

**TOO MUCH OF A GOOD THING?  
FEMALE STERILIZATION IN INDIA:  
A LITERATURE REVIEW**

by

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## Abstract

India has the largest number of sterilized women in the world; as of 2005-06, two thirds of Indian women of reproductive age had undergone sterilization. This paper reviewed literature both from peer-reviewed publications and soft literature to understand issues surrounding such pervasive use of the method. Four major thematic areas emerged: the use of incentives and targets in promoting female sterilization (FS), socio-demographic factors influencing FS use, quality of care in sterilization camps, and sterilization regret. Following the advice of public health advocates, the government should commit to improving informed choice and access to a variety of methods as well as increase efforts to educate on and provide vasectomy services. Future academic research should address the use of incentives and targets in promoting FS at the expense of other methods.

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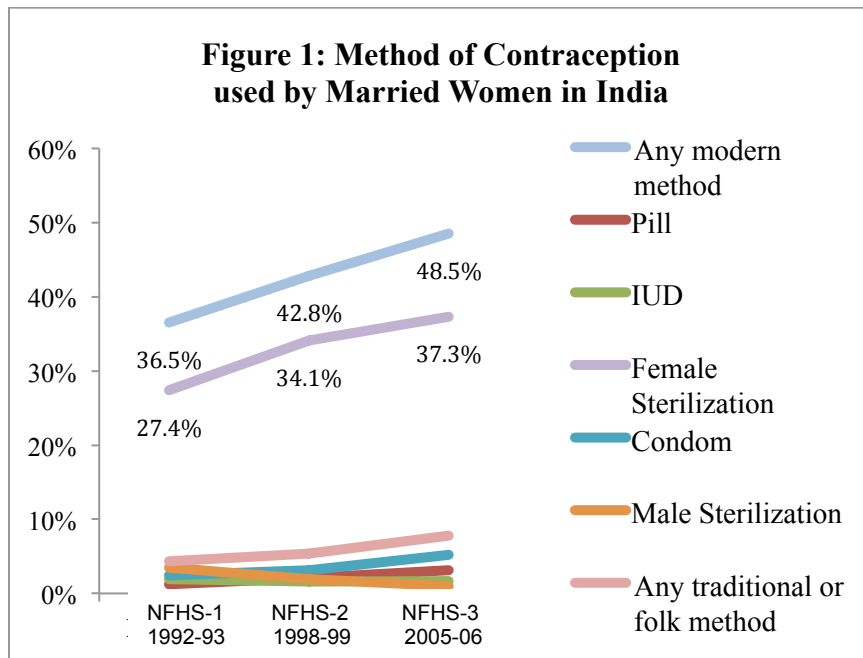
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## Problem Statement

Across the world, access to family planning services has been shown to reduce maternal mortality and improve quality of life for women, children, families, and communities.<sup>1</sup> In India, as contraceptive use over the past 30 years has increased, the total fertility rate (TFR) and infant and child mortality rate have decreased. In 1992-3, 40.7% of married women used any form of contraception, increasing to 56.3% in 2005-6. Simultaneously, the TFR declined from 3.4 to 2.7 children per woman.<sup>2,3</sup> Despite a declining TFR, access to a variety of contraceptive services remains elusive for many, with a current estimated unmet need for contraception for 12.8% of women.<sup>2</sup>

Female sterilization (FS) far and away dominates the field of contraceptive use in India. It is not only the most widely known (96.6% of women and 94.8% of men know of it), it accounts for 66% of all contraceptive use.<sup>2</sup> India has the highest number of women sterilized in the world and has the third highest FS rate in the world after the Dominican Republic and Puerto Rico. This trend is not new; FS has been the most popular contraceptive option in India since 1977.<sup>2,4</sup> Figure 1 illustrates how much more utilized FS is compared to other options for married women of reproductive age using data from three rounds of the National Family and Health Survey, a population-based household survey on socio-demographic and health indicators. A number of concerns, however, have arisen in response to the popularity of FS, with many reproductive and public health experts questioning its continued use as the leading form of contraception. These concerns include deaths in sterilization camps, studies which suggest many women are not counseled on alternative options or the risks associated with FS, the inaccessibility of

spacing methods to many, and the young age at which many women become sterilized. In fact, in February 2016, Indian officials announced that government clinics will begin providing free injectable contraceptives to enable more women to access reversible contraception.<sup>5</sup>



This literature review aims to explore the issues surrounding female sterilization in India, focusing on the themes of the use of incentives and targets in promoting sterilization, lack of access to other contraceptive methods, socio-demographic factors influencing FS use, quality of care in sterilization camps, and sterilization regret. While sterilization has been India’s top contraceptive method for 39 years, and numerous concerns exist around its heavy utilization, no literature review surveying the body of knowledge of these topics has been written to date.

## Background

India is a South Asian country of approximately 1.25 billion people.<sup>6</sup> Currently the world's largest democracy, India is expected to surpass China as the most populous nation by 2022.<sup>7</sup> India is a federal republic consisting of 29 states and 7 union territories which have substantial regional power. Health outcomes differ markedly by region, gender, caste, education, and wealth.<sup>8</sup>

Female sterilization is a highly effective, permanent method of contraception which involves the closing or blocking of a woman's fallopian tubes so eggs do not reach the uterus.<sup>9</sup> It is the most popular form of birth control used worldwide, with over 220 million women married or in union aged 15-49 employing the method as of 2013.<sup>10</sup> Two forms of the procedure exist, the abdominal method (a laparotomy or mini-laparotomy) and laparoscopy, introduced in the 1980s.<sup>4</sup> It cannot be easily reversed as the reversal procedure is difficult and often very expensive. Complications that may occur with tubal ligation include ectopic pregnancy and abnormal uterine bleeding and failure can also occur in approximately one of out every 200 cases.<sup>11,12</sup>

In 1952, India became the first developing country to create a family planning program with the creation of the National Family Welfare Program. From 1966, targets were set to meet goals to reduce rapid population growth, with field health workers given quotas for the number of men and women brought in to receive contraceptives, usually sterilization. Incentives were provided both to the providers and new acceptors of sterilization. During these years, a greater proportion of sterilizations were done in males, with FS ranging

from maximum 41.6% to as low as 10.4% of all sterilization procedures in a given year between 1960-1970.<sup>13</sup>

From June 1975 until January 1977, a national emergency was declared as Prime Minister Indira Gandhi attempted to gain control over a number of issues facing India, including high inflation, rampant population growth, low food production due to water shortages, and growing political unrest.<sup>14</sup> With the enactment of the state of emergency, the government cracked down on protests, strikes, censored the press, and jailed many opposition leaders.<sup>14</sup> In April 1976, a national population policy was approved detailing sixteen population and family planning measures, including allowing states to pass compulsory sterilization laws and tying some central government funding to states on meeting family planning targets.<sup>14</sup> States adopted laws ranging from creating further incentives for sterilization (in Andhra Pradesh government employees who became sterilized received a raise), to punishment (Bihar denied food rations to families with over two children, Himachal Pradesh stopped providing maternity leave for female workers after their first two children).<sup>14</sup> Maharashtra even implemented mandatory sterilization of couples who had over two children.<sup>14</sup>

While many of these specific laws never actually went into effect before the end of the emergency period, large sterilization targets were vigorously pursued across the country. Taking advantage of the “vasectomy camp” model introduced in the late 60s, over 8 million sterilizations were performed during the “Emergency.”<sup>15</sup> In just one month, September 1976, over 1.7 million sterilizations were performed--the average for the *annual* number of sterilizations in the previous ten years.<sup>14</sup> These sterilization efforts

affected both men and women, but were more often geared toward men; in 1976-1977 75% of sterilizations performed were on men.<sup>13</sup> In March 1977, a national election led to the ouster of Prime Minister Gandhi and a severe slowdown in male sterilization efforts.

In the wake of this horrific time, FS began to grow in popularity due not only to resistance among men to becoming sterilized but also to active promotion of FS by the Family Planning Program.<sup>16</sup> Additionally, the introduction of a laparoscopic procedure for FS allowed the procedure to be done much more quickly, and in an out-patient setting.<sup>16</sup> By 1985, it was estimated that FS made up approximately 80% of all sterilizations.<sup>16</sup>

In the 1990s, the family planning program underwent a tremendous shift, with the introduction of a human rights framework at International Conference on Population and Development (ICPD) in Cairo in 1994. Rather than seeing family planning provision in the context of population control, countries were now encouraged to think of it in the framework of reproductive rights. The resulting Program of Action defined reproductive health as “a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity, in all matters relating to the reproductive system” and that people have “the capability to reproduce and the freedom to decide if, when and how often to do so.”<sup>17</sup> It also required that individuals have information on and access to a variety of family planning methods. In 1996, following India’s signing of ICPD’s Program of Action, the family planning program officially abandoned quotas for sterilization and contraception use. In 1997, the Reproductive and Child Health Program was launched, which also ended the previous family planning incentive system.



In 2000, India's National Population Policy committed to providing improved access to information, counseling, and a variety of contraceptive services as a means of achieving population stabilization. This commitment was reiterated at the 2012 London Family Planning Summit, with the declaration of "a paradigm shift in our whole approach to family planning with key emphasis now being laid on the provision and promotion of spacing methods."<sup>18</sup>

However, even without official targets, female sterilization continues to be far and away the most popular method of family planning in India. While prevalence differs significantly from state to state, (in northern state Uttar Pradesh 17% of married women aged 15-49 used FS in 2005-2006 as opposed to 63% in Andhra Pradesh), overall FS accounts for two thirds of all contraceptive use in this group as of 2005-06.<sup>2</sup>

## Methods

Fifty articles, papers, reports and books were selected based on their relevance to the topic and the time of publication. Primary searches were conducted using Pubmed, Scopus, and Web of Science, using the terms *female sterilization*, *India*, *tubectomy*, and *family planning*. Reference lists from identified articles were searched for additional citations of interest since initial searches revealed few useful articles. Soft and gray literature was searched using Google in order to understand current program and policy materials as well as research done outside of peer-reviewed journals. Popular news

outlets *The Times of India*, *The Hindu*, and *Hindustan Times* were also searched in order to get a sense of current events related to FS in India.

One limitation of this review is that the literature used was all in the English language, excluding publications written in Hindi or regional languages within India.

## Themes

### Incentives and Targets

In 1996, India officially adopted a target-free policy toward family planning which stated that targets would no longer be set for number of women sterilized and emphasized the importance of voluntary adoption of family planning practices. However, many researchers, policy makers, and those working in the NGO sector assert that targets are still being set at local and state levels for female sterilization, and methods are often coercive.<sup>11,19-22</sup> In a 2012 investigation by Human Rights Watch, dozens of health workers in Gujarat told the organization they received threats of salary reduction or dismissal if they did not achieve their targets for numbers of women sterilized.<sup>19</sup> Doctors have also reported that they receive pressure to meet targets.<sup>23</sup> Other states, including Bihar in 2011, have apparently set targets, with the government setting a target of 650,000 women and 12,000 men for sterilization.<sup>24</sup>

Incentives are often offered to women to encourage sterilization, in the form of cash or gifts. Some non-cash incentives include radios, gold coins, and drawing for prizes or

trips, including a 2011 drawing for a car in Rajasthan.<sup>15,19,22,25</sup> This is further compounded by pressure through other governmental initiatives, including a “girl child promotion” program where in order to receive rewards, the family must produce a sterilization certificate from the mother when the daughter turns 18.<sup>26</sup> While some incentives may seem modest (~\$11 in cash was offered as of 2006 in Andhra Pradesh and there are reports of \$10 incentives in Bihar), for low-income rural women in a country with a \$616 median income, a seemingly small amount can go a long way.<sup>15,23,27</sup>

In the wake of the death of 13 women in a Chhattisgarh sterilization camp in November 2014, further discussed in the “Quality” section, a commission made up of a team of public health professionals from leading reproductive health organizations launched an investigation. In a 37 page report, the commission contends that not only were conditions dangerous in the sterilization camp, but incentives for sterilization created a coercive and unsafe environment.<sup>20</sup> The commission found that in 2013-14, the vast majority of Indian government spending on family planning went to incentives and compensation. In Chhattisgarh specifically, Rs 155.9 million (~USD \$2.34 million) spent on family planning went towards sterilizing women with Rs 127.6 million (~USD \$1.92 million) paid as compensation and incentives.<sup>20</sup> The commission recommended that incentives, which encourage both women to undergo sterilization and doctors to perform them in rapid succession, are inappropriate and lead to unsafe conditions.

## Socio-demographic Factors Influencing Female Sterilization Use

Analyzing NFHS data from 2005-2006, researchers Oliveira et al. found that women with lower income, less education, and from traditionally marginalized communities including lower castes have less opportunity to use modern methods other than FS.<sup>37</sup> This is due to a variety of reasons, including lack of affordable and accessible reversible contraceptive methods for many women, misinformation or lack of information regarding various non-permanent forms of birth control, and influence of family on reproductive choices. A persistent preference for sons in South Asian culture also continues to affect when women become sterilized.

### Lack of Access to other Methods

#### *Lack of Information/Informed Choice*

*“The demand for sterilization services exists, but it is essentially a false demand as there are neither other long term suitable options available on a regular basis nor is there adequate access to information and counseling on all aspects related to sterilization.”*

-Robbed of choice and dignity: Indian women dead after mass sterilization. Situational assessment of sterilization camps in Bilaspur District, Chhattisgarh: Report by a multi-organizational team.

Despite the Indian Family Planning Program’s commitment to a “basket of options,” numerous reports and publications have demonstrated that women often do not know of or have access to methods of contraception other than sterilization.<sup>2,29-33</sup> Koenig et al.’s 2000 literature review of quality of care within the Indian Family Welfare Program found that in nearly all of the studies analyzed women received very little information on contraceptive choice from healthcare providers, and that FS was often stressed.<sup>30-32,34</sup>

These include a 1994 study in Maharashtra where over 60% of 1,023 women interviewed reported that they were not informed of spacing methods from visiting nurses and a study in the four states of Bihar, West Bengal, Tamil Nadu, and Karnataka wherein 24-39% of women interviewed in each state reported only being offered FS from health workers.<sup>31,32</sup> In addition, male sterilization was seldom suggested as a possible contraceptive option and side effects of FS were rarely mentioned.<sup>30,32,33</sup> Though these studies are over 16 years old, more recent studies and reports, including the 2011 roundtable of the National Coalition on Population Stabilization, Family Planning, and Reproductive Rights, show little improvement.<sup>29</sup>

In the NFHS-3, fewer than 30% of women (27.9%) reported being informed of a contraceptive method other than the one they received, with only 18-22.8% of couples using any reversible method prior to FS.<sup>2</sup> This proportion is lowest in Andhra Pradesh, where only 14% of contraception users reported being informed of another contraceptive option, which also has the youngest median age of women being sterilized (23 years), and the highest prevalence of female sterilization (61.5% of married women using contraception are sterilized).<sup>2</sup> In Prayeg et al., a 2014 study surveying rural-dwelling women who were sterilized in Belgaum, Karnataka, the majority of women were poor (81% below poverty line) and unaware of male sterilization (59%).<sup>35</sup> In Arora et al.'s 2010 study of 109 married women seeking sterilization in New Delhi, one third had never heard of reversible contraceptive methods (two thirds of the women were below the age of 30), 62% had never used any form of reversible contraceptive prior to sterilization, with 53% never using because of fear of complications.<sup>36</sup> Simultaneously, 93.6% of the women did not know that FS sometimes fails or that complications can occur.<sup>36</sup> In the

Chhattisgarh sterilization camp where 13 women died, patients were not informed of possible side effects of the sterilization surgery or given alternative options.<sup>20</sup>

These findings suggest that women are undereducated on both the benefits of spacing methods and the risks associated with sterilization.<sup>31,33,36</sup> Public sector supplies of reversible contraceptive methods are often unavailable in part due to distribution and supply chain difficulties, leaving women with little access to alternatives to FS.<sup>20,11</sup> These shortages, as well as the opinion that client preference is of little importance, have been cited by healthcare providers as reasons that offering a range of options is often impractical or unnecessary.<sup>30,31</sup>

### **Money**

Money plays a significant role on several fronts, including the costs associated with alternative contraceptive methods for women and their partners, the ability of lower-income women to learn about and have access to non-permanent methods, the financial incentives associated with sterilization, and the financial support the government provides to sterilization efforts at the expense other methods. Indeed, there is a strong association between wealth and education and the use of non-permanent methods in India; highly educated women are approximately three times as likely to use these methods compared with women with no formal education.<sup>2</sup> In the NFHS-3 report, 89.5% of women who had been sterilized reported receiving the procedure for free, as compared to 76.1% of women who used the pill getting it for free and 67.9% using an IUD.<sup>2</sup> Adding the financial incentives afforded by sterilization, and it begins to look like a more appealing option. Tiago de Oliveira et al's paper analyzing the NFHS-3 report found that

there is a “clear poverty gradient” with regard to method choice and that women from marginal and “backwards” communities, particularly women in scheduled tribes, often have less access to reversible methods.<sup>37</sup> In their analysis, women in the highest wealth bracket had 1.49 times the odds of using a modern method compared with FS than the poorest women ( $p < 0.001$ ). In their 2013 paper on post-sterilization autonomy in Southern India, Pallikadavath et al. found in their qualitative research that poor women were influenced by the monetary incentives and free provision of sterilization services.<sup>38</sup>

## Son Preference

A desire for sons continues to influence contraceptive use in India, particularly in the north.<sup>2,39</sup> In the NFHS-3, women who had two sons and no daughters were 1.45 times more likely to use contraception, including FS, as women with two daughters and no sons (77% use of contraception versus 53%).<sup>37</sup> Once a woman has had at least one male child, there is often less pressure on her to continue childbearing. In a study of 263 rural-dwelling women who came to primary health centers in the first half of 2014 to be sterilized, 40.3% of the women gave “satisfied after having a male child” for their main reason for undergoing the procedure, beating out “necessity for good upbringing of other children,” (35.4%) and “economic compulsion,” (24.3%).<sup>35</sup> Two other cross-sectional studies, one in Ahmedabad, Gujarat and one in New Delhi, which interviewed women receiving sterilization services found that the vast majority of couples had sons, with one study having 100% of women with at least one male child and the other with 98.9%.<sup>\*,36,40</sup> Another study, utilizing a longitudinal survey of 416 unsterilized women aged 16-25,

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\* In the study from Ahmedabad, one out of 180 individuals receiving sterilization services was a man.

found that sterilization is motivated more by son preference at lower parities and concerns about large family sizes at higher parities.<sup>41</sup>

### **Pressures from Family**

A number of studies have explored the influence of family members on a couple's reproductive and contraceptive choices in India. In 2005, Char et al. interviewed a son, mother-in-law, and daughter-in-law from 60 families in rural Madhya Pradesh on the influence of family members on contraceptive use decisions.<sup>42</sup> Two thirds of the mother-in-laws stated that they should decide when sterilization of the daughter-in-law would occur, with many expressing that it would only happen after one or two sons were born.<sup>42</sup> Over one half of sons (38) and two thirds of daughters-in-law (44) agreed that the mother-in-law would decide when sterilization occurred. Interestingly, reversible methods were discussed less than sterilization with mothers-in-law, and 17 out of 21 mothers-in-law who knew of reversible methods did not approve of them due to perceived side effects.

### **Increased Autonomy?**

While it has not been thoroughly studied, one paper utilizing NFHS-3 data in Kerala and Tamil Nadu compared indicators for household decision-making and mobility autonomy among married women who had been sterilized, had ever used some form of temporary contraception, or had never used any form of contraception.<sup>38</sup> Controlling for other socio-demographic factors including number of children, economic status, region, and caste,



Pallikadavath et al. found a statistically significant association between contraceptive use, particularly sterilization, and increased autonomy among women under 30. This was not the case for sterilized women above the age of 30, suggesting, according to Pallikadavath et al. that a younger end (pre-30) to the child-bearing period hastened the acquisition of responsibility and authority within the household. This was further corroborated through qualitative interviews with 50 women in two villages in Kerala and Tamil Nadu.<sup>38</sup>

## Quality of Care at Sterilization Camps

Sterilizations are frequently performed at camps, where large numbers of women undergo the operation in relatively short amounts of time. Issues of quality of care in these camps have unfortunately been ongoing for decades. In response to a suit brought by a health rights network (Healthwatch UP Bihar), the Supreme Court of India ruled in 2005 that the states should improve quality of care at camps through, among other things, the creation of state Quality Assurance Committees, and mandated compensation for the families of those who died from botched sterilizations.<sup>11,21</sup> This order was incorporated into the 2005 Family Planning Insurance Scheme and quality standards were updated in 2006.<sup>21</sup>

Despite these government efforts, a number of reports throughout the years have found that conditions in some sterilization camps are often unsanitary and complications, including death, are not so rare.<sup>11,21</sup> Between 2003 and 2012, an official average of 10 deaths occurred per month, which many believe is an underestimate.<sup>43</sup> A 2009 report by

the Centre for Health and Social Justice (CSHJ) studied 17 camps in the states of Rajasthan, Bihar, Uttar Pradesh, Orissa, and Jharkhand through observation and interviews with recently sterilized women, service providers, and district and state-level officials.<sup>21</sup> They found that despite improvements of quality of care after the 2005 ruling, gaps remain. In 2013, *Bloomberg* reported on a sterilization camp in Bihar where rusty instruments were rinsed in warm water between surgeries, the same needle was used on many patients to test for anemia, health workers were without masks, gloves and shoes, and appropriate anesthesia ran out, causing 10 patients to have insufficient sedation.<sup>23</sup>

Additionally, a spate of deaths and injuries in recent years among women operated on at sterilization camps has revealed the priority in many of the camps remains speed and quantity of procedures rather than assuring the safety of the women.<sup>20,23</sup> One high-profile event was the death of 13 women at a sterilization camp in Bilaspur District, Chhattisgarh in November 2014. At the camp, sterilizations were carried out on 83 women in under six hours.<sup>44</sup> A law stipulating that surgeons perform no more than 30 sterilizations a day is often ignored in an effort to receive extra compensation and awards from the government.<sup>44</sup> Strikingly, the physician who performed the operations at the Chhattisgarh camp received an award mere months earlier congratulating him on performing 50,000 sterilization procedures.<sup>45</sup>

A fact-finding team that investigated these deaths found that the surgeon at the Chhattisgarh camp spent on average one to one and a half minutes on each women “with inadequate basic facilities and manpower in an abandoned dirty hospital” and that the “the Ministry of Health and Family Welfare (MoHW) [protocols] had been violated at

every stage.”<sup>20</sup> Interviewing staff inside the camp, they found that they were not aware of quality guidelines provided by the MoHW.<sup>20</sup> While some suggest that the deaths in Chhattisgarh were caused not by human negligence but by faulty medication, the report found that some of the women who died had various indicators (raised levels of procalitonin, peritonitis and septic foci in lungs and kidneys) that would suggest septicemia, or infection, caused by the operation, not from medications.<sup>20</sup> They also write that “according to forensic medicine and toxicology experts, the amount of zinc phosphide [rat poison] required to be lethal for a women is 4.5 grams, which is much higher than what could possibly have been consumed by the women in 500 mg of ciproflaxin” suggesting it would not have been the medicines that independently resulted in the fatalities.<sup>20,46</sup> Numerous outlets reported that the surgical equipment were not sterilized between procedures, which could contribute to infection.<sup>44</sup>

Finally, high quality care consists of more than a sterile procedure. It also requires counseling pre-procedure on the risks and permanent nature of sterilization and post-procedure support. Indeed, though the risk of death is relatively small it can occur, as can failure in approximately one out of 200 cases. From 2008 to March 2012, compensation was paid to families for 18,887 contraceptive failures, 438 complications, and 675 deaths.<sup>47</sup> The CSHJ study from 2009 found that only 9 of the 17 camps surveyed provided counseling pre-procedure and the Human Rights Watch report stated that often women are not informed of the permanent nature of sterilization.<sup>19</sup> Post-procedure, gaps in care remain. In a 2013 West Bengal sterilization camp, 103 women, many unconscious

from anesthesia, were laid out (some accounts say “dumped”) in a field after the hospital ran out of space.<sup>48</sup>

## Post-sterilization: Regret and Adverse Outcomes

### Regret

While the popular use of FS in India is not a new development, an emerging trend is the declining age at which women become sterilized.<sup>49</sup> Since few couples utilize spacing methods, many rely instead on early childbearing in relatively quick succession followed by FS.<sup>49</sup> The average age of FS adopters has fallen from 26.6 years in the 1992-1993 NFHS-1 to 25.5 years in 2005-06.<sup>2,3</sup> In a state like Andhra Pradesh, where FS has increased from 38.1% use among married women of reproductive age in 1992-94 to 62.9% in 2005-06, the average age of FS is now down to 23.3 years.<sup>2</sup> This means that women are having shorter reproductive life spans and shorter birth intervals, which some argue has contributed to the stubborn resistance of the infant mortality rate to decline.<sup>50,51</sup>

Against this backdrop of high FS use at increasingly younger ages, researchers are studying how many and which women suffer from sterilization regret.<sup>49,52,53</sup> Following trends from other countries, sterilization regret is more common among women who are sterilized at younger ages than at older ages.<sup>49,53</sup> Women with fewer children when they are sterilized more frequently report regret than women with more children and women who experience a child loss after sterilization are more likely to experience regret than those who do not.<sup>49,52,53</sup> Additionally, women who have no male children are more likely to experience regret than those who do.<sup>49,53</sup> One study analyzing NFHS-2 data from 1995-

96 in four southern states (Andhra Pradesh, Karnataka, Kerala, and Tamil Nadu) also found that higher quality of services as reported by women was associated with lower sterilization regret, though they suggest that women may report lower levels of satisfaction due to a feeling of regret.<sup>37</sup> Puri et al. did not ask explicitly about “regret” but profiled women requesting sterilization reversal. In that study, 100% of the 96 women interviewed who requested reversals between August 1994 and December 1998 at a Medical Institute in Delhi, did so because of death of one or more children.<sup>40</sup> For 90% of women, the death involved a male child.

While most of the sterilization research in India has focused on individual regions, states or smaller, community-level studies, Singh et al. 2012 analyzed NFHS-3 data from 2005-06. Analyzing 30,999 women who had been sterilized, who had children, and who answered a question on sterilization regret, the study found that across India 5% of sterilized women aged 15-49 experienced sterilization regret.<sup>49</sup> The percentages vary by region and state, with a low of 2.2% of sterilized women reporting regret in Himachal Pradesh and a high of 8.1% in Jammu and Kashmir.<sup>49</sup> After controlling for other variables, women with one child loss after sterilization had 1.58 times the odds (CI:1.37-1.83,  $p<0.05$ ), and women with two losses have 2 times the odds (CI:1.60-2.52,  $p<0.05$ ), of experiencing sterilization regret than women who do not lose any children. While sterilization regret was higher among women with daughters only as compared with sons only (1.28 the odds), it was lowest among women with both sons and daughters (0.77 the odds). This suggests that while son preference exists there is still a desire to have

daughters as well.<sup>49</sup> Finally, women who lived in regions with low fertility were more likely to regret the procedure than women living in areas of high fertility.

## **Adverse Outcomes**

As average age of sterilization declines, some worry about the lack of literature and research done on the long term consequences of early female sterilization.<sup>29</sup> While research exists on adverse outcomes associated with sterilization at young ages in other contexts, including complications, higher failure rates, and greater possibility of hysterectomy, little has been done in the Indian context. In a 2011 Roundtable, the National Coalition on Population Stabilization, Family Planning, and Reproductive Rights pointed out the lack of government initiative in studying these long-term consequences despite promoting sterilization for many years.<sup>29</sup>

## **Recommendations for Intervention**

Following the recommendations of many public health and human rights experts, the Indian government should follow through on its promise to expand access to a variety of non-permanent contraceptive methods. The recent announcement that injectable contraceptives will officially become a part of the family planning program is encouraging, though many warn that it needs to be coupled with a greater commitment to improving public health infrastructure. As it currently stands, FS is so popular in part because of the unavailability of other methods. Improving health infrastructure to enable counseling pre- and post-contraceptive provision, as well as ensuring a steady supply of

these contraceptives moving forward, is crucial to making other contraceptive options viable alternatives to FS, especially for low-income, rural-dwelling women. Not only will the provision of additional methods increase reproductive autonomy, it could increase contraceptive use. A study analyzing 44 countries using Demographic and Health Survey data found that making an additional contraceptive method easily available increases the percentage of married women using a contraceptive method by an average of 3.3 percentage points.<sup>18</sup>

In addition to spacing methods, the government should also further encourage the use of male sterilization, or vasectomy, for couples who do not wish to have more children. The procedure is simpler, safer, and has a failure rate of only .15 percent as opposed to FS's .5 percent.<sup>54</sup> This includes providing information on vasectomy to combat misconceptions (e.g. that it leads to a loss in virility) and on the shared contraceptive responsibility of both parties in a relationship. Several studies have shown there is an interest in vasectomy among men despite a lack of correct information, including a 2010-11 cross-sectional study of 200 married men of reproductive age in Nagpur, with 54% expressing approval for the procedure.<sup>55</sup>

While many argue that FS camps should be abolished altogether, if they are going to continue to be used, it is important the government follow through on its commitment (as declared by the Supreme Court) to ensure safe and appropriate care. This includes increasing the percentage of money that goes to ensuring quality of care at the camps as opposed to just incentives and compensation for healthcare workers. Finally, women

must be made fully aware of the permanent nature of sterilization before the procedure given the risk of sterilization regret.

## Recommendations for Further Research

In a 2000 review on quality of care in the Indian Family Welfare Program, Koenig et al. noted that most of the research done on family planning in India focused on the organization and financing of the system and the associated impacts on contraceptive use, but not much on the quality.<sup>30</sup> Indeed, despite the prevalence of FS in India, less academic research was found than the author expected not only on quality but on the other themes explored here. One glaring absence was the lack of academic research on the use of targets and incentives in encouraging FS use. Only a handful of reports by public health or human rights groups exist, in addition to news articles. Given the concerns raised by these outlets, it seems imperative that research is done in this area to understand the current use of incentives and the ways in which it may influence contraceptive behavior in India.

As raised in the 2011 roundtable of the National Coalition on Population Stabilization, Family Planning, and Reproductive Rights, little research has been done in the Indian context on the health impact of relatively early age FS. Because states like Andhra Pradesh are seeing a decline in the average age of sterilization, it is important to understand the long-term effects of a procedure that's typically performed later in life.



Finally, it is vital that there be research by academics, journalists, and public health and human rights groups to follow up on the Indian government's recent plan to make injectables more widely available. Not only does the method need to be physically available, but proper counseling and follow up has to be provided in tandem to ensure true informed choice and proper quality of care.

## Conclusion

Female sterilization accounts for two thirds of all contraceptive use among women aged 15-49 in India, and has been the leading form of contraception in the country since 1977. Research, in academia, journalism, and from NGOs, has focused on the themes of incentives and targets for FS, socio-demographic factors influencing FS use, quality of care at FS camps, and regret following the procedure.

The path to declining fertility and improving maternal and infant health outcomes ideally is not rapid succession of childbirth followed by sterilization for India's women, but safely spaced births. Research shows that births that are spaced at least three years apart can reduce infant and maternal mortality. As we see FS's continued popularity in India and reproductive life spans shrink in states such as Andhra Pradesh, it is vital that the Indian government take steps to ensure that all women, not just the wealthy few, have access to the kind of birth control that is best for them.

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