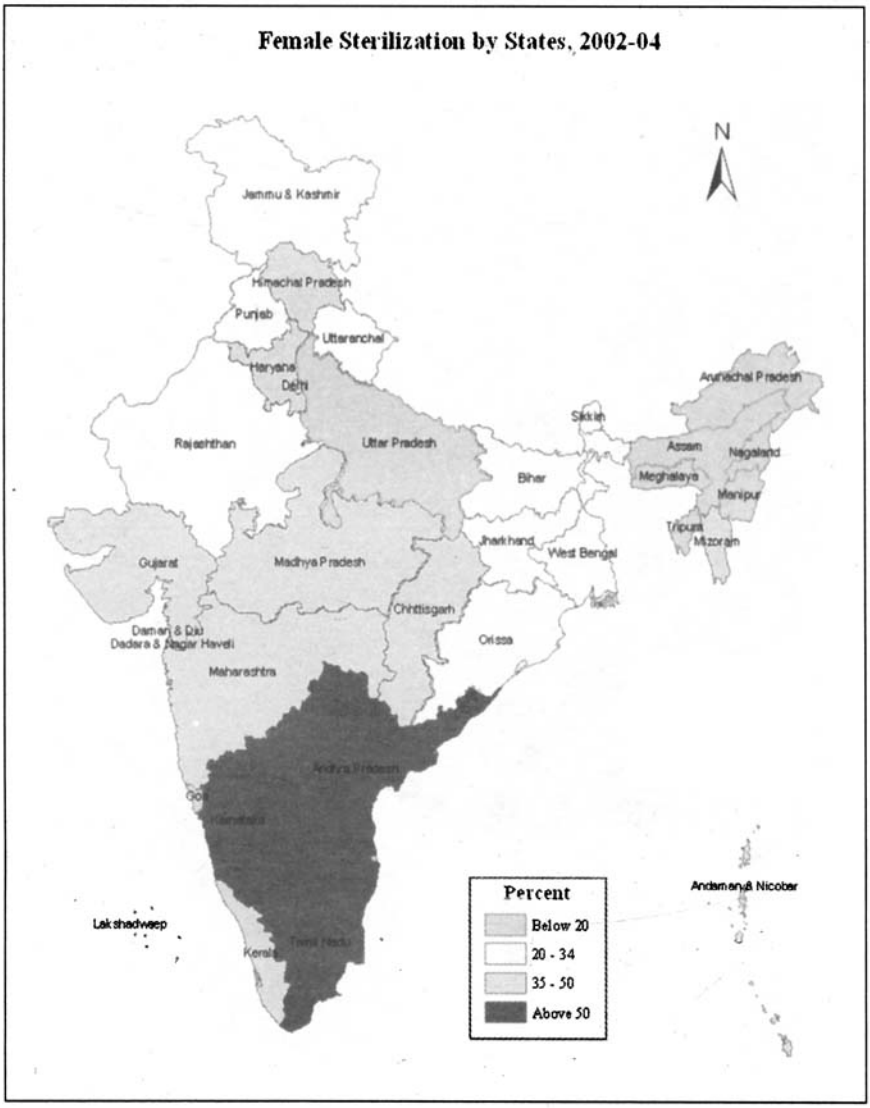

Figure 2
Percentage of Female Sterilization by Districts, India, 2002-04

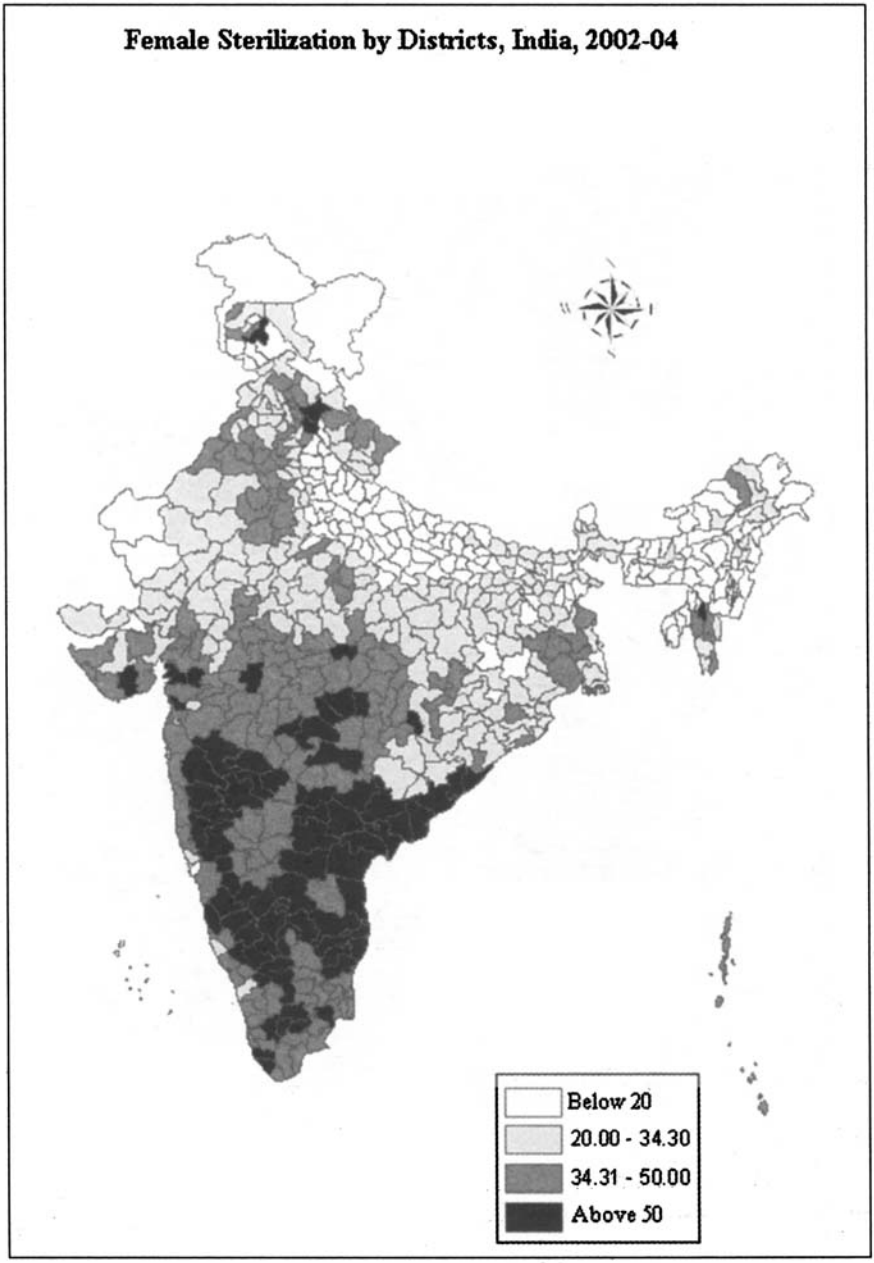

Figure 3
Post-sterilization Health Problems, India, 2002-04