

Organizing a Public-sector Vasectomy Program in Brazil

Luis Guilherme Penteado, Francisco Cabral, Margarita Díaz,
Juan Díaz, Laura Ghiron, and Ruth Simmons

Although models of high-quality family planning services for men exist in Latin America, few if any have been organized within the complex and resource-constrained national public health systems. This study provides evidence from the Santa Barbara project in southern Brazil showing how vasectomy was introduced into the municipal health system. It demonstrates that once the necessary operational and quality-of-care improvements were in place, and sufficient political and technical support existed to proceed, it was possible to establish low-cost, well-used, and sustainable vasectomy services free of charge. The findings show that careful attention to the development of strong technical competence and an informed choice process resulted in high user satisfaction. Focus-group discussions with men who underwent vasectomy indicate that they had no objection to being served in the context of a women's health center and that they act as opinion leaders who draw an increasing clientele to the service. (STUDIES IN FAMILY PLANNING 2001; 32[4]: 315–328)

Vasectomy is a simple, safe, and cost-effective method of fertility regulation for men that, despite improvement in its clinical technique, lags far behind the prevalence rates for female sterilization in the world (Johnson and Macke 1996). In only three countries for which recent information is available does the prevalence of male sterilization equal or exceed that of female sterilization (Netherlands, New Zealand, and the United Kingdom). In Belgium, Canada, and the United States, the ratio is less than one to two. Elsewhere, the ratio of male-to-

female sterilization ranges from one to three in China and Japan to an incalculable ratio in parts of Africa where vasectomy remains virtually unknown (UN 1998). The ratio in Brazil is 1:15 (BEMFAM and DHS 1997).

In 1983, participants at the First International Conference on Vasectomy, held in Sri Lanka, concluded that the principal reason for the low prevalence of male sterilization was not men's resistance to the method but rather the failure to make information and services available and accessible (Atkins and Jezowski 1983). Almost two decades later the same arguments are being made. For example, a review of operations research on vasectomy in Latin America commented "the procedure's low prevalence results more from an inadequate supply of services than from a lack of demand" (Vernon 1996). Participants at an international workshop on the role of men in family planning held in Kenya in 1997 concluded that policymakers, program managers, and providers can "block male involvement" as a result of their conservative values, biases, or politics (Wegner et al. 1998). These arguments suggest that much remains to be learned about how to organize appropriate services so that widespread use of vasectomy is facilitated.

Luis Guilherme Penteado is Medical Doctor, Secretariat of Health, Santa Barbara d'Oeste, SP, Brazil. Francisco Cabral is Vice President and Margarita Díaz is President, Reprolatina, Campinas, SP, Brazil. Juan Díaz is Senior Program Associate, The Population Council, Brazil, Campinas, SP, Brazil. Laura Ghiron is Research Associate, and Ruth Simmons is Professor, Department of Health Behavior and Health Education, University of Michigan School of Public Health, 1420 Washington Heights, Ann Arbor, MI, 48109-2029. E-mail: rsimmons@umich.edu.

Three well-publicized programs in Latin America confirm that when services of high quality are made available to men, the response is positive: Profamilia in Colombia, Pro-Pater in Brazil, and the Instituto Mexicano del Seguro Social program in Mexico (Foreit et al. 1989; Vernon et al. 1991; de Castro and de Castro 1995; Jezowski et al. 1995; Vernon 1996; AVSC 1997).¹ These programs provide a model from which others can learn, but because they are organized within special settings,² they provide only limited guidance to those interested in incorporating services for men into routine public-sector services in Latin America. This study provides evidence from the Santa Barbara project in southern Brazil (Díaz et al. 1999), showing how vasectomy has been incorporated successfully into the primary health-care system at the municipal level. The introduction of vasectomy into this setting was part of a larger program-improvement effort designed to enhance access, broaden reproductive choice, and improve quality of care.

Background

In Brazil, as in many other countries, women carry the burden of contraceptive use. In 1996, the contraceptive prevalence rate among women who are married or living in union was 77 percent,³ most of which was accounted for by female sterilization (40 percent) and oral contraception (21 percent). In contrast, nearly 3 percent of Brazilian women married or living in union reported that their husbands or partners had had a vasectomy, and 4 percent reported condom use (BEMFAM and DHS 1997).

Public-sector services, delivered through municipal health posts and health centers, are an important source of reproductive health care for the Brazilian population. Contraceptive services are a component of the national Women's Health Program, and family planning is considered a part of gynecological care. Services are free of charge. In practice, however, services are frequently difficult to obtain, quality of care is poor, and providers' focus is on women, especially pregnant ones (Formiga et al. 1994). Few public-sector institutions provide family planning services for men. Condoms are provided primarily to women or are purchased by men or women at pharmacies.

Male and female sterilization were not included in the Ministry of Health family planning norms until August 1997 when sterilization was legalized. Female sterilization had already been widespread, in part because it could be linked to the performance of cesarean section (Faúndes and Cecatti 1993). Vasectomy became more

widely available in the private sector in the years preceding legalization,⁴ but access to vasectomy in the public sector remains limited. Prior to legalization, several hospitals offered vasectomy as a routine service. Most health posts and centers were not aware that they did, however, and the mechanisms to refer men to these services were not in place (Formiga et al. 1994). Since 1997, men have had the right to obtain vasectomy services; doing so entails complex bureaucratic procedures through secondary hospitals, however, and at the primary level, services remain unavailable.

An assessment of the need for contraceptive introduction undertaken in 1993 with support from the World Health Organization (Formiga et al. 1994) concluded that implementation of family planning services in Brazil was generally weak, and that there was "a critical need for public sector family planning services which can provide women with a broader range of contraceptive options, and that encourage greater use of male methods" (Formiga et al. 1994). The assessment recommended that demonstration projects be organized in municipal service settings that would test approaches to broadening reproductive choice.

With this purpose in mind, in 1994 the municipality of Santa Barbara d'Oeste and the Center for Research on Maternal and Child Health (CEMICAMP)⁵ began a collaborative action-research project called the Santa Barbara project. This project attempted to improve quality of care, reproductive choice, and client access to public health services (Díaz et al. 1999).⁶ Santa Barbara d'Oeste is almost exclusively an urban community with a predominantly lower-middle- and working-class population of 170,000, 88 percent of whom live within walking distance of a health facility. The municipality has one hospital that is not part of the municipal health system. Public-sector health services are concentrated in 11 health posts and centers. Vasectomy and tubal ligation were available from private providers only and were expensive.⁷

Data collected during a baseline diagnosis for the Santa Barbara project showed that local men and women were critical of the limited availability and accessibility of municipal health services, especially in the area of family planning and related areas of reproductive health (Díaz et al. 1999). They also criticized the absence of surgical contraceptive options. Many of the men interviewed believed that responsibility for contraception should be shared by men and women and that decisionmaking should involve both partners in a couple with the assistance of health providers. Most were aware of the existence of a male surgical sterilization procedure, and several knew of vasectomy's distinct health advantages over female sterilization.

Introducing Vasectomy Services for Men

Although the Santa Barbara project's initial emphasis was on women's reproductive health needs, results from the diagnostic assessment showed that men's contraceptive needs had to be addressed as well. The project's executive committee—a participatory decisionmaking body consisting of health authorities, community women, project researchers, and providers⁸—decided, therefore, to address men's needs first by opening up services more generally to men and then organizing a vasectomy program. The plan was accomplished by inviting women to bring their partners to consultations in order to facilitate joint contraceptive decisionmaking; by encouraging men to participate in educational sessions about contraceptive methods and sexually transmitted diseases; and by distributing condoms to men at municipal health facilities. Such broadening was relatively easy to implement, requiring minimal intervention beyond informing the staff and clients of their availability. Organizing vasectomy services, on the other hand, was a major innovation.

The key objective of the vasectomy project was to develop a model that guarantees a high level of informed choice and quality of care and at the same time ensures that it can be implemented and replicated within the constrained resources of the municipal health sector.

Minimizing Political Risk

The decision to implement vasectomy services was supported by the Secretary of Health of Santa Barbara, but he drew attention to the political risks involved. Because the legal status of male and female sterilization in Brazil was still ambiguous, he was concerned about potential opposition from the local church. Such opposition to family planning services is common in Brazil, where the Catholic Church played a major role in delaying the legalization of sterilization. Moreover, because the plan to implement vasectomy involved training a gynecologist at the referral center in the no-scalpel technique and providing the service free of charge (a national policy requirement), the Secretary of Health anticipated that some local urologists might feel threatened. Vasectomy provision normally falls under their purview and is viewed as an important source of revenue. Impending elections also added to the political liabilities of organizing vasectomy services.

To minimize the political risks involved, the decision was made that vasectomy would be offered as an extension of the existing reproductive health program and not as an independent service. No explicit advertising of the availability of vasectomy services would

take place and no special effort would be made to attract a large clientele. Instead, vasectomy could be discussed only with men and women who attended the referral center for family planning services. Before the project was fully under way, however, an interview with Santa Barbara's health secretary during which he mentioned the vasectomy project was broadcast by a local radio station. That week, more than a hundred men visited the referral center inquiring about the new service. Beyond this initial announcement, no further information about the availability of vasectomy services was provided publicly.

The mayor, under whose auspices the program was started, was not re-elected. When a new mayor and health secretary were installed, the project coordinators had to negotiate the continuation of the project with the new authorities.

Working with Limited Additional Resources

As part of the broader changes undertaken by the Santa Barbara project, the municipal health system had been reoriented to provide more client-centered reproductive services and to increase access and availability. These larger improvements created the preconditions for the easy and cost-effective introduction of vasectomy.

The creation of a model reproductive health referral center in one of the two existing health centers was of key importance. Because vasectomy services could be accommodated within this referral center, no additional resources for space were needed. A room equipped with an examination table where surgery and follow-up could be conducted was available during vasectomy clinic sessions. The schedule of clinic sessions was reorganized to allow first one and later two three-hour blocks for seeing vasectomy clients.

The personnel required to deliver vasectomy services include the staff gynecologist, an auxiliary nurse, a psychologist, and a receptionist. Because the Santa Barbara project had been able to mobilize municipal resources to recruit a gynecologist and two psychologists for the referral center, additional personnel were not needed.⁹ Once the vasectomy service functioned at full capacity, it required 20 percent of the efforts of the gynecologist, the psychologist, the auxiliary nurse, and the receptionist.

The need for additional equipment and supplies was minimal, and these were inexpensive to obtain. For example, the first vasectomy surgical kit¹⁰ was donated by the gynecologist trained to perform the procedure. When the success of the project had been demonstrated, the municipality purchased two kits and then later two

more, at a cost of US\$80 each. Sterilization equipment for surgical supplies was already in use at the referral center, and its use was easily extended to sterilization of the new kits' contents. Purchasing sterile surgical clothing for providers was not costly. With support from the health secretary and the mayor, the resources for additional supplies and equipment were identified from existing budgets.

Resource requirements were also kept to a minimum by referring men who needed to obtain sperm counts to test for azoospermia to another facility within the municipality, rather than duplicating this capacity within the referral center. Such tests constitute a preapproved service reimbursable by the Sistema Unica de Saúde (SUS), the federal agency responsible for reimbursing public-sector facilities for health services provided.

Capitalizing on Earlier Quality-of-care Training

A five-day general training for staff of municipal health centers and posts was conducted by the CEMICAMP team in 1995 as one of the major initial interventions of the Santa Barbara project. Using role-playing, case-study discussions, group activities, games, and practical, hands-on training, this program covered four broad areas: (1) the philosophy of reproductive health, with a focus on women's needs; (2) the characteristics of a high-quality family planning service-delivery system, including job descriptions, definition of functions, scheduling, and patient flow; (3) counseling and communications skills; and (4) an update on all contraceptive methods, including vasectomy. This program was followed by a one-day workshop for the staff of health posts and centers covering sexuality, gender issues, sexually transmitted diseases, and HIV/AIDS.

In 1996, additional training was organized to prepare the team of vasectomy providers to initiate the new service. Training in gender-sensitive counseling for the psychologist and surgical training for the gynecologist were held at the Reproductive Health Clinic of the State University of Campinas (RHC-UNICAMP). The training had both theoretical and practical components. The gynecologist's training required that he reach a certain level of skill, not merely be able to perform a predetermined number of procedures. First, he observed eight vasectomies and then performed 24 procedures under the observation of physician-trainers. He was certified to provide vasectomies after he had achieved the required proficiency. In addition, he was trained in the psychosocial dimensions of providing the procedure, because he would share responsibility for confirming that men were adequately prepared to undergo vasectomy.

In addition, the psychologist and gynecologist visited a Profamilia clinic in Colombia to observe vasectomy service delivery. Upon completion of their training, the gynecologist and the psychologist trained the nurse, the auxiliary nurse, and the receptionist in counseling and in the procedure for managing vasectomy requests. The 1995 general training of all staff, during which all contraceptive methods, including both sterilization procedures, had been discussed, provided the staff who delivered educational sessions with all the tools necessary to address the informational needs of vasectomy clients.

All referral center personnel, including those who would not participate directly in delivering vasectomy services, were informed of the characteristics of the program. After these and other necessary operational steps described below were taken, the service opened in June 1996.

Ensuring an Informed-choice Process

After the training was complete, vasectomy providers, the Santa Barbara project coordinator, and the CEMICAMP team established a service protocol and minimum eligibility criteria based on those developed by the RHC-UNICAMP. This protocol was approved by the Santa Barbara project executive committee. Its intent is to ensure that couples participating in the program arrive at a free and informed decision, are aware of other options, and are unlikely to suffer from sterilization regret, a serious and growing phenomenon among sterilized women in Brazil (Hardy et al. 1996; Vieira and Ford 1996). The major steps of the service protocol are described below.

Meeting the Eligibility Requirements

To minimize the likelihood of sterilization regret and in order to exercise appropriate caution because sterilization was not yet legal, relatively stringent eligibility criteria were established. To receive a vasectomy, a man had to be at least 30 years old, have lived with his current partner for a minimum of five years, and have two or more living children of his own with the youngest being one year old or older. At least one of the children had to live with the man and his current partner. Couples had to present documentation verifying compliance with these prerequisites.

The legalization of sterilization in 1997 was accompanied by national guidelines for eligibility criteria that, for the most part, were less restrictive than those developed by the project. According to the national law, surgical sterilization may be obtained by women and men aged 25 or older or by those who have at least two living chil-

dren. The surgery must be performed at least 60 days after the procedure is requested. During the waiting period, the service must provide an alternative contraceptive method. For cases in which pregnancy is life threatening or the woman's health condition implies a high risk for the newborn, surgery can be allowed without meeting the described requirements. Tubal ligation is not allowed either during cesarean section or within the first 60 days after delivery. Legally married women or men need spousal written consent to undergo the procedure.

The Santa Barbara vasectomy program added the waiting period but decided to retain its stricter criteria until March 1999 when the research period was officially over. Since then, national guidelines are being followed.

Educational Activities

Men can come alone or with their partners to attend an educational session during which all the contraceptive options, including vasectomy, are discussed. Those who attend this session are exposed, many for the first time, to the array of contraceptive methods available through the referral center.

A second educational session, devoted exclusively to a discussion of tubal ligation and vasectomy, is conducted with all couples interested in vasectomy.¹¹ Although tubal ligation is not offered by the referral center, educating couples about both procedures was considered important. The main focus of this second session was on the permanence of sterilization and the factors that can lead to postsurgical regret. The two-step educational process helps couples make informed decisions about undertaking the surgery. In the past, few if any methods were available and educational services were minimal.

Psychological Screening Interview and Approval

Subsequent to the second educational session, couples participate in screening interviews with either the psychologist, nurse, or gynecologist about their motivation for wanting a vasectomy and their expectations for the procedure and recovery.¹² Demographic data and information about the couple's relationship, their reproductive and sexual health, and their prior contraceptive use are collected at this time. Interviews are conducted with each partner individually and thereafter with both together. Upon completion of the interviews, couples sign an informed-consent form stating that they are aware that the procedure is permanent, that they have been informed of other options, and that they are undergoing the procedure by choice. They receive an educational booklet describing both surgical sterilizations and comprehensive information about vasectomy, including preoperative preparation and postsurgical care.

Once a couple completes this process, their file is reviewed by a three-person committee of vasectomy service providers that approves or denies the request according to whether all criteria have been met. Then the surgery is scheduled.

Surgery and Follow-up

No-scalpel vasectomy is performed by the gynecologist, assisted by an auxiliary nurse, usually in 10 to 15 minutes, on an outpatient basis with local anesthesia. Just before the procedure, the gynecologist reconfirms that the man understands the permanence of the method and that he is completely secure in his decision.

Men are asked to return for a postoperative follow-up visit to check for complications. Originally, men were asked to obtain a free sperm count one to two months (or 16 ejaculations) after the surgery to verify the absence of sperm in the semen. This time frame was later increased to two to three months (25–30 ejaculations) in keeping with international findings indicating that the time to reach zero count is longer than initially thought (Benger et al. 1995; Smith et al. 1998; Sivardeen and Budhoo 2001).¹³ If sperm are still present, the man is asked to return for a second count after 30 days. If sperm are found in the second sample, he can choose to undergo a second procedure.

Men are instructed to continue using their contraceptive method until the absence of sperm has been verified. Condom use is recommended when couples were not using any method at the time of the surgery, and condoms are provided to them.¹⁴

Results

When vasectomy services were first offered in June 1996, the referral center's capacity was two surgeries per week. The number of vasectomy requests accumulated quickly during the early months, especially after the health secretary's radio interview. The demand for the surgery became greater than what the center could provide, because surgical supplies were limited, as was staff time. For several months, there was a waiting list numbering more than 100 men who had been approved by the project and who were in line to undergo the procedure. Concurrently, more couples were informed of the availability of vasectomy and opted to make use of it as well, so that the waiting time for the service increased.

To respond to this unexpectedly high demand, the service capacity of the referral center was increased early in 1997. Two additional surgical kits were purchased, raising the number of possible surgeries per three-hour

clinic session to four. The number of days allotted to the performance of the procedure was increased from one to two, and the shift of one gynecologist at the referral center was changed to cover for the gynecologist who was performing the surgeries. Another psychologist was trained to work with vasectomy clients. In 1999, after the cutoff date for the results reported here, the municipality opened a second referral center in another section of the city. As of late 2001, both referral centers are offering vasectomy services regularly. An average of six to eight vasectomies per week are performed in the older center; an average of one per week in the new one.

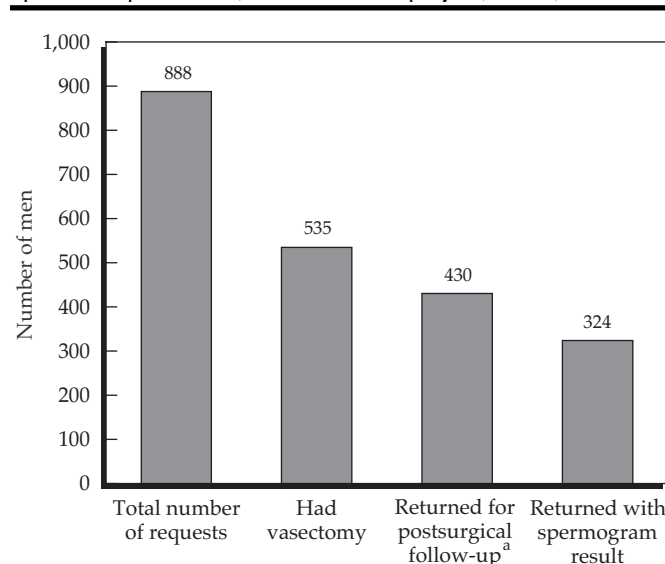
From June 1996 to March 1999, 888 men visited the referral center to request a vasectomy (see Figure 1). Of those, 535 men and their partners completed the entire process: They met all the eligibility criteria, participated in either one or two educational sessions, and in the psychological interviews, presented necessary documentation and underwent vasectomy. More than 80 percent of the men who had the surgery came to the first postoperative checkup between seven and 21 days after the surgery. The complication rate was low (less than 3 percent, including small hematomas and skin reactions) and is consistent with international rates (Filshie 1996). Sixty percent of the men returned to the referral center with the results of a sperm count one to three months after surgery with no sperm present in their semen. A higher rate of follow-up after surgery had been expected, because all men who had the surgery came more than two

times to the service, and they were repeatedly counseled on the need for follow-up. At least some of the men who did not return with the sperm count results may have learned directly from the laboratory or from another provider that their count was zero. Eleven men (2 percent) did not achieve a zero sperm count after two to three tests and underwent the procedure a second time. Four pregnancies occurred after vasectomy.¹⁵

Table 1 provides the demographic characteristics of the men who underwent vasectomy at the referral center. They came from lower-middle- and working-class families, and the majority (80 percent) had eight years or less of formal education. Their mean age—35.7 years—is considerably higher than the minimum age of 30 stipulated in the eligibility criteria.

Figure 2 presents the reasons why 353 applicants did not receive vasectomy services. The majority never returned after making an initial request for the surgery. They may have realized that they did not meet the eligibility criteria or they may have changed their minds without telling a service provider. Eighty-one were recorded as not meeting the eligibility requirements at the time of the request. A number of these men reportedly waited until they qualified and then returned for the procedure.¹⁶ That 30 men withdrew from the process after participating in the psychological screening interviews demonstrates the importance of the informed-choice process. If the surgery had been performed earlier, these men might have regretted their decision.

Figure 1 Number of requests for vasectomy and number of operations performed, Santa Barbara project, Brazil, 1996–99



^aNumber of men who returned between 0 and 28 days after surgery to check for surgical complications. The vast majority returned between 7 and 21 days post-surgery.

Source: Referral center service statistics for June 1996–March 1999 period.

Findings from Focus-group Discussions and Interviews

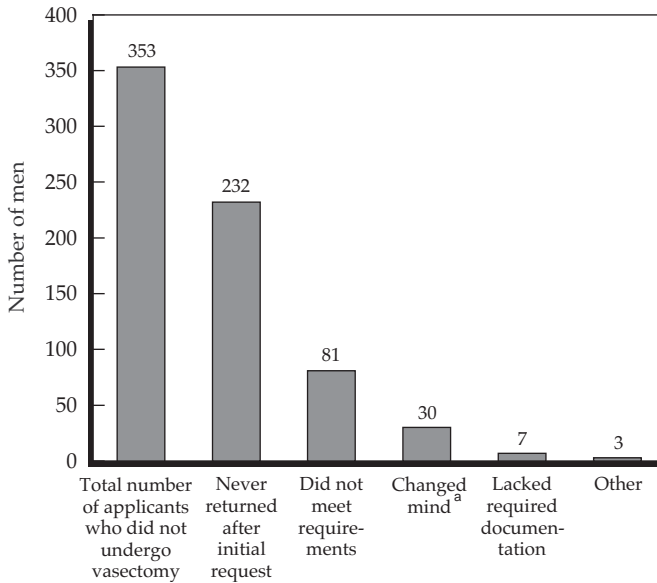
Focus-group discussions and individual interviews were conducted with male users of the referral center and with men who never used the clinic.¹⁷ The main purpose of

Table 1 Demographic characteristics of men who underwent vasectomy and percentage of men who underwent vasectomy, by educational level, Santa Barbara project, Brazil, 1996–99

Characteristic	Average and standard deviation
Age (years)	35.7 –5.0
Lived with current partner (years)	11.0 –4.3
Number of children	2.6 –0.9
Monthly family income	Reais \$673 ^a
Education	Percent
None	0.7
1–4 years	28.0
5–8 years	52.1
Some high school or degree	17.5
Some university or degree	1.6
(N)	(535)

^aFigure is approximately equivalent to US\$370.

Figure 2 Reasons why applicants did not receive vasectomy services, Santa Barbara project, Brazil, 1996–99



^a Men who changed their minds after completing the psychological screening interview.

Source: Referral center service statistics for June 1996–March 1999 period.

interviewing users was to assess responses to the service process. Interviews and focus-group discussions were conducted with: (1) 15 men who completed the eligibility process and obtained a vasectomy; (2) three applicants who discontinued the process of obtaining the procedure (discontinuers); and (3) six men who were not accepted to undergo sterilization (rejected men).¹⁸

The original intent had been to conduct only focus-group discussions. Arranging group interviews for the rejected men and for the discontinuers was difficult, however, because the total number of potential participants was small. Because attendance at the arranged interview times tended to be low, some of the groups were small, and in some cases, only individual interviews could be conducted. Given the small sample, findings and quotations presented below are illustrative of the opinions of individual men and not necessarily of all the men who did or did not receive services. The results reflect majority opinion unless otherwise stated.

Educational Sessions and Psychological Interviews

The men who had had vasectomies were highly satisfied with referral center services and viewed the educational sessions and psychological interviews as beneficial. They said that these services encouraged the participation of both partners, exposed them to other contraceptive options, alleviated fears, and gave them the tools to contemplate their decision fully:

I thought it was great, because everything was studied completely. It was discussed with the psychologist, it was discussed with a nurse, and my wife went, and there was an interview with us. . . . Everything was said—everything about women, everything about men—so that we would get inside the thing, to get to know [it], so that tomorrow we won't regret it.

They told me a lot of things in the visits that I still comment on with my wife. My wife also participated in one meeting. I remember all the things I saw in the meetings, and it was good because I really understood what I was doing.

It was nice. It alleviated us inside, relaxed us; it was important for us.

Five of the six rejected men interviewed did not undergo the procedure because they or their youngest child failed to meet the age eligibility criterion. Three returned, or intended to return to the referral center to have a vasectomy when they reached their thirtieth birthday or when their youngest child was one year old. Others obtained vasectomies outside the public health system but commented that they benefited from the referral center's educational sessions, and that no similar education or screening was provided to them in the private sector. One applicant who was rejected had considered undergoing vasectomy with a private doctor but then opted to wait until he fulfilled the age criterion to return to the referral center because he felt the quality of care there was better:

For me [the explanations] helped, because when I went to [have a vasectomy] with the other doctor, he wanted to charge a lot of money, and really, he didn't ask any questions of me. I would go there and put the money in his hand for him to do the surgery, and I would not know anything. . . .

The three discontinuers strongly believed that proceeding through the educational sessions and the psychological interview was meaningful because they help men and their partners consider all aspects and possible repercussions of the surgery. As one man remarked, sterilization regret is possible among some couples:

There are a lot of things to think about so that the partners do not blame one another. . . . The man and the woman have to have certainty in what they are doing, because . . . this is done for the rest of your life. . . . Then, if there is disequilibrium in the couple's relationship, and they separate, one might sue the other on that subject.

The Waiting Time

The amount of time men spent waiting to hear if they were approved or waiting to undergo the surgery varied considerably. At the beginning of the project, education, screening, approval, and surgery were completed in a matter of weeks. When demand for the surgery grew, however, and when the subsequent sterilization law mandated the two-month waiting period, the process became lengthy. Men offered mixed responses about waiting time. Some of the men who had undergone vasectomies viewed this time as an opportunity to increase their own and their partners' confidence about the procedure:

I also liked [the waiting time] because it gives [you] time to think, to take into account the opinion of the husband and the wife, because sometimes you are not fully informed, you are not really wanting [to have the vasectomy].

Other men in this category argued that the waiting time was too long. Because they were already secure in their decision, they felt they should not have to wait. They argued that there are men who want a vasectomy but consider the process daunting, time-consuming, and complicated:

There are many people who want to have the operation, but the problem is that people are thinking that it takes too much time and there are a lot of people already waiting. The majority of men . . . want to do something quickly. It is not like the woman who thinks a lot more. The guys who work in my firm said, "It is a very complicated thing, you go and you schedule, then there is the interview, then it takes more or less one month to see if you are approved in that interview." There are many men who would like it to be faster. I don't know if it could be done this way.

For the three men who opted to wait until they had fulfilled the eligibility criteria, the waiting period became very lengthy. They considered the waiting a hardship:

It was discouraging to have to wait. I kept spending money on condoms without being able to afford it. My wife was taking pills, which were giving her bad side effects.

The Selection Criteria

Most of the men who had had a vasectomy, as well as those who were rejected, understood the reasons for and agreed with the selection criteria. Not surprisingly, the men who underwent vasectomy had the fewest objections to the selection criteria. They considered them ap-

propriate and agreed in particular with the required minimum number of children. Others argued that if a man is determined to undergo vasectomy, the criteria could be more flexible, especially with regard to the minimum-age requirement.

The men who were rejected because they did not meet the age requirement agreed that this requirement could safely be lowered to 25 or suspended on a case-by-case basis without resulting in sterilization regret:

I am 26; at 22 I already had two children, and I didn't intend to have more. They should analyze this idea more and work more on this. Why wait until 30? I have to wait four years and in these four years anything might happen.

Respondents in the three groups agreed that having some minimum number of children should be required. In most cases, two children was an agreeable number, although some men felt that three would be appropriate as well. Although one rejected man agreed that a minimum of two children is important, he said that he felt it unnecessary to have to wait to have a vasectomy until the youngest child is one year old:

I think for the number of children, the minimum of two is important. But in the case of [waiting one year], the Ministry of Health says a lot of children die before turning one year [old]. But here this is difficult to find. In our region, no. This [situation] might be true in the North, but not here. Then generally, the person has one child, then has a second, and is already planning to have [the vasectomy]. [After] the second is born, he can do it right away. Having to wait one year is a long time.

Providers

Although initially the project personnel had reservations about training a gynecologist to perform vasectomies, this choice proved not to be a barrier for either the men or the providers. Men who underwent the procedure stated that all the providers were entirely professional and that they were confident in the staff's abilities:

In general, all of the people are fantastic. They have a way of attending that is really very good. We go with an expectation [that things will be bad]. We arrive there, and it is totally different. We became even more motivated. . . . Then for all the dates that were scheduled, when we arrived, the schedule was correct and went as planned.

The service was impressive. There was a nurse who seemed to us as if we'd known her for ten

years. . . . When I came back to do the other exams, she made several jokes. And at the time of the surgery, I felt very comfortable because of this.

The respondents who were rejected and those who discontinued agreed that all of the referral center staff were good, very good, or excellent.

The Cost and Quality of Services

All respondents were impressed with the quality of the services they received and were surprised that such high-quality care could be found in the public health system.

I was worried about the line. . . . In the beginning, I thought, because it is a public service, certainly there is a group of people [who would get preference]. Then I went there to find out. I would have to wait approximately three months. First I thought it was because of the number of people. Then I discovered it was not. It was just because of the interviews. I saw that, in truth, the service really worked: The judgment I was making against this public service was totally wrong. The attendance was fast, even, and without problems.

Many men viewed the service as a benefit to the community, particularly because it is free of charge:

A place like this was always needed. Let's suppose there are some people who don't have options to buy a condom. Contraception is very expensive today. Let's suppose the pill costs about seven to eight reais,¹⁹ and there are people who are not in a position to afford it. Then a person looks for a place like this that provides a [contraceptive] method.

At least they give the option for a person, because really those who need [vasectomy] are the poorest people, because generally, they have seven, eight, or ten children.

The high quality of vasectomy services received through the public health system was recognized as a departure from the norm, and the men interviewed recognized and appreciated this point:

In this case, it could be like a model, here in Santa Barbara d'Oeste. I thought it was strange that it was happening here, because it is considered a small city—a health service like this that deals with these types of things. It was interesting for the city.

I would have had money to go to a private service, but after going to a private clinic to have a consultation, I finished going to the referral center for the vasectomy, because I think that there we are treated like human beings, a different kind of treatment compared with the private clinic. Some friends had the operation at private clinics where the physician came to the room, asked them to take off their pants, and did the surgery.

Because the cost associated with a vasectomy in the private sector can be prohibitive (\$200 in Santa Barbara), one man planned to wait until he fulfilled the age criterion to have a vasectomy at the referral center:

In my case, I would do it if I could do it without paying. I don't have the ability to pay. The vasectomy is cheaper than the tubal ligation. It is better for the man to do it than the woman, because when the woman does the tubal ligation, she begins to have problems. I have in my mind that I'm going to have a vasectomy one day, for certain, and I have to wait in this case because it is for free there [in the referral center], but it has some requirements.

Services for Men and Women in the Same Locale

Although some disagreement has been voiced in the literature about whether men would be equally responsive to services that are provided in mixed male–female service settings (Vernon 1996; AVSC 1997; Wegner et al. 1998), most male respondents considered it normal for men and women to receive services in the same place:

I thought it was very natural. Because there in the waiting room we were talking, there was a woman who was getting an IUD. There was also a woman who said, "Oh my husband doesn't want to do [the vasectomy] then I'm going to do [tubal ligation]!" Then I said, "I think if the men do it, it is a lot simpler, because for the women, it is not so simple." Then we were there together talking without prejudice, without anything.

Although participants were responsive to receiving services in a reproductive health referral center that predominantly serves women, this may not be true in all settings, even in other areas of Brazil. Cultural norms and local customs play a role in whether men and women will be comfortable seeking reproductive health services in the same location.

The Influence of Friends and Colleagues

The focus-group discussions and interviews confirmed a general finding from the literature that men's friends and colleagues are often among their most important sources of information and referrals for vasectomy (Vernon 1996). Most respondents had heard about the service from their friends and colleagues. A few had learned about it from partners, family members, or family friends who had attended the service or knew someone who had. Because no explicit advertising was undertaken, this result is not surprising.

Undoubtedly, a satisfied clientele generates further demand. In Santa Barbara, where the services were considered to be of high quality, men recommended the procedure to their friends. Many respondents who had had a vasectomy said they had already done so. One client was asked to rate the service on a scale of one to ten:

I would say that the service is good; it is a ten. I already recommended it to three people. The three already went there and are in the process.

Another man described how his communication with other men draws an increasing clientele to the service. He believed that men's attitudes toward participating in family planning are changing with the times, and that men who opt for vasectomy play an active role as opinion leaders in facilitating that change:

I think that gradually the men will become accustomed to this, because there are a lot of people doing the surgery, and . . . from one person passing [information] to another. . . . They ask how it is, how it is not. I already passed this [information] to many of my colleagues. Many of my colleagues had been afraid, and now they are making appointments to have the surgery.

One man who knew that his church was opposed to sterilization was, nevertheless, willing to share his opinion about vasectomy with others because he believes in its benefits:

I talk to my peers in my community, in the church. . . . I talk a lot about it because I am happy doing so. I am not going to change my mind because the church does not like [vasectomy]. If I think that my decision is correct, I transmit this to you and if you also [think] that it is correct, you transmit it to others.

The opinions of friends and colleagues can also discourage men from seeking to have a vasectomy. For example, one man discontinued because he had heard from a friend who had undergone a vasectomy that an

annual follow-up was required, and he did not want to have one. Another discontinued because his friend had had a vasectomy that he later regretted. The theme of possible sterilization regret resulting from insecure marriages was raised more often by the discontinuers than by the other groups.

Other Men's Opinions

Participants were asked whether they thought other men in the community have the same views as they do about various topics related to men's role in family planning and services for men. Responses varied considerably. Respondents were aware that men's conservative attitudes toward having a role in fertility regulation persist, but at the same time they recognized signs of change:

Nowadays it is changing. Where I work, they had a facility for performing [vasectomies], without so much bureaucracy, and the majority there already had them. A man used to think that he would not be a man anymore. Nowadays, it's changed a lot, at least among the people I know.

Men's fear of the procedure and their machismo were important themes:

There are men who don't want to have the operation and they are afraid. Look, I already talked with more than 40 men. I said, "Stop being stupid. I used to be afraid. I used to say that I would never be operated on. What if one day I finish with my marriage?" I said, "Now I have three children, how many more children am I going to want?" My life is already set: I am already 40 years old.

Other men who had had vasectomies talked about rectifying incorrect information about the surgery and about counteracting ridicule:

One of my brothers-in-law said that I would become homosexual because I was to be operated on (*laughter*). I'm saying that there are people [who think this], but it is not common.

Do you know what is said to me, "Ah, you had a [vasectomy], you must be weak." I said, "I will get your wife" (*laughter*). "Get your wife and bring her to my wife and then they can both talk together in front of us. Ask who has more sexual potency, is it me or you? Send your wife to talk with mine, and mine can tell yours. I want to see which one of us is going to laugh in the other's face."

Men who opted for a vasectomy see themselves as innovators and opinion leaders, and in Santa Barbara d'Oeste, they spread a positive message not only about the procedure but, as was apparent from previous quotations, about the service as well.

Local Men Never Used Municipal Services

Two focus-group discussions with a total of 15 participants were conducted with local factory workers who had never used referral-center services but who were sexually active and had not had a vasectomy. Although these men do not constitute a control group in the strict sense of the term, they provide a point of comparison with clinic users. The men in one focus group were covered by health insurance, which meant that neither they nor their families use the public health services. The men in the second focus group and their families were more apt to seek public-sector health services, and a few stated that their wives had consulted a municipal facility for family planning.

Although the majority of both groups had heard of vasectomy, their knowledge tended to be limited. Some knew men who had undergone vasectomy, but most did not. Both groups of men reported they had heard the prevalent negative beliefs about vasectomy including the view that it is taboo, that it makes a man impotent, that a man who has had one can lose his ability to enjoy sex, or that having one will make him become homosexual. This last response was uncommon, however. Some men agreed with these views, while others did not or could not comment.

Some respondents were aware that vasectomy is a simpler procedure than tubal ligation. Many argued, however, that vasectomy is not common among men because men find it easier to let women undergo sterilization and because men are afraid or macho. In fact, when the respondents were offered the hypothetical choice of receiving either tubal ligation or vasectomy for free, the majority who replied said that they would choose the former.

The majority in both focus groups emphasized that men need more information and education about family planning in general, but particularly about vasectomy, to eliminate misunderstandings, fears, and biases concerning the method. When one man suggested that health educators come to the workplace to provide reproductive health information, the rest of the group strongly supported this idea on the grounds that men do not actively seek such information and would benefit from outreach. They all felt that many men, once educated, would choose vasectomy. Respondents had

no objection to having men's and women's family planning needs served at the same health facility.

Conclusions

This study demonstrates several important points about public health services for men and about the introduction of new contraceptive services more generally. First, the evidence shows that the introduction of services for men in a small municipality in southeastern Brazil was successful. The main focus of the new services was male surgical contraception. Given the limited resources within the municipal sector, additional services for men were limited to condom distribution and educational sessions. Initially, the service experienced more demand for vasectomy than had been expected. The services offered were, on the whole, perceived to be satisfactory by those who went through the process. In turn, satisfaction generated further demand. These results are consistent with reports in the literature that the low prevalence of vasectomy often results from an inadequate supply of services and not necessarily from a lack of demand. At the same time, interviews with local men showed that male prejudice against shared responsibility for fertility control and especially against vasectomy continues, although signs of change were also reported.

Second, the emphasis on quality of care and reproductive choice played an important role in ensuring the success of the vasectomy program. Ensuring an informed-choice process as well as a high level of technical competence in service provision were the guiding principles of the project. With careful attention to counseling and screening, couples entered into the decision to undergo vasectomy in a secure and well-informed way.

Third, this case demonstrates that vasectomy and related contraceptive services for men could be successfully added to a women's health program. Clearly, services for men and women cannot always be integrated. A variety of factors, in particular cultural ones, may influence the decision to provide integrated or separate services (Wegner et al. 1998). In this Brazilian setting, however, integration of services worked well and was cost-effective.²⁰ The referral center and its staff could absorb the new program with relative ease and, given the strong political support of the program, the limited additional resources required could be mobilized from existing public-sector budgets.

The wider structural and quality-of-care improvements undertaken in the Santa Barbara project prior to initiation of vasectomy services were essential. The introduction of new technologies and services can only

succeed if the organizational capacity exists to provide new services with appropriate levels of quality of care (Spicehandler and Simmons 1994; Simmons et al. 1997). These broader changes as well as the addition of vasectomy services were accomplished with strong external technical support but with a minimal infusion of external resources.

Fourth, the critical challenge of sustainability was successfully met. Shortly after initiation of vasectomy services, the survival of the new program was threatened by the election of a new mayor from an opposition party who initially decided to discontinue the overall Santa Barbara project as well as the vasectomy component. Because the Santa Barbara project had strong community support, the new mayor changed his mind and allowed the project, including the vasectomy component, to continue. The fact that 100 men were on the waiting list for a vasectomy at the time also contributed to the decision, because the mayor perceived that closing the project might have negative political repercussions.

The project has continued successfully since then and, as indicated above, services were expanded to a second referral center in 1999. Both referral centers have been providing services without external technical or financial support. The senior gynecologist of the first referral center is now also providing vasectomy training for other municipalities that are participating in the Reprolatina project designed to replicate innovations tested in Santa Barbara to other parts of Brazil.

Finally, one of the least tangible benefits of implementing a vasectomy program may be the longer-term impact on gender relations in family planning. Men who have undergone vasectomies act not only as opinion leaders in support of male sterilization but also they disseminate new norms related to men's involvement in fertility regulation. For the first time in this setting, many men were invited to help make contraceptive decisions together with their partners—a task that traditionally had fallen to women alone. Men seemed to appreciate the opportunity to contribute to safeguarding the health of their partners. By not fostering an artificial gender divide in issues of sexuality and reproduction, the service acts to enhance mutual understanding and improve relationships.

By itself, a project organized in a single municipality cannot answer the question of how to provide family planning services for men through the municipal health services in Brazil. It provides, however, a model from which others can learn. At a time when men's resistance to participation in family planning may be starting to erode, good and affordable vasectomy services offered through the municipal health system provide a powerful message.

Notes

- 1 The Colombian nongovernmental organization Profamilia provides vasectomy and other services for men through its widespread service network of male clinics and as an integrated component of reproductive health services for women (AVSC 1997). Profamilia uses a sliding fee scale for services. The Instituto Mexicano del Seguro Social (IMSS) in Mexico is a major branch of the national health service system, which provides health care for people employed in the formal sector of the economy except for those employed by the government. Vasectomy services are provided free of charge at the primary health-care level of the IMSS clinic network throughout the country (Jezowski et al. 1995). Pro-Pater, based in São Paulo city, provides a broad range of sexual and reproductive health services for men in a few large metropolitan areas. They have offered vasectomy since 1981, and the demand for services increased substantially in response to mass media campaigns in 1985 and 1989 (Foreit et al. 1989; Kincaid et al. 1996).
- 2 As noted above, Pro-Pater and Profamilia are both nongovernmental organizations. Pro-Pater serves large metropolitan areas but does not provide services on a regional or national scale. Profamilia, by contrast, has an extensive service infrastructure that reaches large segments of the Colombian population, but the program does not have to work within the resource constraints and political-administrative complexities of the public sector. The IMSS program in Mexico is a public-sector program but is resource-rich in comparison with the national health-care system of the Ministry of Health in Mexico.
- 3 The 1996 Demographic and Health Survey interviewed both married and unmarried men and women and found that the contraceptive prevalence rate among married men was reportedly 73 percent. Of the married men practicing contraception, 40 percent were married to women who had undergone sterilization, 5 percent used condoms, and 2 percent had undergone vasectomy. The prevalence rate reported here is for married women because that has been the convention.
- 4 Pro-Pater has been instrumental in increasing awareness of and access to vasectomy in the São Paulo metropolitan area as well as in other cities, and has also been an important source of vasectomy training.
- 5 CEMICAMP is a nongovernmental organization affiliated with the State University of Campinas.
- 6 Santa Barbara d'Oeste, a municipality in central-western São Paulo state, was selected as the locale for this project because of severe deficiencies in its family planning services because of its location near CEMICAMP—the implementing research agency—and because its health secretary and mayor had a strong commitment to improving services.
- 7 Tubal ligation could not be offered through the municipal health services, because Santa Barbara's hospital is not under municipal jurisdiction.
- 8 The participatory process employed in the Santa Barbara project is described in Díaz and Simmons (1999).
- 9 The gynecologist recruited for the referral center was committed to the project and willing to work the required number of hours. He saw the position in the newly created referral center as an opportunity for professional growth. The presence of a gynecologist was essential to upgrade the referral center in the area of women's health. Any other primary care physician could have been trained to provide the vasectomy services, and the psychologist could have been replaced by a nurse or a social worker.

- 10 The vasectomy kit is a stainless steel box containing the Lee forceps—the special tool used to grasp the vas after the puncture has been made—other forceps that help in the dissection of the vas, two Kelly forceps used for the puncture of the scrotum and grasping of a blood vessel, and a syringe for the anesthesia. The only specialized instrument is the inexpensive forceps used to grasp the vas. The total kit costs about US\$80 and can be used for hundreds of procedures. The only additional materials needed are sutures and a local anesthetic, costing approximately \$10.
- 11 Some men who knew they were interested in vasectomy bypassed the first educational session and participated only in the second one. One member of the couple attended the first session, and in many cases, both did; both attended the second one.
- 12 The screening interview was an innovation introduced by the project. It is neither required by law nor is it conducted at the RHC-UNICAMP.
- 13 Although the data on this issue are not consistent and recommendations are variable, following the more conservative guidelines was considered advisable.
- 14 Condoms were not given to men who were already using them and were in the habit of purchasing them.
- 15 One man experienced a contraceptive method failure, but had never had a sperm count performed. A second man had a zero sperm count, but evidence was found of laboratory error in his case. A third man also had a zero sperm count, again probably a laboratory error. The fourth man had sperm present at his first sperm count and was subsequently counseled to use condoms and return again after one month but the couple became pregnant during that month. A second postpregnancy sperm count revealed sperm present in his semen.
- 16 The records available do not allow identification of how many of the men who had vasectomies came from this group.
- 17 Focus-group and individual interview guidelines for sessions with male clinic users and nonusers were developed by the research team and employed in all sessions. Moderators were members of the research team who were not involved with delivering vasectomy services. All focus-group discussions and interviews were taped, transcribed, and coded according to criteria set by the research team. Relevant passages were translated and edited slightly to ensure grammatically correct English.
- 18 Respondents were selected from the clinic log book according to the three categories of respondents. Men were invited by letter to come to the interview.
- 19 One real at the time of the focus-group discussions was equivalent to US\$1.80. Consequently seven or eight reals were equivalent to \$4.00–4.50.
- 20 For a similar argument see AVSC's 1998 symposium report on male participation (AVSC and IPPF 1999).

References

- Atkins, Beth S. and Terence W. Jezowski. 1983. "Report on the first international conference on vasectomy." *Studies in Family Planning* 14(3): 89–95.
- AVSC International. 1997. *Profamilia's Clinics for Men: A Case Study*. New York: AVSC International.
- AVSC International and IPPF/Western Hemisphere Region. 1999. *Male Participation in Sexual and Reproductive Health: New Paradigms—Symposium Report*. New York: AVSC International and International Planned Parenthood Federation, Western Hemisphere Region.
- BEMFAM and Demographic and Health Surveys (DHS)/Macro International. 1997. *Pesquisa Nacional Sobre Saúde Demografia e Saúde, 1996*. Rio de Janeiro: BEMFAM.
- Benger J.R., S.K. Swami, and J.C. Gingell. 1995. "Persistent spermatozoa after vasectomy: A survey of British urologists." *British Journal of Urology* 76(3): 376–379.
- de Castro, Marcos Paulo P. and Bernadette Martin de Castro. 1995. "Meeting men's reproductive health needs: Pro-Pater in Brazil." In *INNOVATIONS: Innovative Approaches to Population Program Management* Volume 3. Eds. Jay Satia and Sharifa Tahir. Kuala Lumpur, Malaysia: International Council on Management of Population Programmes (ICOMP). Pp. 11–22.
- Díaz, Margarita and Ruth Simmons. 1999. "When is research participatory? Reflections on a reproductive health project in Brazil." *Journal of Women's Health* 8(2): 175–184.
- Díaz, Margarita, Ruth Simmons, Juan Díaz, Carlos Gonzalez, Maria Yolanda Makuch, and Debora Bossemeyer. 1999. "Expanding contraceptive choice: Findings from Brazil." *Studies in Family Planning* 30(1): 1–16.
- Faúndes, Anibal and J.G. Cecatti. 1993. "Which policy for caesarian sections in Brazil? An analysis of trends and consequences." *Health Policy and Planning* 8(1): 33–42.
- Filshie, M. 1996. "No-scalpel technique for vasectomy." *European Journal of Contraception and Reproductive Health* 1(3): 231–235.
- Foreit, Karen C., Marcos Paulo P. de Castro, and Eliane F. Duarte Franco. 1989. "The impact of mass media advertising on a voluntary sterilization program in Brazil." *Studies in Family Planning* 20(2): 107–116.
- Formiga, Jose Noble, Simone Grillo Diniz, Ruth Simmons, Elizabeth Cravey, Peter Hall, S. Sorrentino, Margarita Díaz, Luis Bahamondes, Juan Díaz, and Maria Yolanda Makuch. 1994. "An assessment of the need for contraceptive introduction in Brazil." Geneva: World Health Organization. Document number WHO/HRP/ITT/94.2.
- Hardy, Ellen, Luis Bahamondes, M.J. Osis, R.G. Costa, and Anibal Faúndes. 1996. "Risk factors for tubal sterilization regret, detectable before surgery." *Contraception* 54(3): 159–162.
- Jezowski, Terence W., Francisco Alarcón, Consuelo Juarez, Alcides Estraa, and Fernando Gomez. 1995. "A Successful National Program for Expanding Vasectomy Services: The Experience of the Instituto Mexicano del Seguro Social." *AVSC Working Paper* No. 8. New York: AVSC.
- Johnson, J. Timothy and Beth A. Macke. 1996. "Estimating contraceptive needs from trends in method mix in developing countries." *International Family Planning Perspectives* 22(3): 92–96.
- Kincaid, D. Lawrence, Alice Payne Merritt, Liza Nickerson, Sandra de Castro Buffington, Marcus Paulo P. de Castro, Bernadette Martin de Castro. 1996. "Impact of a mass media vasectomy promotion campaign in Brazil." *International Family Planning Perspectives* 22(4): 169–175.
- Simmons, Ruth, Peter Hall, Juan Díaz, Margarita Díaz, Peter Fajans, and Jay Satia. 1997. "The strategic approach to contraceptive introduction." *Studies in Family Planning* 28(2): 79–94.
- Sivardeen, K.A. and M. Budhoo. 2001. "Post-vasectomy analysis: Call for a uniform evidence-based protocol." *Annals of the Royal College of Surgeons of England* 83(3): 177–179.

- Smith, A.G., J. Crooks, N.P. Singh, R. Scott, and S.N. Lloyd. 1998. "Is the timing of post-vasectomy seminal analysis important?" *British Journal of Urology* 81(3): 458–460.
- Spicehandler, Joanne and Ruth Simmons. 1994. "Contraceptive Introduction Reconsidered: A Review and Conceptual Framework." Geneva: World Health Organization. Document number WHO/HRP/ITT/94.1
- United Nations. 1998. "World Contraceptive Use 1998." <<http://www.un.org/popin/wdtrends>>.
- Vernon, Ricardo, Gabriel Ojeda, and Ana Vega. 1991. "Making vasectomy services more acceptable to men." *International Family Planning Perspectives* 17(2): 55–60.
- Vernon, Ricardo. 1996. "Operations research on promoting vasectomy in three Latin American countries." *International Family Planning Perspectives* 22(1): 26–31.
- Vieira, Elizabeth Meloni and Nicholas John Ford. 1996. "Regret after female sterilization among low-income women in Sao Paulo, Brazil." *International Family Planning Perspectives* 22(1): 32–37, 40.
- Wegner, Mary Nell, Evelyn Landry, David Wilkinson, and Joanne Tzanis. 1998. "Men as partners in reproductive health: From issues to action." *International Family Planning Perspectives* 24(1): 38–42.

Acknowledgments

The vasectomy program and the Santa Barbara project were partially supported by funds from the World Health Organization's Strategic Unit for the Introduction and Transfer of Technologies for Fertility Regulation, UNDP/UNFPA/WHO/World Bank Special Programme of Research, Development and Research Training in Human Reproduction (HRP), Geneva. Analysis of the vasectomy component of the project was partially funded by the Bill and Melinda Gates Foundation. We are indebted to Anibal Faúndes, President of CEMICAMP, for his ongoing support to the project. The authors gratefully acknowledge the support of Carlos Gonzalez, the PAISM coordinator, and Carlos Cavalcante, the Secretary of Health of Santa Barbara d'Oeste when the project was initiated. Max Heirich's extensive editorial support was appreciated. Maria Yolanda Makuch, Maeve de Mello, Victoria Montrone, and Marlei Carrera provided valuable research support. The authors also wish to thank the municipal health providers and community members of Santa Barbara d'Oeste, who graciously gave their time and energy to this project.