

Chapter 5

Factors Influencing Sterilization Use and Outcomes

Highlights:

- Socioeconomic status and the decision to choose sterilization as a contraceptive method do not appear to be associated. There are regional differences, however: In places such as Bangladesh and India, the likelihood of sterilization is greater among couples of lower socioeconomic status, while in Latin America and the Caribbean, couples of higher socioeconomic status are more likely to use sterilization.
- Sterilization users frequently say they chose sterilization for economic reasons or because they had all the children they wanted, although they also attribute their decision to issues such as problems with other contraceptive methods, health factors (such as problems with the last pregnancy) or medical reasons, and method failure.
- Much of the literature suggests that regret is generally low among sterilization users, although rates are high in a few places. Across studies, regret rates range from about 7% in Colombia and the United States to about 17% in Bangladesh and the Dominican Republic.
- Risk factors for sterilization regret can generally be divided into three categories: client characteristics (such as age at sterilization and marital stability), circumstances at the time of sterilization, and changes in clients' characteristics or circumstances after the procedure.

In 1985, EngenderHealth (then the Association for Voluntary Sterilization) commissioned a review and critical analysis of existing literature on voluntary sterilization, to be included in its international fact book on sterilization (Ross, Hong, & Huber, 1985). The summary and findings of that review (Philliber & Philliber, 1985) have for many years provided the most comprehensive overview of studies on sterilization use worldwide.

In summary, the review found that socioeconomic status and religion have little impact on the decision to choose sterilization, but that partners' encouragement and influence do. In terms of outcomes, most sterilization users report being satisfied with the procedure and having experienced little or no change in their sexual activity or marital relations following sterilization; regret is also relatively rare. Risk factors for negative outcomes (such as regret or dissatisfaction) include coercion during decision making, unhappy marital relations, a lack of information about the procedure, and complications resulting from the procedure.

Over the past 15 years, other literature reviews on facets of sterilization have been conducted. Chi and Thapa (1993), for example, examined worldwide literature on postpartum sterilization. Chi and Jones (1994) focused their global analysis on risk factors for poststerilization regret in women. In 1998, EngenderHealth (then AVSC International) conducted a review of the literature on sterilization decision-making factors and outcomes among female users in 17 Latin American and Caribbean nations.¹ Although these works have contributed to the synthesis of knowledge on the antecedents and re-

¹ Bolivia, Brazil, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Puerto Rico, and Trinidad and Tobago.

sults of the sterilization choice, their scope has been somewhat limited, either geographically or thematically.

To gain a better understanding of sterilization-related research in the last 15 years, EngenderHealth staff reviewed the informational database Popline[®] to identify new research on this topic. The review, which was global in focus, examined decision-making factors and outcomes for both female and male sterilization, as identified in both quantitative and qualitative research.² In addition, information from a few selected, unpublished EngenderHealth reports was also included.

This chapter summarizes selected literature on female and male sterilization published since 1985. We consider if the findings of newer research are inconsistent with those identified in the previous global review. In addition, we assess the extent to which the more recent body of literature has addressed the gaps identified by Philliber and Philliber (1985) and identify new areas for future social science research in sterilization.

Factors Influencing Sterilization Use

Myriad factors can influence a couple's decision to end childbearing by means of sterilization. Users' characteristics, societal norms, religious beliefs, family planning policies, economics, fear of child mortality, the sex of living children, and pressure from the partner or family to have more children are some of the factors considered when examining decision making for sterilization.

To augment the data on characteristics of sterilization users drawn from standardized population-based surveys (see Chapter 3) and illustrate the broad range of variables covered, this chapter presents research focusing on additional characteristics of sterilization users. Moreover, most of the information is derived from special studies, which tend to have smaller sample sizes; as a result, this chapter includes findings from studies on vasectomy that, because of the small number of users, might otherwise not be available in population-based studies.

Socioeconomic status

In their 1985 review of the literature, Philliber and Philliber could draw no overarching conclusion about the association between socioeconomic status and the decision to choose sterilization as a contraceptive method. Certain regional patterns emerged, however. The likelihood of sterilization increased with lower socioeconomic status in Bangladesh and India, while higher socioeconomic status was associated with a greater likelihood of sterilization use in Latin America and the Caribbean. In the United States, female sterilization use was more likely among those of lower socioeconomic status, whereas male sterilization use was more common among couples of higher social and economic means.

More recent studies appear to corroborate many of these findings (Table 5.1). Socioeconomic status drops out as a predictor of sterilization use in multivariate analyses, supporting the conclusion that sterilization is not affected by socioeconomic status (Groat, Neal, & Wicks, 1987; Hunt & Annandale, 1990; Miller, Shain, & Pasta, 1986). No overarching pattern is identifiable. In the United States, vasectomy use continues to be associated with higher socioeconomic status (Abma et al., 1997), whereas reliance on female sterilization is linked with lower socioeconomic status (Bumpass, Thomson, & Godecker, 2000; Chandra, 1998; Cushman et al., 1988). Some researchers have speculated that these disparities exist because tubal ligation is easily available in both the private and public sector, while vasectomy is less available in the public sector (Luick et al., 2000). In studies conducted in the Dominican Republic, India, and Nicaragua, no

² In the reference list at the end of this chapter, we have noted the type of approach to data collection used in each study cited. Information from qualitative studies should not be considered generalizable data, but is instead presented to add to the breadth of findings.

Table 5.1. Key findings on relationship between sterilization use, socioeconomic status, and education, by study country, study population, results, and source

Country	Population	Socioeconomic status	Education	Source
Bangladesh	Female tubal ligation users		Largest percentage (83%) had no education	Landry, 1990
Bangladesh*	Couples using vasectomy		More than half of male users had at least some secondary education	Landry & Ward, 1997
Brazil, Colombia, and Mexico	Male vasectomy users		At least some had secondary education	Vernon, 1996
Colombia	Female tubal ligation users		Largest percentage had 1–3 years of education	Williams, Ojeda, & Trias, 1990
Colombia	Female tubal ligation users		Largest percentage (56%) had primary education	Landry, 1990
Colombia†	Female tubal ligation users		Largest percentage (52%) had secondary education or higher	Landry et al., 1992
Dominican Republic†	Female tubal ligation users		Largest percentage (65%) had primary education	Landry et al., 1992
Dominican Republic	Female tubal ligation users	Sterilization distributed equally across all socioeconomic levels	34% had 5–8 years of education and 31% had 1–4 years of education	Loaiza, 1995
El Salvador	Female tubal ligation users		Largest percentage (42%) had 4–6 years of education	Bertrand, Landry, & Zelaya, 1986
El Salvador	Female tubal ligation users		Largest percentage (56%) had primary education	Landry, 1990
Guatemala	Female tubal ligation users		Largest percentage (55%) had primary education	Landry, 1990
India†	Female tubal ligation users		Largest percentage (46%) had no education	Landry et al., 1992
India	Population at large (one community)	No relationship identified between socioeconomic status and sterilization use	No significant difference between users and nonusers of sterilization	Dharmalingam, 1995
Indonesia	Female tubal ligation users		Largest percentage (50%) had primary education	Landry, 1990
Kenya*	Couples using vasectomy		More than half of male users had at least some secondary education	Landry & Ward, 1997
Kenya†	Female tubal ligation users		Largest percentage (53%) had primary education	Landry et al., 1992
Latin America and the Caribbean‡	Female tubal ligation users		Majority had at least some primary school education	AVSC International, 1998
Mali	Female tubal ligation users		Largest percentage (58%) had no education	Landry et al., 1992
Mexico*	Couples using vasectomy		Majority had at least one year of secondary education	Alarcon et al., 1995
Mexico*	Couples using vasectomy		More than half had at least some secondary education	Landry & Ward, 1997
Nepal	Female tubal ligation users		Largest percentage (79%) had no schooling	Thapa & Friedman, 1998

(cont'd.)

Table 5.1. Key findings on relationship between sterilization use, socioeconomic status, and education, by study country, study population, results, and source (cont'd.)

Country	Population	Socioeconomic status	Education	Source
Nicaragua	Population at large	No significant difference between users and nonusers of sterilization		Zelaya et al., 1996
Puerto Rico	Female tubal ligation users		43% had 0–8 years of education; 23% had a high school diploma only	Boring, Rochat, & Becerra, 1988
Rwanda*	Couples using vasectomy		Majority of male users had completed some level of primary education	Landry & Ward, 1997
Scotland	Female population at large	Inverse relationship between sterilization use and socioeconomic status (significant in univariate analysis, but not in multivariate analysis)		Hunt & Annandale, 1990
Senegal	Female tubal ligation and Norplant implant users		Largest percentage of tubal ligation users (63%) had no education	Diadhiou et al., 1994
Sri Lanka	Couples using vasectomy		Majority of male users had completed some level of primary education	Landry & Ward, 1997
Tunisia	Female tubal ligation users		Largest percentage (75%) had no education	Landry, 1990
Turkey	Female tubal ligation users		Largest percentage (77%) had primary education	Landry et al., 1992
United States	Female vasectomy and tubal ligation users	No significant difference between female vasectomy and tubal ligation users		Shain, Miller, & Holden, 1985
United States	Population at large (married couples in one city)		Education was not a predictor of use vs. nonuse; education was a predictor in choice of sterilization (husband's higher education was associated with vasectomy use)	Groat, Neal, & Wicks, 1987
United States	Female tubal ligation users and nonusers wanting no more children	Inverse relationship between sterilization and socioeconomic status (significant difference)		Cushman et al., 1988
United States	Couples using vasectomy		All but two male users had completed secondary school	Landry & Ward, 1997
United States	Male vasectomy users	Average annual income of male users was \$50,000–\$75,000	48% had bachelor's degree or higher; almost all had completed high school	Luick et al., 2000

* Qualitative study.

† Study was limited to postpartum women.

‡ Bolivia, Brazil, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, and Trinidad and Tobago.

Note: Empty space indicates that the study did not report information on the variable.

conclusive evidence linked socioeconomic status to sterilization use (Dharmalingam, 1995; Loaiza, 1995; Zelaya et al., 1996).

Religion

Sterilization is used by people from a broad variety of religious faiths (Bertrand et al., 1991; Campos Machado, 1996; Cleland & Mauldin, 1991; Hunt & Annandale, 1990; Khan & Patel, 1997; Stycos, 1984). In some cases, even though a religion may restrict or forbid the use of sterilization as a family planning method, followers will still use it. For example, even though Roman Catholicism prohibits use of contraceptive sterilization, the method is widely used in the overwhelmingly Catholic Latin American and Caribbean region (Stycos, 1984).

Opposition to the use of sterilization also has been noted among Muslim groups in India and the Philippines (Population Council, 1993; Khan & Patel, 1997). Many countries where sterilization prevalence is low are located in the Middle East, in North Africa, and in Sub-Saharan Africa. The low prevalence in these countries may be a product of sterilization policies based on the strict interpretation of Islam or on individual opposition to sterilization. (See Chapter 4 for more information on sterilization within Islamic law.) Nevertheless, in a few predominantly Muslim countries, such as Bangladesh and Tunisia, sterilization represents a fair portion of contraceptive use.³

A few recent studies have used multivariate analysis to explore the importance of religion in sterilization decision making. Among these, an analysis of 1995 U.S. data from the National Survey of Family Growth (NSFG) found a significantly lower likelihood of tubal sterilization among Catholic wives than among non-Catholic wives (Bumpass et al., 2000). In Hunt and Annandale's study of women in Scotland (1990), the association between being Protestant and not choosing sterilization was strong in the bivariate analysis, but disappeared in the multivariate models.

Marital or union status

In general, most women and men who use sterilization tend to be in union, though this may reflect the study populations chosen, since nearly all studies that we examined focused on women in union. One U.S. study indicated that married women were more likely to use a permanent method than were unmarried women—48% and 11%, respectively (Forrest & Fordyce, 1993). Nevertheless, sterilizations among unmarried women do not appear to be unusual; another U.S. study found that one in three sterilizations took place among unmarried women (Bumpass et al., 2000).⁴ Table 5.2 (page 112) indicates the marital or union status of participants in recent studies on sterilization use.

Number of children

According to Philliber and Philliber (1985), sterilization is most common among high-parity couples. Couples in Asia and Latin America who used sterilization averaged 4–5 children, whereas those in Canada, Europe, and the United States had smaller families. Although the differences between developed and developing regions largely continue today, recent literature suggests that the gap between regions has narrowed. The number of living children among sterilization users in Asia and Latin America now peaks at 3–4 rather than at 4–5. In fact, in Brazil, Colombia, and the Dominican Republic, a large number of sterilization users report having been sterilized after 2–3 children (AVSC International, 1998b; Loaiza, 1995). Sterilization users in

³ In Bangladesh, data from the 1996 Demographic and Health Survey indicate that sterilization represents nearly 50% of all contraceptive use. In Tunisia, the 1994 PAPCHILD survey shows that close to 60% of contraceptive use can be attributed to sterilization (see Chapter 2).

⁴ In this study, the “unmarried” category combined women who were never married with those who were formerly married and who were cohabiting (either formerly married or never married).

Table 5.2. Key findings on relationship between sterilization use and selected life-cycle variables, by study country, study population, results, and source

Country	Population studied	Age at sterilization	Marital/union status	Presence of son/daughter	Source
Bangladesh	Female users of tubal ligation			Respondents averaged 2.1 male children and 1.8 female children	Landry, 1990
Bangladesh*	Couples using vasectomy			Majority had children of both sexes	Landry & Ward, 1997
Brazil	Female users and nonusers of tubal ligation		86% were in union; 67% of nonusers were married		Barbosa & Villela, 1995
Brazil	Female users of tubal ligation	In Alcantil, 37% were 25–29, 26% were 30–34; in Caapora, 34% were 20–24, 33% were 25–29			Rodrigues & Moji, 1995
Brazil	Female users of tubal ligation	Median of 28; 94% were <35; 65% were <30	93% were in union		Vieira & Ford, 1996
Brazil, Colombia, and Mexico	Vasectomy users		Nearly all were in union		Vernon, 1996
Colombia	Female users of tubal ligation			Respondents averaged 1.8 male children and 1.6 female children	Landry, 1990
Dominican Republic	Female users of tubal ligation	When sterilized, 36% were 25–29, 28% were 30–34, 23% were 20–24			Loaiza, 1995
El Salvador	Female users of tubal ligation	Mean of 28	63% were in union		Bertrand, Landry, & Zelaya, 1986
Guatemala	Female users of tubal ligation			Respondents averaged 2.2 male children and 2.1 female children	Landry, 1990
India	Population at large (one community)	Half were 30–39, half were 20–29			Dharmalingam, 1995
Indonesia	Female users of tubal ligation			Respondents averaged 2.4 male children and 2.3 female children	Landry, 1990
Kenya*	Couples using vasectomy			Majority had children of both sexes	Landry & Ward, 1997
Latin America and the Caribbean†	Female users of tubal ligation	Majority were sterilized at 25–34			AVSC International, 1998b
Mexico*	Vasectomy users and their wives	Mean of 31			Alarcon et al., 1995
Mexico*	Couples using vasectomy			Majority had children of both sexes	Landry & Ward, 1997
Nepal	Female users of tubal ligation	36% were 25–29; 25% were 15–24; 21% were 30–34		74.5% had at least one son and 68.4% had at least one daughter	Thapa & Friedman, 1998

(cont'd.)

Table 5.2. Key findings on relationship between sterilization use and selected life-cycle variables, by study country, study population, results, and source (cont'd.)

Country	Population studied	Age at sterilization	Marital/union status	Presence of son/daughter	Source
Rwanda*	Couples using vasectomy			Majority had children of both sexes	Landry & Ward, 1997
Sri Lanka*	Couples using vasectomy			Majority had children of both sexes	Landry & Ward, 1997
Sweden	Male users of vasectomy	Mean of 39	98% were in union		Ehn & Liljestrand, 1995
United States	Female users of vasectomy and tubal ligation	Tubal ligation users were about 1 year older than vasectomy users			Shain, Miller, & Holden, 1985
United States	Female users of vasectomy and tubal ligation		Yes		Miller, Shain, & Pasta, 1986
United States	Female users and nonusers of tubal ligation, both of whom wanted no more children	Mean of 28.4 for both those planning and those not planning to be sterilized			Cushman et al., 1988
United States	Female users of tubal ligation	30% were 30–34; 28% were 25–29; 26% were 34 or older	63% were in union		Wilcox et al., 1991
United States	Couples using vasectomy or tubal ligation	Mean of 32.5			Miller, Shain, & Pasta, 1991a
United States	Couples using vasectomy or tubal ligation	Mean of 32.5			Miller, Shain, & Pasta, 1991b
United States*	Couples using vasectomy			Majority had children of both sexes	Landry & Ward, 1997
United States	Female population at large		Significantly high proportions of tubal ligation among unmarried women; 1 in 3 overall, 1 in 5 among white, non-Hispanic women, 2 in 3 among black women		Bumpass, Thomson, & Godecker, 2000
United States	Male users of vasectomy	Mean of 35.6	91% were in union		Luick et al., 2000
Zaire‡	Female users of tubal ligation	Mean of 36.9	92% were in union	98% had at least one son and one daughter	Bertrand et al., 1991

* Qualitative study.

† Bolivia, Brazil, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, and Trinidad and Tobago.

‡ Now the Democratic Republic of Congo.

Note: Empty space indicates that the study did not report information on the variable.

Africa report higher numbers of living children than do those in Asia and Latin America, with numbers among African women averaging five or more (Bertrand et al., 1991; Diadhiou et al., 1994).

Among users of permanent methods, vasectomy users appear to have fewer children than do tubal ligation users. Among vasectomy users in Brazil, Colombia, and Mexico, for example, researchers found that clients had fewer than three children (Vernon, 1996). In Miller, Shain, and Pasta's U.S. study (1986), those relying on vasectomy had fewer living children (2.1) than did those using female sterilization (2.4).

Sex of children

Coupled with parity, the sex of children also continues to remain an important factor affecting the choice of sterilization. Sterilization users in a number of studies and across countries (including Bangladesh, Colombia, Guatemala, Indonesia, Kenya, Mexico, Nepal, Rwanda, Sri Lanka, the United States, and Zaire, now the Democratic Republic of Congo) had at least one child of each sex (Bertrand et al., 1991; Landry, 1990; Landry & Ward, 1997; Thapa & Friedman, 1998). Table 5.2 indicates the presence of a son or a daughter among sterilization users in recent studies.

Age at sterilization

In general, population-based survey data show the median age at sterilization for female users to be somewhat higher in Africa than it is in Asia, Latin America and the Caribbean, and North America. (See Chapter 3 for more information.) Most men who use vasectomy report having been in their mid-to-late 30s when they underwent the procedure (see Table 5.2).

Among U.S. researchers who have examined differences in age at sterilization between users of tubal ligation and vasectomy, Shain, Miller, and Holden (1985) found that married women undergoing tubal ligation were approximately one year older than wives of vasectomy users. A study examining findings from the 1995 NSFG found that vasectomy is more common among the husbands of women who are in their late 20s; in general, tubal sterilization is more common among women who have younger husbands (Bumpass et al., 2000).

There also are differences in age at sterilization between postpartum and interval tubal ligation clients in the United States (MacKay et al., 2001). The authors of that study concluded that postpartum sterilizations were highest among women aged 25–29, while interval sterilizations were highest among those aged 30–34. Researchers suggest that this trend reflects childbearing trends, in which most women have the number of children they want by age 35.

Race and ethnicity

Most research examining the importance of race and ethnicity as factors in sterilization use has been undertaken in the United States (Table 5.3). Although race is not identified as a predictive factor in the decision to choose sterilization, it is related to the type of sterilization chosen (Chandra, 1998). Female sterilization remains widely used among black, Hispanic, and white women alike, but is most common among black women (Mosher & Pratt, 1990). Within this group, tubal sterilization is common among both married (37%) and never-married women (31%). Although Cushman et al. (1988) also studied U.S. women, they observed a different relationship, with female sterilization use highest among white and Hispanic women and lowest among black women; the authors speculate that differences in social class may have contributed to this discrepancy. A comparison of island-born and U.S. mainland-born Puerto Rican women with the population of sterilization users at large revealed that Puerto Rican women born on the U.S. mainland rely on sterilization at a rate comparable to that of the U.S. population, whereas island-born Puerto Rican women have higher rates (Salvo, Powers, & Cooney, 1992). The authors recommended additional research to determine if these differences

Table 5.3. Key findings on relationship between sterilization use and race and ethnicity, by study country, study population, results, and source

Country	Population studied	Race and ethnicity	Source
Australia	Lebanese, Turkish, and Vietnamese immigrant women	15–16% of Lebanese and Turkish immigrant women and 9% of Vietnamese women had undergone sterilization, compared with a higher percentage among Australian women; only two women (both Vietnamese) reported using vasectomy	Yusuf et al., 1993
Puerto Rico and United States	Puerto Rican women in New York and in Puerto Rico	30% of Puerto Rican women born in the New York area were using tubal ligation, compared with 26% born in Puerto Rico and 13% of all U.S. women; 0.1% of Puerto Rican women born in the New York area reported using vasectomy, compared with 3% born in Puerto Rico and 6.1% of all U.S. women	Salvo, Powers, & Cooney, 1992
United States	Female tubal ligation users and nonusers, both of whom wanted no more children	Percentage of women planning to use sterilization was higher among Hispanics and whites than among blacks, who were in the majority (62%)	Cushman et al., 1988
United States	Couples using vasectomy and tubal ligation	71% were white, 13% were Hispanic, 8% were Asian, 3% were black, and 5% were “other”	Miller et al., 1991
United States	Population at large	Black men were less likely to use vasectomy than were white men (1% vs. 10%)	Abma et al., 1997
United States	Female users of tubal ligation	Rates of postpartum and interval sterilization were higher for black women than for white women, but only rates for postpartum sterilization were significant	MacKay et al., 2001
United States	Male users of vasectomy	90% of vasectomy users were white, 5% were black, and 5% were Hispanic	Luick et al., 2000

are cultural, are related to socioeconomic status, or are caused by variations in the availability of methods and services.

A study of tubal ligation clients in the United States between 1994 and 1996 (MacKay et al., 2001) determined that postpartum and interval sterilization rates were higher for black women than for white women; however, only the differences in postpartum rates were found to be statistically significant. The researchers suggest that these race-related differences in sterilization rates may be linked to white women’s greater reliance on vasectomy than on tubal ligation (9.8% vs. 1.2%).

In the United States, male sterilization is used most widely by white men. Bumpass et al. (2000) found that while use of vasectomy among white men has grown over time, it has remained fairly steady among black men. They suggested that black women’s greater use of tubal sterilization than vasectomy may be linked to the higher prevalence of female-headed households. Other reasons for the lower use of vasectomy services among black men include a lack of information about vasectomy, a lack of available vasectomy services in the public sector (which mostly serves minority groups), and traditions in the black and Hispanic community, where women have historically borne the responsibility for family planning (Luick et al., 2000).

Social and psychological factors

Regardless of geography, sterilization users frequently say they chose sterilization for economic reasons or because they had all the children they wanted (Alarcon et al., 1995; Bertrand et al., 1991; Diadhieu et al., 1994; Hunt & Annandale, 1990; Landry & Ward, 1997; Loaiza, 1995; Mumford, 1983; Vieira & Ford, 1996; Williams, Ojeda, & Trias, 1990). Problems with other contraceptive methods, health factors (such as problems with the last pregnancy) or medical reasons, and method failure are also mentioned, though to a lesser extent (Alarcon et al., 1995; Barbosa & Villela, 1995; Bertrand et al., 1991;

Chibalonza, Chirhamolekwa, & Bertrand, 1989; Diadhiou et al., 1994; Ehn & Liljestrand, 1995; Hunt & Annandale, 1990; Landry, 1990; Landry & Ward, 1997; Loaiza, 1995; Luick et al., 2000; Miller, Shain, and Pasta, 1991b; Vieira & Ford, 1996; Williams et al., 1990). These factors only partly describe why people choose sterilization, however. As Philliber and Philliber (1985) note, “people cannot always explain why they decide to have a sterilization, and often they give superficial reasons.” Further understanding requires additional knowledge about sources of influence, about information on and attitudes toward sterilization, and about alternative contraceptive methods, among other factors.

Sources of information and influence

Among tubal ligation users in Brazil, Colombia, Kenya, and the United States, friends, relatives, other sterilization users, and health care workers (including family planning workers) appear to be important sources of information (Bertrand et al., 1991; Vieira & Ford, 1996; Williams et al., 1990). Many vasectomy users in Bangladesh, Brazil, Colombia, Kenya, Mexico, Rwanda, and the United States similarly noted the importance of “significant others” and health workers in providing them with information about the procedure (Alarcon et al., 1985; Landry & Ward, 1997; Luick et al., 2000; Vernon, 1996). In some countries, particularly those with vasectomy information campaigns (such as Bangladesh, Brazil, Colombia, Kenya, and Mexico), health care workers played a particularly prominent role as information-givers (Alarcon et al., 1995; Landry & Ward, 1997; Vernon, 1996). The importance of other vasectomy users was particularly highlighted in studies in the United States, as well as in Brazil, Colombia, and Mexico (Miller et al., 1991b; Mumford, 1983; Vernon, 1996). The media (television, radio, and, in the United States, the Internet) have also been cited as an important source of information among vasectomy users in Brazil, Colombia, Mexico, and the United States (Alarcon et al., 1995; Luick et al., 2000; Vernon, 1996).

Besides being sources of information, family, friends, and health care workers may also influence the decision to choose sterilization. Most female sterilization users participating in focus groups in Zaire stated that they chose sterilization upon the recommendation of health care providers, who suggested they obtain sterilization for medical reasons (Chibalonza et al., 1989); few women consulted with friends, as this decision was deemed a confidential one. In Nepal, women who were not using contraception noted that vasectomy was not an option because they feared family disapproval (Shrestha, Stoeckel, & Tuladhar, 1988). In rural Bangladesh, the likelihood of sterilization use within a household increases if the head of the extended family dwelling unit (or *bari*) himself has ever used contraception, either permanent or temporary (Kamal, 1996). Tubal ligation users in Senegal described their husbands as being influential in their decision to choose sterilization, while friends and neighbors played a minimal role (Diadhiou et al., 1994). In Colombia, two-thirds of female sterilization users identified their partner as the second most important influence in their decision-making process (citing themselves as most important) (Williams et al., 1990).

Male partners may also be influential in the decision not to choose sterilization. Among Honduran women who never fulfilled their plans for sterilization, about 50% of respondents in Tegucigalpa and 22% in San Pedro Sula reported that they did not obtain a sterilization because of their husband’s opposition (Janowitz et al., 1985). Similarly, in Jamaica, among women who broke their appointments for sterilization, some stated that despite their desire to limit births, they felt unable to broach the issue of sterilization with their partner (Bailey et al., 1994).

Contraceptive knowledge and previous contraceptive experience

Chapter 3 provides information on prior contraceptive use among female sterilization users, as derived from population-based data. According to the literature, with a few exceptions, sterilization users generally know about and in many cases have used other methods (see Table 5.4). Landry’s (1990) six-country review of female sterilization use (in

Table 5.4. Key findings on relationship between sterilization use and contraceptive knowledge and previous contraceptive experience, by study country, study population, results, and source

Country	Population studied	Knowledge of at least one other method	Previous contraceptive use	Experience with contraceptive failure	Source
Bangladesh	Female users of tubal ligation	100%	27%		Landry, 1990
Bangladesh*	Couples using vasectomy	Majority knew of another method	Majority had used a method		Landry & Ward, 1995
Brazil	Female users and nonusers of tubal ligation		42% of users and 37% of nonusers had used another method	47% of sterilized women, compared with 23% of nonusers	Barbosa & Villela, 1995
Brazil	Female users of tubal ligation	100%	85%	43%	Vieira & Ford, 1996
Brazil, Colombia, and Mexico	Male users of vasectomy		56–98%		Vernon, 1996
Colombia	Female users of tubal ligation	99%	78%		Williams et al., 1990
Dominican Republic	Female users of tubal ligation		67%		Loaiza, 1995
El Salvador	Female users of tubal ligation	98%	65%		Bertrand, Landry, & Zelaya, 1986
El Salvador	Female users of tubal ligation	98%	65%		Landry, 1990
Guatemala	Female users of tubal ligation	94%	58%		Landry, 1990
India	Population at large (one community)	Most were not aware	None		Dharmalingam, 1995 (<i>cont'd.</i>)

Bangladesh, Colombia, El Salvador, Guatemala, Indonesia, and Tunisia) noted that all respondents knew of at least one method besides tubal ligation, and about half in all countries except Bangladesh had previously used a contraceptive method (including withdrawal). In Colombia, 91% of tubal ligation users knew of other contraceptive methods, and 88% of those had used another method, usually the pill (46%) (Williams et al., 1990).⁵

Hunt and Annandale (1990) found high levels of prior experience with contraception, particularly with the intrauterine device (IUD) and the pill, among tubal ligation users in Scotland. Previous contraceptive experience was similar among wives of vasectomy users in that study, though these women used the IUD less often than did women relying on tubal sterilization. Some researchers attribute this association between pill or IUD use and sterilization use to the former methods' high effectiveness standard; when the desired parity has been met, only sterilization is deemed capable of exceeding that standard when clients have "little tolerance for failure" (Bumpass et al., 2000; Hunt & Annandale, 1990).

Studies in Kenya and the Dominican Republic similarly report that tubal ligation users know about and have experience with other contraceptive methods (Bertrand et al., 1989; Loaiza, 1995). In comparison, researchers in Nepal found prior use of contraception to be low, with about 80–82% of women reporting that female sterilization was the

⁵ Knowledge of family planning in general is high among most women of reproductive age in Colombia, with more than 50% able to name nine contraceptive methods (Rutenberg et al., 1991).

Table 5.4. Key findings on relationship between sterilization use and contraceptive knowledge and previous contraceptive experience, by study country, study population, results, and source (cont'd.)

Country	Population studied	Knowledge of at least one other method	Previous contraceptive use	Experience with contraceptive failure	Source
Indonesia	Female users of tubal ligation	100%	73%		Landry, 1990
Kenya*	Couples using vasectomy	Most were aware	Majority had used another method		Landry & Ward, 1997
Latin America and the Caribbean†	Female users of tubal ligation		13–46% had only used sterilization		AVSC International, 1998
Mexico*	Couples using vasectomy		Majority had used another method		Alarcon et al., 1995
Mexico*	Husbands and wives using vasectomy	Most were aware	Majority had used another method		Landry & Ward, 1997
Nepal	Female users of tubal ligation	92% of those sterilized in the hospital; 92% of those sterilized in camps	19% had used another method, 20% of those sterilized in the hospital and 18% of those sterilized in camps		Thapa & Friedman, 1998
Rwanda*	Couples using vasectomy	Most were aware	Majority had used another method		Landry & Ward, 1997
Sri Lanka*	Couples using vasectomy	Most were aware	Majority had used another method		Landry & Ward, 1997
Tunisia	Female users of tubal ligation	98%	62%		Landry, 1990
United States*	Couples using vasectomy	Most were aware	Majority had used another method		Landry & Ward, 1997
Zaire‡	Female users of tubal ligation	96%	67%		Bertrand et al., 1991

* Qualitative study.

† Bolivia, Brazil, Colombia, the Dominican Republic, Guatemala, Paraguay, and Peru.

‡ Now the Democratic Republic of Congo.

Note: Empty space indicates that the study did not report information on the variable.

first method they had ever used (Thapa & Friedman, 1998). Landry and Ward (1997) found that among vasectomy users in six countries, knowledge of and prior use of other contraceptive methods was nearly universal; female and male respondents reported having used at least one other modern method, on average. Miller, Shain, and Pasta (1991b) observed in their U.S. study that methods previously used by vasectomy clients were usually those requiring greater male involvement and planning: Couples using vasectomy had primarily used methods such as the condom and the diaphragm, whereas those using tubal ligation were more likely to have used methods requiring less planning, such as the IUD or withdrawal.

Misconceptions and misinformation

Misconceptions and misinformation about tubal ligation, vasectomy, and other contraceptive methods may either encourage or discourage an individual's decision to utilize

sterilization. Misconceptions regarding vasectomy are the most notable. In a study conducted in Uttar Pradesh, India, men, women, and even providers stated that female sterilization is easier to perform and has fewer complications than vasectomy (Centre for Operations Research and Training, 2000). Focus-group participants in Nepal expressed similar concerns (Shrestha et al., 1988). Similarly, respondents participating in studies in Bangladesh, Brazil, Kenya, and Nepal expressed fears that men who obtained a vasectomy would experience physical and sexual impotence and would be less able to perform physical labor (Bertrand et al., 1989; Schuler, Hashemi, & Jenkins, 1995; Shrestha et al., 1988; Vieira & Ford, 1996).

Education is an important factor in clarifying myths about vasectomy (Guzman Garcia, Snow, & Aitken, 1994; Landry & Ward, 1997). Vasectomy users in Landry and Ward's six-country study (1997) observed that correct information from providers and from other vasectomized men was important in counteracting negative comments expressed by friends and family.

Misconceptions about tubal ligation also exist. Three out of 10 focus groups from one study in Mexico reported nervousness and insanity as two side effects related to female sterilization (Guzman Garcia et al., 1994). In Nepal, focus-group participants expressed concern that tubal ligation would physically weaken women (Shrestha et al., 1988). In the United States, a comparative study of prospective sterilization users and nonusers (Cushman et al., 1988) revealed a number of concerns among nonusers, including fear of scarring, loss of femininity, and emotional upset. Nearly one-third cited adverse effects from anesthesia as a concern. In addition, many of the women believed they would face logistical problems, such as the need for several clinic visits and high costs (even though public assistance would probably have covered the cost of the service for many of these women). Among women in Kenya, many stated that tubal ligation leads to diminished interest in sex (Bertrand et al., 1989).

Future expectations about life after the procedure may also influence women's decision to choose sterilization. In Zaire (now the Democratic Republic of Congo), users of temporary methods stated that they would continue using temporary methods, rather than a permanent one, because of the fear of being abandoned by their husbands (Chibalonza et al., 1989).

Positive expectations may also be associated with sterilization. In one U.S. study, for example, sterilized women were more likely than nonsterilized women to believe that having a sterilization procedure would improve their family life, facilitate their education and personal development, and better their sex life (Cushman et al., 1988). Researchers noted that some women may not realize these high expectations, resulting in disappointment, especially with the method.

In some instances, men and women may choose sterilization as a result of their perceptions, experiences, or information about other methods. The majority (70%) of women interviewed in a Brazilian study (Vieira & Ford, 1996) felt that sterilization is the only reliable method. Seventy-nine percent said that the condom is unreliable and 40% that oral contraceptives fail, even if taken properly; many of these perceptions may have been based on personal experiences with the method, especially given the fact that 43% reported they had experienced contraceptive failure with the pill. Sixty-four percent stated that all methods affect women's health. A study of physicians, also conducted in Brazil, indicated that physicians recommend tubal ligation or vasectomy to couples who fear side effects of other methods or want no more children (Bailey et al., 1991).⁶ In Scotland, negative media coverage of the pill in the 1980s and 1990s was deemed a factor in the noted increase in sterilization use there (Hunt & Annandale, 1990).

Among women interviewed in Brazil and Mexico, sterilization becomes the method of choice because of its finality (Zelaya et al., 1996), the women's dissatisfaction with

⁶ As was noted in Chapter 4, large numbers of sterilizations have been performed in Brazil, despite a lack of clarity over the procedure's legal status that existed until the 1996 enactment of a law permitting sterilization for contraceptive purposes.

or distrust of other methods (Grilo-Diniz, de Mello e Souza, & Portella, 1998), or the lack of access to other contraceptives (Ortiz-Ortega, Amuchástegui, & Rivas, 1998), especially where abortion is illegal and unsafe.

Factors related to gender, culture, and empowerment

In the past 15 years, a number of studies have examined sterilization and decision making within the scope of gender, culture, and empowerment. Men's and women's roles in society may affect the acceptability of both the decision to terminate fertility and the method chosen. As previously mentioned, husbands, family members, and health care providers are often cited as influential players in the decision-making process, and much of the literature reveals that power dynamics within these relationships—particularly between men and women—influence the decision-making process.

In Southern India, men's opposition to female sterilization stemmed from an attempt to maintain control over their wives (Dharmalingam, 1995). Men appeared to believe that female sterilization makes it easier for women to have extramarital relations, generating suspicion among husbands and general familial tension. Neither vasectomy nor the condom was a contraceptive option because of men's disapproval of these methods. In a study in six rural villages in Bangladesh, Schuler et al. (1995) described how women circumvent expressing their own desires for family planning, including sterilization, by telling their husbands that family planning workers recommended contraceptive use.

Power dynamics may also affect the type of permanent method that couples select. In Kenya, researchers found that most men and women whom they interviewed knew about vasectomy but never considered it an alternative method of sterilization because of assumptions about women's childbearing roles. Some reported that because Muslim law permits men to divorce and remarry, Muslim men would oppose vasectomy, since having the procedure done would close off any opportunity to have more children with new wives (Bertrand et al., 1989). In addition, some women never suggested vasectomy to their husbands because they feared their husbands would abuse them for discussing it. In Landry and Ward's six-country qualitative study of vasectomy use (1997), some vasectomy users in Bangladesh and Sri Lanka excluded their partners from the decision-making process because they considered themselves the heads of households and in charge of making those decisions.

In comparison, couples from Bangladesh, Kenya, Mexico, Rwanda, Sri Lanka, and the United States who were using vasectomy viewed contraceptive use within their relationship as an equitable pact. These couples perceived contraceptive use for birth spacing as the female partner's responsibility. Once family size was complete, it became the "man's turn" to contribute to family planning through the use of sterilization (Alderman, 1988; Groat et al., 1987; Landry & Ward, 1997; Luick et al., 2000).

Studies in Brazil, Honduras, and Mexico found that among female respondents, sterilization may represent an attempt to "take control over one's body and reproduction" (Grilo-Diniz et al., 1998; Ortiz-Ortega et al., 1998; Zelaya et al., 1996). Temporary methods may not be seen as an option at the onset of sexual relations, either because of the woman's inability to "negotiate more flexible forms of contraception," because she perceives contraception as "sinful," or because she sees herself fulfilling the traditional childbearing role deemed natural by her culture. After having at least two children, women assume a more active role in controlling their fertility, since they have completed their childbearing duties.

In many cultures, age or one's phase in life may be seen as a way of advancing one's position within existing power structures. Saavala (1999) found that female sterilization users in one southern Indian village were using the procedure as an artificial means of advancing their age. There, young women sought sterilization as a means of indirectly challenging their mothers-in-law and obtaining the prestige and seniority associated with the nonprocreative phase of life. This use of sterilization to advance one's age contributed to a trend toward younger age at sterilization in the community.

Informed choice and consent

Chapter 1 discusses many of the concepts as well as ethical and quality issues concerning informed choice and consent. In summary, informed choice refers to a client's health care decision making, made in an environment in which the client has full understanding, knowledge, and available options regarding treatment or methods. Coercion, incentives, payments, and quotas are a few of the more commonly discussed obstacles to full and voluntary decision making. Imbalances in power and knowledge (both within and outside of the health system), a lack of information, providers' adherence to medical models, and a lack of real method choice also undermine informed choice in sterilization decision making (AVSC International, 1999). It is worth noting that these obstacles may be products not only of the health system, but also of relationships in communities and families, as well as relationships between partners.

Within the context of sterilization, informed consent means that a user is aware of the nature of the sterilization procedure and grants his or her consent voluntarily, without "inducement, force, fraud, deceit, duress, bias, or other forms of coercion or misrepresentation" (AVSC International, 1998a). Allegations of informed consent abuses in sterilization have long existed. In the United States, until about World War II, women who were poor, disabled, or from non-European countries were sometimes sterilized involuntarily (Moskowitz, Jennings, & Callahan, 1995; Reilly, 1991). Many of these same groups also faced violations in such countries as Denmark, Japan, Norway, and Sweden (Anonymous, 1997; Ramsay, 2000). Bauza (1994) states that informed consent abuses occurred in Puerto Rico during the 1940s. One of the best-documented instances of abuse was in India during the 1970s, when women and men alike were sterilized during a series of campaigns (Saavala, 1999).

Over the past 15 years, newspaper articles have reported allegations of informed consent abuses among women and men in countries such as Bangladesh, El Salvador, Guatemala, Mexico, Peru, and the United States, among others. Abuses have also been reported in India, despite the elimination of sterilization campaigns. In response, a number of studies have examined voluntarism in the decision to choose sterilization (Bertrand, Landry, & Araya Zelaya, 1986; Bertrand et al., 1991; Cleland & Mauldin, 1991; Landry, 1990; Perea, 1994; Saavala, 1999). In general, these studies concluded that decisions about sterilization appear to have been made voluntarily, though exceptions do exist. Ten percent of sterilized women participating in a national survey in Mexico reported that they had not been involved in the process of choosing sterilization (Perea, 1994). One study in Guatemala reported pressure from husbands (Landry, 1990). In Zaire, 14% of female sterilization users interviewed reported that they had felt pressured to choose sterilization, with more than half indicating they were pressured by their husbands and 37% by their physicians (Bertrand et al., 1991).

Incentives and disincentives have also existed in a number of countries, such as Bangladesh, China, France, and India, as a means of either encouraging or discouraging small families (Freedman & Isaacs, 1993). These may be directed at both users and providers, and they may vary in type (e.g., as money or as goods) as well as in intent (as an outright means of influencing decisions or as compensation for lost time or employment). In general, the importance of incentives in motivating individuals to choose sterilization seems minimal, though this may be because only a few studies have explored this issue. For example, in India, Saavala (1999) found that the poor women interviewed reported that "undergoing sterilization just for the money would make no sense," because of the surgical risk of the procedure.

Payments to clients, rather than being considered incentives, are viewed as compensation for their time and travel. Two studies noted similar results in Bangladesh. In one (Landry, 1990), one-third of female users stated that although compensation contributed to their decision to choose sterilization, they would have done so regardless of whether the payment was available. In the other (Cleland & Mauldin, 1991), for users of both tubal ligation and vasectomy, monetary incentives were judged to act "as an additional spur to action, only when there is a latent desire to stop having more

children.” Although money may contribute to the decision (a pattern noted more frequently among men than among women), it is rarely the only motivational factor. In addition, the study suggested that incentives offered to self-employed recruiters pose a greater threat to choice, since the recruiters will often provide inaccurate information about sterilization and promote this method exclusively.

Other barriers to informed choice are a lack of knowledge about and access to alternative contraceptive methods. Studies conducted in Bangladesh, Brazil, Colombia, El Salvador, Guatemala, Indonesia, Mexico, and Tunisia (Landry, 1990; Perea, 1994; Vieira & Ford, 1996) have cited a lack of information about alternative contraceptive methods (usually temporary methods). Also, a lack of awareness regarding the intended permanence of sterilization has been noted in Brazil, the Dominican Republic, and the United States (Cushman et al., 1988; Loaiza, 1995; Vieira & Ford, 1996).

Informed choice may also be compromised if adherence to medical models takes precedence over a full understanding of a client’s needs and preferences (AVSC International, 1999). Physicians in Brazil appear to have recommended postpartum sterilization to “high-risk” maternity clients, in some cases without providing adequate counseling (Berquo et al., 1996; Marques, 1996). The risks of future pregnancy cited may include advancing age, a history of three or more cesareans, difficult deliveries, and chronic diseases (Berquo et al., 1996; Rodrigues & Moji, 1995). Although doctors who recommended sterilization for clients with these risk factors may have been acting with the best of intentions, they may also have been limiting clients’ choices by failing to explore a full range of options, including effective long-term reversible methods.

Commodity supply systems (including importation laws), pricing issues, the policy environment, and access to trained providers also may curtail the availability of different methods and limit choice (AVSC International, 1999). However, information on these factors is often hard to find. Cleland and Mauldin (1991) noted that cost and distance restrict the range of methods to which poor rural women in Bangladesh have access. Another study (AVSC International, 1998b) peripherally explored lack of method choice in Brazil as part of a larger study of sterilization decision making in Latin America and the Caribbean. Findings suggested that import regulations for IUDs and stringent condom testing requirements limited available family planning methods to two: female sterilization (although use of female sterilization at the time was limited to medical indications) and the pill. In Brazil, oral contraceptives can be purchased at pharmacies without a prescription; however, little or no counseling on side effects or proper use is provided. Not surprisingly, Brazilian sterilization users frequently report method failure and side effects (usually stemming from oral contraceptive use) as reasons for choosing tubal ligation (Vieira & Ford, 1996).

Decision-making process

Many factors identified as being antecedents of sterilization use comprise the elements of sterilization decision-making models. Mumford’s model of vasectomy decision making (1983) is one such model. Within this model, couples proceed through several steps before choosing vasectomy: increased awareness of vasectomy, usually through discussions with other vasectomy users; a decision to have no more children; serious consideration of vasectomy; growing discontent with temporary methods, because of dissatisfaction with or fear of side effects or ineffectiveness; a decision that vasectomy is the best alternative; and a “scare,” usually a missed period, an unintended pregnancy, or contraceptive side effects. The model also suggests that the overall decision-making process takes two years or more.

In general, the overall duration of the decision-making process may vary, and delays may also occur in getting a vasectomy, for such reasons as “fear of pain,” cost, lack of availability, or inconvenience (Mumford, 1983). A “scare” may occur at this time, and represents the ultimate impetus in the decision to choose sterilization. Among vasectomy users in the United States, nearly 34% reported that their last child was mis-

timed or unwanted; about 7% reported having an unplanned pregnancy or a pregnancy scare (Luick et al., 2000).

Some studies have noted deviations from the model proposed by Mumford. Among vasectomy users in Mexico, many obtained information from the mass media (Alarcon et al., 1995); wives appear to have played a more prominent role as a source of information than did other vasectomy users. In addition, no pregnancy scare took place, and the duration of time during which vasectomy was seriously considered (as opposed to the entire decision-making process) was 2–20 months, a period considerably shorter than the Mumford model's two years or more. A shorter duration for this consideration process—of about four months—has also been noted in Brazil, Colombia, and Mexico (Vernon, 1996).

Miller, Shain, & Pasta (1991b) simplified Mumford's model into three steps, applying it to sterilization in general: Couples make the decision to end childbearing; they decide to use sterilization; they then choose between female or male sterilization. They further noted that motivations, attitudes, the nature of the decision-making process itself, and context all affect these processes.

As with the vasectomy model proposed by Mumford, delays may also occur in the decision to choose tubal ligation. Among tubal ligation users in Zaire, delays in the decision-making process occurred because one partner was indecisive. In some cases, these delays resulted in the birth of one or two more children (Bertrand et al., 1991).

Although the decision to choose a permanent method is often presented as a joint decision, some of the literature suggests that the decision to choose sterilization can be an autonomous one. In Nicaragua, Zelaya et al. (1996) compared men's and women's reports of sterilization prevalence and found that women reported greater use of female sterilization than did men; the researchers suggested that some men may be unaware that their partners are using sterilization. In Landry and Ward's six-country study (1997), Bangladeshi, Rwandan, and Sri Lankan vasectomy users often made the decision to choose sterilization on their own, excluding their partners; Rwandan men in the study justified their decisions on the basis of their roles as household heads.

The choice between female and male sterilization

Models that delineate the decision-making process usually include a step related to the decision to choose between male or female sterilization. Couples often decide together which partner will be sterilized, with those choosing vasectomy over female sterilization often stating that they did so because vasectomy is easier, safer, and more effective (Alarcon, 1995; Groat et al., 1985; Luick et al., 2000; Vernon, 1996). In Canada, Alderman's interviews with physicians as clients (1988) found that some respondents chose vasectomy over tubal ligation because of concerns about postprocedural syndromes with female sterilization. In Bangladesh, Kenya, Mexico, Rwanda, Sri Lanka, and the United States, Landry and Ward (1997) also observed that among a few couples, fear of female sterilization was an impetus for choosing vasectomy. Many men also expressed concern over their wives' health and a desire to assume more responsibility in family planning. Providers' recommendations against tubal ligation also were found to be a reason for choosing vasectomy in one U.S. study (Miller et al., 1991b).

Both men's and women's misconceptions about and fear of vasectomy, as well as the convenience of having this procedure immediately after delivery, are a few of the reasons individuals report for choosing tubal ligation instead of vasectomy. In Brazil, women's fears that vasectomy results in sexual impotence led them to choose tubal ligation, even though vasectomy was also available (Vieira & Ford, 1996). In a study of U.S. couples choosing tubal ligation or vasectomy, women whose husbands were fearful of vasectomy and its possible side effects were more likely to choose female sterilization over male sterilization (Miller et al., 1991b). Thirty-nine percent of women who sought tubal ligation in fact did so because their husband refused vasectomy. In other cases, women undergoing tubal ligation stated that female sterilization was a matter of

Couples often decide together which partner will be sterilized, with those choosing vasectomy over female sterilization often stating that they did so because vasectomy is easier, safer, and more effective.

convenience, since it was easier to have the procedure done at the same time as a delivery or a cesarean section.

Outcomes Related to Sterilization

Much of the literature on poststerilization experiences has examined postprocedure effects on sexual and marital relations, satisfaction and dissatisfaction, sterilization regret, and requests for reversal.

Impact on sexual and marital relations

In general, female and male sterilization users reported either no change in their sexual or marital relations or a change for the better, often because sterilization removed much of the anxiety related to the threat of an unintended pregnancy (Bertrand et al., 1989; Bertrand et al., 1991; Ehn & Liljestrand, 1995; Groat et al., 1987; Landry & Ward, 1997; Oddens, 1999; Williams et al., 1990).

Some studies have indicated that sterilization, particularly tubal ligation, might have had a negative impact on a few women's sexual and marital relations. Among sterilized women in Sao Paulo, Brazil, who reported a negative outcome related to sterilization, 19% said that it was more difficult for them to refuse sex with their partners, and 28% stated that their partners had grown more jealous of them (Barbosa & Villela, 1995), probably fearing that the women would become unfaithful. In one study in the former Zaire, 13% of wives who had a tubal ligation reported that their husbands engaged in extramarital affairs to have additional children (Bertrand et al., 1991).

Regret for and satisfaction with sterilization

Comparing and interpreting information on outcomes related to sterilization use is often a difficult task because of the range of terms used to measure these results. Some studies have specifically inquired about regret, asking respondents "Do you have any regret?" or "Do you regret being sterilized?" even though the term "regret" alone might be difficult to define (Loaiza, 1995). In one study in Sao Paulo, Brazil, participants themselves were asked to describe how they define regret. Some defined it as "feelings of sorrow, sadness and loss," sometimes mixed with other feelings, such as "grief over the death of a child or loss of future opportunities in life" (Vieira & Ford, 1996).

Other researchers have attempted to avoid using the term "regret," asking respondents instead whether they ". . . still think tubal sterilization as a permanent method of birth control was a good choice..?" or whether they "are pleased with ___ [the] decision to have had an operation that would keep ___ [them] from having any (more) children?" (Bertrand et al., 1991; Boring, Rochat, & Becerra, 1988; Loaiza, 1995; Wilcox et al., 1991).

"Satisfaction" with sterilization is another concept used to assess outcomes, though for some this term applies to short-term impact, since regret is usually related to more long-term changes, such as remarriage or the death of a child (Landry, 1990). In Loaiza's study of sterilization regret in the Dominican Republic (1995), regret and satisfaction were combined to form one composite indicator.

Besides differing definitions, other factors also contribute to the variability in measuring outcomes related to sterilization. Study samples sometimes exclude sterilized users who have experienced failures, which may lead to lower regret rates (Chi & Jones, 1994). In addition, the length of time following sterilization at which clients are interviewed tends to vary, with periods ranging from a few months to several years after the procedure (Boring et al., 1998). The prevalence of regret varies from country to country, largely as a function of the frequency of divorce and the age and parity at which most sterilizations occur.

On the whole, much of the literature suggests that regret is generally low among

users, though a few high rates were noted. Regret rates across studies ranged from about 7% in Colombia and the United States to about 17% in Bangladesh and the Dominican Republic (Loaiza, 1996; Population Council, 1996; Wilcox et al., 1991; Williams et al., 1990). According to the few existing longitudinal studies, regret rates also varied by the time that had passed since the procedure, though the conclusions regarding the direction of this relationship differed. In one U.S. study, couples relying on tubal ligation or vasectomy reported improved feelings about sterilization after three years, though the sterilization users expressed an increasing desire that their partner had had the sterilization instead (Miller, Shain, & Pasta, 1990). Ehn and Liljestrand's study of vasectomy clients in Sweden (1995) found that regret declined over time, presumably because many problems (pain, soreness, and sexual problems) had disappeared.

In comparison, Hillis et al. (1999) noted that the occurrence of regret increased from seven to 14 years postprocedure, particularly among women who were 30 or younger when sterilized. A few researchers also found that feelings surrounding sterilization can be transitory, with sterilization users expressing regret at least once over the course of multiple interviews (Ehn & Liljestrand, 1995; Miller et al., 1990; Wilcox et al., 1991). Warren et al.'s 1988 cross-national study of regret (in Panama, Puerto Rico, and the United States) found a direct relationship between regret or desire for reversal and time elapsed since the procedure.

Studies examining satisfaction among sterilization users suggest that users are largely satisfied with their decision to choose sterilization (Barbosa & Villela, 1995; Bertrand et al., 1989; Diadhiou et al., 1994; Landry, 1990; Loaiza, 1995; New ERA, 1996; Oddens, 1999; Vieira & Ford, 1996). Most female sterilization users interviewed in Senegal reported that they were satisfied with the method, explaining that they felt "peaceful" and "rested" because their risk of pregnancy had greatly diminished (Diadhiou et al., 1994). One comparative study of all contraceptive users in West Germany found that method dissatisfaction was lower among sterilization users (4%) than among those who had ever used oral contraceptives (14%), condoms (42%), IUDs (34%), and natural family planning (33%) (Oddens, 1999). In general, satisfaction rates among female respondents across studies ranged from 76% in Sao Paulo, Brazil, to 98% in Senegal (Diadhiou et al., 1994; Vieira & Ford, 1996). Vernon's study of vasectomy clients in Brazil, Colombia, and Mexico (1996) found that almost all men reported being satisfied with the procedure.

Among both men and women, one of the most common reasons for regret is the desire for more children, usually as the result of the death of a child or remarriage. Chi and Jones (1994) found loss of a child to be an important factor for regret in developing countries. In Colombia, the Democratic Republic of Congo (formerly Zaire), the Dominican Republic, Nepal, Puerto Rico, and Sweden, the most common reasons for regret were related to the desire for more children (including as the result of the death of a child) or regret about the inability to have any more children (Bertrand et al., 1991; Boring et al., 1988; Loaiza, 1995; Platz-Christensen et al., 1992; Thapa & Friedman, 1998; Williams et al., 1990). In Brazil, the majority of women reporting regret did so because they wanted to have a child of a particular sex, usually a girl (Vieira & Ford, 1996). A study in Puerto Rico found similar results, with women who had sons and no daughters more likely to express regret than women with daughters but no sons (Boring et al., 1988). Researchers in the Puerto Rican study noted that these results contradict Philliber and Philliber's findings associating regret with a lack of sons, suggesting that these differences may be due to the fact that much of the research reviewed in 1985 focused on Africa and Asia. However, one study in Asia found similar results: Bangladeshi women with daughters and sons were less likely to express regret than were those with children of one sex, reflecting a preference for a "balance" of sexes in children (Population Council, 1996).

Other reasons cited for regret include change in marital status, perceived side effects and health changes, and contraceptive failure (Bertrand et al., 1991; Boring et al., 1988; Chi & Jones, 1994; Chi & Thapa, 1993; Loaiza, 1995; Miller et al., 1990; Miller,

Among both men and women, one of the most common reasons for regret is the desire for more children, usually as the result of the death of a child or remarriage.

Shain, & Pasta, 1991a; Thapa & Friedman, 1998; Vieira & Ford, 1996). Religious misgivings were also cited, but less frequently (Bertrand et al., 1991; Boring et al., 1998; Chi & Jones, 1994; Loaiza, 1995; Thapa & Friedman, 1998; Vieira & Ford, 1996; Williams et al., 1990). Regret from the loss of fertility or perceived loss of interest in sexual relations following surgery has also been noted (Vieira & Ford, 1996). Zairian women in Bertrand et al.'s study (1991) indicated an association between those women expressing regret and those reporting that their husbands had tried to have children with other women.

Much of the literature also tends to agree on a number of key risk factors. In their review, Chi and Thapa (1994) noted that risk factors for sterilization regret can generally be divided into three categories: client characteristics at the time of sterilization (e.g., young age at sterilization and marital instability), circumstances at the time of sterilization (e.g., stress of difficult labor, abortion, or cesarean section, and someone else making the decision), and changes in clients' characteristics or circumstances after the procedure (e.g. remarriage, death of a child, or change in the desire for more children). Table 5.5 (page 128) describes risk factors for sterilization that were identified in the studies reviewed. Overall, young age at sterilization and changes in marital situation were the two most commonly noted predictors of sterilization regret.

Miller et al. (1991a) found that feelings of regret are not limited to the individual obtaining the procedure. Observing regret among husbands of tubal ligation users and among wives of vasectomy users, they noted that poor couple communication, perceived regret in the other individual, and dominance by one spouse in the decision are risk factors for regret among spouses of users of tubal ligation and vasectomy. Few other studies to date have examined regret for sterilization from the perspective of the non-sterilized partner.

Request for reversal

An estimated 2–6% of sterilized men and women in developed countries and 0.2% in developing countries seek information about sterilization reversal (Marcil-Gratton et al., 1988; Potts et al., 1999). In developing countries, the percentage of women potentially interested in the return of fertility is probably underestimated, given the inaccessibility of reversal services and the corresponding lack of knowledge about reversal. The authors of one study conducted in Brazil argued that because of the “objectivity” of the number of individuals who request sterilization reversal, estimates of regret should be based on this number (Hardy et al., 1996). However, in another Brazilian study, the researchers noted that doing so would largely underestimate the level of regret (Petta et al., 1995), since not all of those who regret the procedure will initiate consultations about reversal.

In many ways, the parallels between request for reversal and regret are indeed quite close. In their review of literature on sterilization regret for tubal ligation, Chi and Jones (1994) found similarities between factors related to regret and those related to requests for reversal. A younger age at sterilization, a change in marital status, influence or pressure from others (e.g., a spouse or partner), and sterilization for medical purposes were all associated with requests for reversal, as well as with the risk of regret. In one U.S. study, Schmidt et al. (2000) identified a 14-year cumulative probability of requesting reversal of 14% among female sterilization users, with the cumulative probability increasing to 40% among women who were aged 18–24 when they were sterilized.

Potts et al. (1999) drew similar conclusions from their study of male sterilization users, with increased vasectomy reversal among men sterilized when they were younger than 30. Reasons for requesting sterilization reversal largely mirrored those stated as reasons for regret: divorce and remarriage, the death of a spouse, the death of a child, a change of mind about family size, and (in the case of vasectomy) a desire to regain masculinity. Moreover, the risk of regretting a vasectomy was highest when the procedure was performed during an emotional crisis. These findings are echoed in a smaller study

conducted in England of tubal ligation and vasectomy clients: Participants stated they wanted a reversal because they had changed partners or wanted to increase family size (Rowlands & Feasey, 1992).

Addressing Gaps in Sterilization Research

Besides providing a comprehensive overview of sterilization decision making and the consequences of those decisions, Philliber and Philliber (1988) also offered a critical analysis of the research literature, highlighting gaps and needs for future research. They concluded that

research on antecedents to voluntary sterilization has been more successful in demonstrating what is not important than what is. At this point, there is little reason to believe that the decision to have a voluntary sterilization is affected very much by socioeconomic status, culture, attitudes, or stages in the life cycle. [However,] researchers and practitioners alike continue to believe that these factors are what matter in the decision to be sterilized. They have failed, therefore, to pursue efforts in other directions. It is time to look at new variables.

To fill this gap, Philliber and Philliber called for research to examine the role of user characteristics, influences in decision-making, and outcomes related to the decision to choose sterilization. Rather than descriptive and retrospective studies, the body of literature on decision making should also include longitudinal studies that follow users through part of the decision-making process and then at different points after the procedure. To provide a more complete picture of the decision to choose sterilization, studies could also look at couples who do not choose sterilization or those who postpone the decision to use sterilization.

In general, much of today's research is predominantly descriptive and retrospective. A better understanding of why women and men opt for sterilization over other methods is still needed. Nevertheless, a few longitudinal and case-control studies have been carried out over the past 15 years. Groat, Neal, and Wicks (1987) interviewed married couples in one U.S. city within the first five years of their marriage and then 10 years later. Communication between couples and joint commitment to family planning were predictive factors affecting the decision to choose sterilization, as well as the method of sterilization chosen.

Another of these studies, conducted by Miller et al. (1990) in the United States, compared factors affecting decision making among non-Hispanic white couples choosing vasectomy and among similar couples choosing tubal ligation, and looked at outcomes as well. In this study, most significant predictors of sterilization decision making were related to communication and to the decision-making dynamics of the couple, such as motivation to end childbearing and conflict and dominance during decision making. Through interviews with the same population three years later, the researchers observed that predictors for regret (in this case, regret among both the sterilized and the nonsterilized partner) were also aspects of couple dynamics.

The U.S. Collaborative Review of Sterilization (CREST), reported in Wilcox et al. (1991) and later in Hillis et al. (1999), is another longitudinal study on regret that looked at women before they underwent sterilization and then contacted them annually for 14 years after the procedure, to identify presterilization characteristics associated with regret. Young age at sterilization was found to be the strongest predictor of regret.

In the United States, in a prospective, longitudinal study of 1,200 poor women who were planning sterilization, Davidson et al. (1990) looked at reasons for failing to obtain a sterilization. Among women who had planned sterilization, 41% did not obtain the procedure. Reasons for not having done so were analyzed separately for women planning postpartum procedures and those planning interval procedures. Among postpartum women, the most common reason for not obtaining a sterilization included bureaucratic and institutional barriers, such as a lack of available staff or space, a loss of records, or payment problems (32%), followed by influence from others, including partners or

Table 5.5. Commonly cited presterilization and poststerilization risk factors for regret, by country

Country	Sex	Risk factor	Category*			Source
			Circumstances surrounding decision	Client characteristics at time of sterilization	Change of characteristics after sterilization	
Australia	M	Divorce and/or remarriage/new partner	X	Jequier, 1998
		Desire for more children	...	...	X
Bangladesh	M, F	<i>Sterilized individual and nonsterilized partner</i>				Population Council, 1996
		Young age at sterilization	...	X	...	
		Regret at being unable to bear another child	...	...	X
		Decision made by someone else	X	...	...
		Did not want sterilization (wanted other method)	X	...	...
		Too many children of one sex	...	X	...	
Bangladesh	F	Decision made by husband	X	Schuler et al., 1996
		Partner opposed to sterilization	X	...	...
Brazil	F	Young age (<25)	...	X	...	Hardy et al., 1996
		Less information about the procedure	...	X	...	
		Fewer contraceptive methods known	...	X	...	
Brazil	F	Young age (<30)	...	X	...	Vieira & Ford, 1996
		Divorce and/or remarriage/new partner	...	...	X
		Pressure to have sterilization	X	...	...
		More years of education	...	X	...	
		Did not pay for sterilization	...	X	...	
		Previous contraceptive failure	...	X	...	
Canada	M	Divorce and/or remarriage/new partner	X	Alderman, 1991
Colombia	F	Widowed and/or remarried/new partner	X	Williams, Ojeda, & Trias, 1990
Denmark	M, F	Desire for more children	X	Kjersgaard et al., 1989
Dominican Republic	F	Young age (<30)	...	X	...	Loaiza, 1995
		Divorce and/or remarriage/new partner	...	...	X
		Low parity (≤ 3 children)	...	X	...	
		Death of a child	...	...	X
		Sterilization was first contraceptive	...	X	...	
Nepal	F	Death of a child	X	Thapa & Friedman, 1998
Puerto Rico	F	Young age (<25)	...	X	...	Boring, Rochat, & Becerra, 1988
		Divorce and/or remarriage/new partner	...	...	X
		Decision made by someone else	X	...	...
		Death of a child	...	...	X
		Sterilized for medical reasons	X	...	...
		Absence of a daughter	...	X	...	
Sri Lanka	F	Young age (<25)	...	X	...	Hapugalle et al., 1989
		Decision made by someone else	X	...	...
		Death of a child	...	...	X
		Low parity (≤ 2 children)	...	X	...	
		Absence of a child of each sex	...	X	...	
		Partner opposition to sterilization	X	...	...
		Married <5 years	...	X	...	

(cont'd.)

Table 5.5. Commonly cited presterilization and poststerilization risk factors for regret, by country (*cont'd.*)

Country	Sex	Risk factor	Category*			Source
			Circumstances surrounding decision	Client characteristics at time of sterilization	Change of characteristics after sterilization	
Sweden	F	Young age (<30)	...	X	...	Platz-Christensen et al., 1992
		Desire for a child with a new partner	...	...	X
Sweden	M	Divorce and/or remarriage/new partner	X	Ehn & Liljestrand, 1995
		Lack of information on alternatives	...	X	...	
		Desire for more children	...	...	X
Thailand	F	Death of a child	X	Pitaktepsombati & Janowitz, 1991
		Low parity (fewer than preferred)	...	X	...	
		Concurrent cesarean section	X	...	...
		Sterilization for medical reasons	X	...	...
United States	F	Young age	...	X	...	Henshaw & Singh, 1986
United States	F	Young age (<30)	...	X	...	Wilcox et al., 1991
		Concurrent cesarean section	X	...	...
		History of abortion	...	X	...	
		Use of public funds for sterilization	...	X	...	
United States	F	Young age (<30)	...	X	...	Hillis et al., 1999
		Divorce and/or remarriage/new partner	...	...	X
		Decision without adequate consideration	X	...	...
		Death of a child	...	...	X
United States	F	Young age (<25)	...	X	...	Miller, Shain, & Pasta, 1991a
		Ambivalence about future childbearing	...	X	...	
		Negative attitudes toward sterilization	...	X	...	
		Partner dominated decision making	X	...	...
		Partner conflict during decision making	X	X	...	
United States	M, F	<i>Sterilized partner</i>				Miller, Shain, & Pasta, 1991b
		Unresolved motivation for more children	...	X	...	
		Desire for more children	...	...	X
		<i>Nonsterilized partner</i>				
		Partner conflict	X	...	...
		Poor couple communication	X	...	...
		Dominance by partner in decision making	X	...	...
Perceived regret of partner	...	...	X		
United States	F	Young age (<30)	...	X	...	Grubb et al., 1985
		Concurrent cesarean section	X	...	...
Zaire†	F	Low parity (≤5 children)	...	X	...	Bertrand et al., 1991
		Pressure to have sterilization	X	...	...
		Sterilization for medical reasons	X	...	...
		Behavior change of partner	...	...	X

* Major risk factors can be divided into three categories: those related to clients' characteristics at the time of sterilization, to the circumstances under which the sterilization is performed, and to changes in clients' characteristics after sterilization (Chi & Thapa, 1993).

† Now the Democratic Republic of Congo.

Future research should continue to probe into the attitudes of providers and should make use of data collection methods besides interviews (e.g., observations) to strengthen the quality of the data.

providers (26%), and fear of the procedure (17%). Women who had been planning interval procedures named influence or pressure from others, institutional and bureaucratic barriers, and fear of the procedure as reasons for the change in their plans. The authors noted that while 6% of those who obtained a sterilization later regretted the decision, 47% of those who did not obtain one experienced regret.

Janowitz et al. (1985) also examined unfulfilled plans for sterilization. Among women from two urban cities in Honduras who had been considering sterilization, the most commonly cited reasons for not obtaining one included spousal opposition, economic barriers (e.g., no money for the procedure), and time and family restrictions (e.g., a lack of time, inability to leave the family, or poor family health). In some cases, women did not undergo the procedure because they decided they wanted more children or they had separated from their partner and felt that there was no need to do so.

Providers' attitudes toward sterilization is an area that requires further research (AVSC International, 1998b), with much of what we know based on information collected from client interviews. However, in a few cases, other means of data collection, such as interviews with providers, have been conducted (Bailey et al., 1991; Centre for Operations Research and Training, 2000; Harrison & Cooke, 1988; Landry et al., 1992).

Future research should continue to probe into the attitudes of providers and should make use of data collection methods besides interviews (e.g., observations) to strengthen the quality of the data. As Bailey et al. (1991) found, provider interviews do not necessarily depict provider practices accurately: Most providers interviewed in Sao Paulo, Brazil, used sterilization themselves (including vasectomy) and would recommend both methods to clients. Most physicians' positive attitudes toward vasectomy failed to match the situation regarding sterilization in Brazil, where tubal ligation rather than vasectomy is the norm. Analysis of both qualitative and quantitative data from various sources would provide a clearer picture of whether providers do indeed recommend vasectomy to their clients.

Additional Needs in Sterilization Research

There is a clear continued need for a better understanding of why men and women choose sterilization rather than other methods, as well as for more longitudinal research on sterilization and for more studies on provider attitudes. However, the literature indicates that other gaps exist. For example, in recent years, the international dialogue on reproductive health has focused on the need for more comprehensive services. Researchers, program developers, and advocates have stressed that reproductive health services should be more integrated into the health sector, so that providers and clients alike use their interactions to explore more fully and attend to needs other than those that brought the client to seek services. Some women and men who use sterilization may see no need for reproductive health care once they have obtained the method and end their fertility (Cates & Stone, 1992).

The need to broaden reproductive health services is embedded in much of the existing sterilization literature. Chapter 1 describes some of the research that has examined the reproductive health needs of sterilization clients, and identifies challenges in providing continuity of care to sterilization clients who perceive minimal need for additional reproductive health services once their fertility ends.

Interactions with the health care system, such as at the time of the sterilization procedure, provide excellent opportunities to educate, screen, and treat clients. Screening for cervical cancer, for example, could be tied in with sterilization services. One study of 642 U.S. women who had cervical carcinoma found that increases in screening would have the "greatest potential effect in reducing the incidence rate of invasive cervical carcinoma" (Sung et al., 2000). The authors recommend encouraging screening among women of childbearing age, particularly when they receive antenatal or postpartum care. By extension, sterilization services could provide another opportunity, given that the same population of women of childbearing age is receiving care.

Another area meriting attention is that of sexually transmitted infections (STIs). Like many other family planning methods, sterilization fails to offer any protection against STIs, including HIV and AIDS. Landry and Ward's study (1997) among vasectomy users in Kenya, Mexico, and Rwanda found that although some men described protection against pregnancy with more than one partner as a benefit of vasectomy, none noted that having more than one partner would put them or their partners at increased risk for transmitting STIs. Among female sterilization users in Sao Paulo, Brazil, half believed that their partners were unfaithful to them, but refused to address the problem with their partners (Barbosa & Villela, 1995). Despite the extent to which these women had contact with men who were at risk for HIV and AIDS, few liked condoms, and none had used them during the month prior to the interviews. Nearly half of the sterilization users reported symptoms characteristic of an infection.

Additional research is necessary to learn about the reproductive health needs of sterilized men and women, such as cervical cancer and STIs, and then to identify the most effective ways to address them.

Informed choice and consent is another area warranting attention. Over the past 15 years, a number of allegations regarding informed consent abuses have emerged. In the future, researchers need to continue monitoring incentives, disincentives, targets, quotas, and allegations of coercion, while also exploring more subtle barriers to choice: lack of information and knowledge, provider adherence to medical models, power dynamics within relationships, and a lack of available method choice, among others. Few studies have examined the issue of choice as a whole, such that it is difficult to form an overall picture. Attention often is focused on client-provider interactions, while more personal, familial, or social issues that also bar choice are overlooked. In addition, research should also consider the factors that keep women from obtaining the sterilization services they desire, as these, too, compromise full and voluntary choice (Benagiano & Cottingham, 1997). A study among women in New York City reveals that many women who failed to obtain the sterilization they wanted also faced barriers to choice (Davidson et al., 1990).

Lastly, as demonstrated in Chapter 2, the high prevalence of sterilization is a worldwide phenomenon, yet research still tends to focus on a preconceived notion of who sterilization users are. Bumpass et al. (2000) observe that one-third of all women using sterilization in the United States are unmarried. In addition, many of these women are black. Longitudinal studies such as those of Miller, Pasta, and Shain (1990 and 1991a) on the predictors of sterilization and sterilization regret need to be extended so that samples go beyond non-Hispanic white married couples in the United States.

In addition, few studies outside of the United States have examined sterilization use beyond the developing country context. In their study of sterilization use in Scotland, Hunt and Annandale (1990) highlight this gap, stating that "recent studies of social, behavioral, and attitudinal correlates of contraceptive method use have largely been limited to studies in developing countries." Australia, Canada, the Republic of Korea, New Zealand, the United Kingdom, and the United States are but some of the developed countries in which female and even male sterilization are two of the most widely used methods. Future research should examine sterilization use in these countries as well, thereby broadening and creating a fuller understanding of the antecedents and outcomes of sterilization use.

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