

Impact of a Mass Media Vasectomy Promotion Campaign in Brazil

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A mass media campaign to promote vasectomy in three Brazilian cities (São Paulo, Fortaleza and Salvador) consisted of prime-time television and radio spots, the distribution of flyers, an electronic billboard and public relations activities. Clinic data indicate that the monthly mean number of vasectomies initially increased during the six-week campaign by 108% in Fortaleza, by 59% in Salvador and by 82% in São Paulo. An in-depth analysis of the São Paulo clinic data indicates that during the campaign, television replaced personal sources as the dominant source of referrals among men who made telephone inquiries to the clinics. A regression analysis based on São Paulo clinic records for 12 years confirmed that periodic mass media promotions helped alleviate but did not halt the general downward trend in clinic volume over time. Increases in the cost of vasectomy and in alternative sources for the operation contributed to the lower volume.

(International Family Planning Perspectives, 22:169–175, 1996)

Vasectomy has been available throughout much of the world for decades, and it has become a major family planning method in some countries. By 1991, vasectomy had been chosen by approximately 41.5 million couples worldwide.¹ About three-fourths of vasectomy users are concentrated in China and India, where government programs have long supported the method. In China, for example, an estimated 30.4 million men received vasectomies between 1971 and 1981; the method accounted for 11% of all contraceptive use in 1981, a proportion exceeded only by the proportions of couples using the IUD (42%) or female sterilization (38%).²

Chinese vasectomy rates vary greatly, however, by province and region. While some research has ascribed these important regional differences to socioeconomic, cultural and service quality factors,³ other studies have attributed higher rates in China's Sichuan Province to vasectomy promotion

and endorsement by party members⁴ and to educational campaigns that provide specific information relevant to sterilization candidates' needs.⁵

In Africa, where vasectomy is very rarely used, a Kenyan nongovernmental organization implemented a mass media vasectomy promotion project in 1992–1994.⁶ The intervention, conducted by Innovative Communication Systems, used a wide array of promotional techniques—on-site training for service providers, periodic television talk shows, newspaper advertisements with coupons directing men to family planning sites, newspaper articles, film clips, booklets, posters, leaflets and flyers, and motivational talks held at work sites. (One of the planned components of the campaign, radio and television promotional spots, had to be canceled, however, because of the Kenyan Broadcasting Corporation's fears of public and political backlash. The private Kenyan Television Network eventually broadcast the spots, but in the Nairobi area only.)

Twelve-month monitoring of service records in six sentinel vasectomy sites showed that even though the cancellation of the planned broadcast weakened the campaign considerably, the number of vasectomies performed had increased by 125% after six months of the Kenyan campaign. Clients who cited newspapers as their main source of referral were more likely to have made a vasectomy-related visit to a clinic than were those referred by other sources. By the end of the project, 835 individuals had requested vasectomy in-

formation using the newspaper coupons.

Several Latin American countries have also developed mass media communication approaches to increase vasectomy promotion. In Guatemala, for example, a project used radio spots and a male promoter to increase awareness and acceptability of vasectomy.⁷ An evaluation of the project found that although knowledge and attitudes in the experimental groups did not significantly improve compared with those in the nontreatment group, the number of vasectomies performed increased significantly.

A similar project in Colombia used a clinic-oriented mass media approach⁸ and tested three types of experimental clinics—a traditional clinic offering both male and female services simultaneously; a traditional clinic with specially designated hours for men only; and a male-only clinic. Outreach activities promoting the clinics included a five-month mass media campaign with radio spots, newspaper advertisements and leaflets distributed at workplaces. Experimental clinics performed nearly twice as many vasectomies as control clinics during the project.

The Brazilian Context

Brazil had a modern contraceptive prevalence rate of 55% in 1986, with the pill and female sterilization together accounting for nearly 95% of all modern method use.⁹ The total rate of modern contraceptive use for São Paulo state in 1986 was 62%, and this state also had the highest rates of use of male methods (3.1% for the condom and 2.4% for vasectomy). These levels of use were due in part to the opening of the first male-oriented health and sexuality clinic by Promoção da Paternidade Responsável (PRO-PATER) in São Paulo in February 1981.¹⁰

PRO-PATER was founded to provide medical and educational services for male contraception and sexuality. In addition, it conducts biomedical and psychosocial research on fertility, infertility and male sexuality. In May 1988, PRO-PATER inaugurated a second São Paulo clinic, which targeted men from lower socioeconomic groups.

Initially, PRO-PATER relied mostly on word-of-mouth communication from sat-

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ified clients to promote its services. In 1983, however, a three-minute broadcast about vasectomy and PRO-PATER on national television reached an estimated audience of 40 million people. Clinic attendance in the month after the broadcast was double that of the previous month, and the number of vasectomies performed in 1984 exceeded those done in the previous year by 50%. In 1985, after a 10-week newspaper and magazine promotion conducted with assistance from The Population Council, the mean daily number of new clients increased by 60%, and the mean number of vasectomies performed per day increased by 54%.¹¹

The 1989 Campaign

In 1989, PRO-PATER collaborated with the Johns Hopkins University Population Communication Services project, with funding from the U.S. Agency for International Development, in a mass media communications project to promote vasectomy in three Brazilian cities—São Paulo, Salvador and Fortaleza. These three are among the five largest cities in Brazil.* This article presents the results of an evaluation of the impact of this mass media campaign.

One clinic in the developed South (PRO-PATER in São Paulo) and three clinics in the less-developed Northeast participated in the project. The Northeast clinics were the Centro de Estudos, Pesquisa e Atendimento em Reprodução Humana (CEPARH) in Salvador and two clinics affiliated with the Programa de Orientação e Planejamento Familiar (PRO-VAS) in Fortaleza. CEPARH was established in 1984 and offers contraceptive services to women as well as men; PRO-VAS was founded in 1987 solely to provide male contraceptive services.

The 1989–1990 project attempted to standardize the information provided to potential vasectomy clients and to eliminate some of the public's misconceptions about how the operation is performed, its effect on sexual functioning and its long-term health effects. The specific communication objectives were to increase knowledge and awareness of vasectomy and to increase

the number of vasectomies obtained by lower-middle-class men aged 25–49. Our article presents quantitative data from the evaluation of the second objective.

The 1989–1990 campaign was implemented in four distinct phases: Precampaign public relations events were held; television spots were broadcast in May and June of 1989; these spots were rebroadcast in September of 1989; and a follow-up minicampaign was conducted early in 1990. The slogan "Vasectomy is an act of love" served as the main theme for the campaign. A 30-second television spot was developed and pretested by a local advertising agency (the Denison Agency) in four focus-group discussions with vasectomized and nonvasectomized ever-married men aged 25–49. Discussion group responses were used to revise the advertisement.

The television spot featured a pair of animated hearts—one male, one female—that depicted the purpose of vasectomy, its safety and its noninterference with love-making. In the final version, the two animated hearts entered the screen to wedding music. Through animation and the sounds of excitement and kissing, the hearts united twice and produced babies—little dancing hearts.

On the male's third attempt to unite with his partner, the female scolded him and pushed him away. A vasectomy was depicted by two bars drawn across the male heart. A voiceover then said: "Vasectomy, the male operation, is a quick and painless way to avoid unwanted pregnancies." Once again, the two hearts united to the sounds of kissing and excitement. The campaign slogan closed the spot. This was followed by the tag line, "For further information, contact (clinic name and phone number)."[†]

A companion piece for radio featured a father explaining vasectomy to his son, followed by the same slogan and tag line. To maintain consistency and reinforce the television message, the pamphlets, billboard and magazine ads all used the same image of two amorous hearts.

A precampaign public relations promotion to generate interest among the print and electronic press was also conducted in the three cities. Activities included issuing press releases that described the project and personally contacting key members of the Brazilian press.

The main television campaign ran from May 18 to June 30, 1989; on the day before the campaign was launched, the advertising agency held a press conference at PRO-PATER for representatives of 10

broadcast and print news organizations. The head of the clinic also appeared on a variety of television talk shows.

The rebroadcast of the television spots from September 19 to 29 (on the same broadcast schedule of 2–5 times daily from 8:00 p.m. to midnight) ran unaccompanied by additional events. The follow-up minicampaign from January 2 to March 4, 1990, consisted of an ad in the mass-circulation magazine *Veja*, an electronic billboard in downtown São Paulo with the "dancing hearts" motif and a direct mailing of pamphlets to *Veja* subscribers.

Between March 1989 and June 1990, the campaign and the events surrounding it stimulated roughly 70 news stories on television, radio, daily newspapers, trade journals, weekly and monthly magazines, and television talk-show discussions. The precampaign public relations efforts exposed editors and reporters to the campaign, so the spot itself (and the awards it earned) generated cost-free publicity in the form of news coverage. During the campaign, the press coverage extended spontaneously beyond the three clinic cities to at least seven others. In the total 15-month period, the combined public relations activities and press coverage reached an estimated four million people.¹²

Evaluation

We evaluated the campaign by examining clinic records and sources of referral. While baseline and follow-up sample surveys of men in São Paulo and Salvador were also conducted, those results are reported elsewhere.¹³ We present here the data from clinic records and from brief interviews conducted with callers, visitors to the clinics and patients. The mean numbers of monthly visits and calls, and the mean monthly numbers of vasectomies, for PRO-VAS in Fortaleza, CEPARH in Salvador and PRO-PATER in São Paulo were available for the seven months preceding (October 18, 1988, through May 17, 1989) and the five and one-half months immediately following (July 1 through December 15, 1989) the six-week campaign (May 18 through June 30, 1989); thus, any effects from the subsequent January–February 1990 minicampaign are not reflected in these data.

Calls and visits to the clinics increased markedly during the campaign: The average number of calls and visits per month at the PRO-VAS clinics in Fortaleza increased from 15 to 35 during the campaign, an increase of 133%. In the six months afterwards, the monthly mean dropped to 12, a level even lower than that seen in the six months before the cam-

*São Paulo is one of the largest cities in the world, with a 1994 population of roughly 16 million people. (See: United Nations Population Division, *Urban Agglomerations*, 1994, wall chart, New York, 1995.)

†The "dancing hearts" advertisement was popular among diverse audiences and won various national media awards and three advertising industry awards—the gold medal at the Fourth London International Advertising Awards, the bronze medal at the 32nd International Festival of Publicity Films in New York, and the "Bronze Lion" medal at the 37th International Festival of Advertising Films in Cannes, France.

paign.* At the CEPARH clinic in Salvador, mean monthly calls and visits increased by 169% (from 39 to 105), and thereafter fell to 85, or an increase of 118%.

The most dramatic change occurred at the PRO-PATER clinic, where mean monthly calls and visits first increased by 261% (from 529 in the six months before the campaign to 1,911 during the campaign), then fell back to a level of 679 in the six months following the campaign, representing an increase of 28%. Thus, the television spots seem to have generated a substantial increase in the number of calls and visits to the clinics.

The monthly mean number of vasectomies performed at the PRO-VAS clinics increased from 12 in the six months preceding the campaign to 25 during the campaign, and then fell to seven in the six months following completion of the campaign. These numbers reflect an initial increase of 108%, and a subsequent decrease of 42%. The mean monthly number of vasectomies performed at CEPARH increased from 32 to 51 during the campaign, and continued to increase to 59 in the six months following the campaign, for an intermediary increase of 59% and a later increase of 84%. Vasectomies performed at São Paulo's PRO-PATER clinic increased by 82%, from a mean of 303 a month in the six months before the campaign to 550 during it. The mean then dropped off slightly, to 542, for an increase of 79% during the roughly six-month follow-up period.

This pattern of an initial increase in demand followed by a drop to a plateau higher than the original level is common in mass media promotions. When postcampaign levels drop below the original level, researchers usually presume that pre-existing demand "bunched up" during the promotion period, and that no net increase in performance will occur over the long term.

The PRO-PATER Clinic

Because the PRO-PATER clinic had been in existence for longer than the other clinics and was more closely involved in the evaluation, we will analyze in depth the impact of the campaign on the São Paulo clinic only. The analysis is based on detailed time-series and source-of-referral data, which were unavailable for clinics in the Northeast.

The São Paulo clinic data cover an extended 18-month postcampaign period from July 1989 through December 1990. The data are daily averages—a more precise measure than monthly averages, because the clinic was not open for services for the same number of days each month. Table 1 presents the daily mean and the

Table 1. Indicators of clinic performance, by timing in relation to mass media campaign, PRO-PATER clinic, São Paulo, Brazil, 1989–1990

Indicators	Pre-campaign	Campaign	Post-campaign	Mini-campaign	Postmini-campaign
NUMBERS					
Telephone inquiries					
Daily mean	25.4	95.4	32.8	28.9	22.1
Period total	3,278	2,861	3,741	1,070	1,171
Clinic visits					
Daily mean	21.4	51.0	30.3	30.7	24.1
Period total	2,758	1,529	3,449	1,137	1,276
Vasectomies					
Daily mean	15.2	27.5	23.5	22.4	18.8
Period total	1,960	825	2,981	827	997
% DISTRIBUTION					
Referrals					
Television	4.5	57.9	33.8	12.2	6.1
Radio	na	5.0	2.0	1.1	0.1
Magazines/newspapers	15.3	10.0	6.2	17.1	20.3
Friends/relatives	55.0	20.2	43.3	52.7	49.1
Electronic billboard	na	na	na	0.8	0.1
Mailing list	na	na	na	na	6.3
Other	25.2	6.8	14.7	16.2	18.0
Reason for call					
To schedule appointment	92.8	62.7	52.2	47.3	27.8
For information	7.2	37.3	47.8	52.7	72.2
Total	100.0	100.0	100.0	100.0	100.0

Note: na—not applicable.

total number of telephone inquiries, clinic visits and vasectomies performed for five distinct periods—the seven months prior to the initiation of the campaign (October 18, 1988, through May 17, 1989); the six-week campaign (May 18 through June 30, 1989); the five and one-half months immediately following the campaign (July 1 through December 15, 1989); the two-month follow-up minicampaign (January 2 through March 4, 1990); and the two and one-half months immediately following it (March 5 through May 17, 1990).

The daily number of telephone calls jumped from 25 to 95 during the six-week campaign, an increase of 276%; they then fell back to an average of 33 calls per day in the five and one-half months immediately following, and gradually declined to 29 per day during the two-month minicampaign and to 22 per day in the period after the minicampaign.

Mean daily visits to the clinic increased by 138% during the campaign, from 21 to 51. Over the year after the campaign, visits declined to 30 per day, and then fell to 24 during the final period studied; this last daily average represents a net increase of 13% from the baseline level. An analysis of the ages of men who visited the clinic before, during and after the campaign showed no significant differences.

The number of vasectomies performed increased from an average of 15 per day

before the campaign to a mean of 28 per day at the conclusion of the media campaign (an 81% increase); the daily average declined to 24 in the five and one-half months immediately following the campaign and then to 22 and 19 per day, respectively, at the conclusion of the minicampaign and in the months following it. The final average was thus about 24% higher than that at baseline.

During the precampaign period, other persons were the dominant sources of referrals among clinic callers. In the seven months prior to the campaign, 55% of callers said they were referred by friends and relatives, compared with 5% by television and 15% through the print media. These percentages had shifted dramatically by the conclusion of the six-week campaign, when 58% of the sources of information cited were television spots, compared with 20% friends and relatives and 10% the print media. The proportion of radio referrals was only 5%.

In the first five and one-half months immediately following the campaign, the

*The PRO-VAS clinics that participated in the project in Fortaleza were a small freestanding one and a larger one at the Federal University in Ceará run in conjunction with the Sociedade de Assistência à Maternidade, Escola Assis Chateaubriand (SAMEAC) Institute. Since a public-sector strike during the campaign closed the university-based clinic for months, only one PRO-VAS clinic remained open during the whole campaign, and the postcampaign decline in performance is exaggerated as a result.

Table 2. Total costs (in U.S. dollars) of mass media vasectomy campaign in three Brazilian cities, by type of cost

City	Total	Fixed production	Television	Radio	Pamphlet	Magazine	Billboard	Direct mail
Total	\$172,910	\$61,103*	\$78,615	\$6,740	\$9,273	\$6,777	\$4,223	\$6,179
São Paulo	120,162	31,883	62,085	5,924	3,091	6,777	4,223	6,179
Fortaleza	23,068	14,610	5,243	124	3,091	na	na	na
Salvador	29,679	14,610	11,287	692	3,091	na	na	na

*The total fixed radio and television production costs (\$43,830) were allocated equally among all three cities. The São Paulo production costs also include fixed costs of \$17,273 for the magazine publicity, electronic billboard and direct mail.

proportions shifted again, with television representing 34% of referrals, friends and family 43%, articles or ads in the print media 6% and radio broadcasts 2%. Following the minicampaign, the proportion of referrals that were from magazines and newspapers increased to 17%, a trend that continued into the final two and one-half months, peaking at 20%. (This increase corresponds to the ad placed in *Veja* and the direct mailing to subscribers.)

The electronic billboard in downtown São Paulo was a very minor referral source, accounting for fewer than 1% of referrals at any time. The proportion of television referrals ultimately declined to its baseline level of about 6% almost a year after the 1989 campaign. The proportion of referrals from other persons also returned to a level close to its initial one (approximately 50%).

Cost-Effectiveness Analysis

Table 2 shows that television broadcast time accounted for the greatest proportion of the total cost of the campaign—\$78,615 out of the \$172,910 spent.* According to the clinic-referral data, television also had the greatest impact on clinic calls and visits. Although costs were approximately the same for the radio broadcasts, magazine ads and direct mailing, radio referrals to the clinic never exceeded 5% of referrals throughout. Thus, a combination of television and magazine or newspaper promotion appears to have produced the best results for vasectomy promotion in Brazil. But was the additional impact of television worth the higher costs?

To answer this question, we computed a simple cost-effectiveness ratio based on the total cost figure of \$172,910 and the

*To make comparisons over time more stable, all costs reported in this article are in U.S. dollars rather than in Brazilian currency, which fluctuated greatly over the period. We did not correct for inflation in the U.S. dollar, however.

†The total cost used for these calculations included only the communication and promotion costs in Brazil; the cost of the vasectomy was excluded, as were any technical assistance costs.

monthly data on mean numbers of calls, visits and vasectomies performed. The differences between the precampaign and campaign periods and between the campaign and postcampaign periods, multiplied by their respective six-week and five-and-one-half-month durations, yields a total net gain in clinic visits and calls of 3,264, and a total net gain in vasectomies of 1,854 for the period beginning May 18 and ending December 15, 1989. Dividing the total cost by each of these net increases yields cost-effectiveness ratios (which can be expressed as the cost of motivating each additional call, visit or operation) of \$53 per visit or call and \$93 per vasectomy.†

Longitudinal Analysis

An interrupted time-series analysis of monthly vasectomy data from PRO-PATER shows an immediate and sub-

stantial increase in vasectomies performed after the start of the mass media campaign. Figure 1 graphs the number of vasectomies performed each month, from January 1988 through December 1990, interrupted by the 1989 mass media campaign. As expected, vasectomy performance increased substantially immediately following the mass media campaign. (The one-month lag after the campaign began resulted from the time required to visit or call the clinic and schedule the operation.)

The number of vasectomies peaked during the month immediately after the campaign, when 689 vasectomies were performed, compared with an average of 310 operations during the period before the campaign; the monthly average after the campaign was 401 vasectomies. One-way analysis of variance revealed that this difference was statistically significant at $p < .01$.

Our analysis of the mean differences before and after the campaign does not take into account changes in the slope, however. After the dramatic increase in vasectomies, there was a gradual decline through 1990, when performance leveled off at precampaign levels. Poisson regression analysis, which takes each monthly time point into account, provides a more sensitive analysis of the data than does simple analysis of variance.¹⁴ We treated the precampaign vs. postcampaign difference as a

Figure 1. Effect of mass media campaign on number of vasectomies performed per month, and Poisson regression, PRO-PATER Clinic, São Paulo, 1988–1990

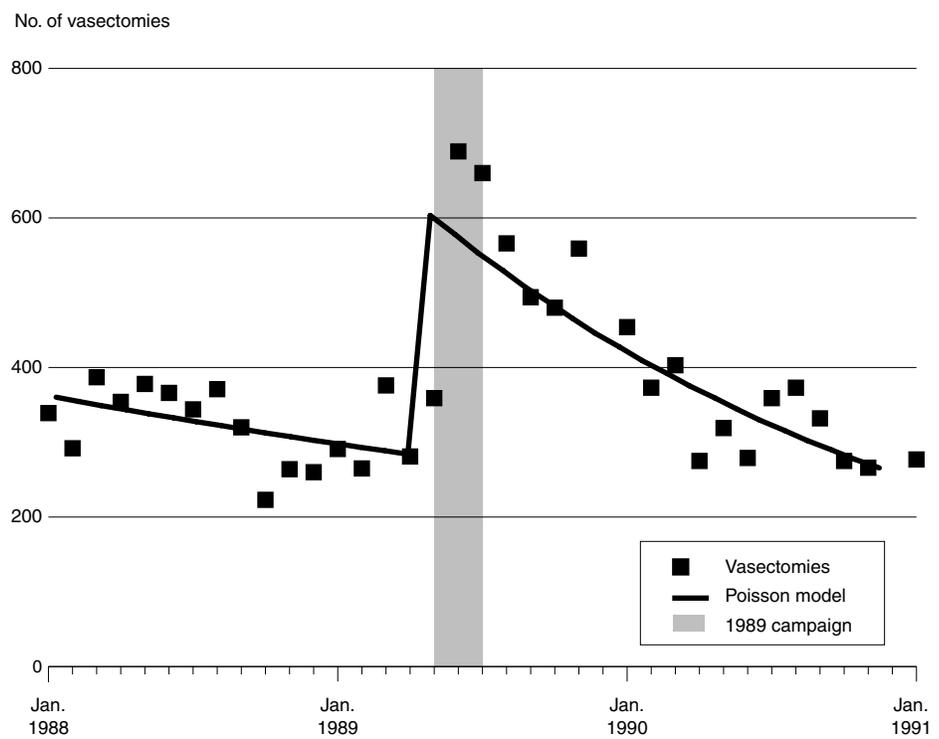
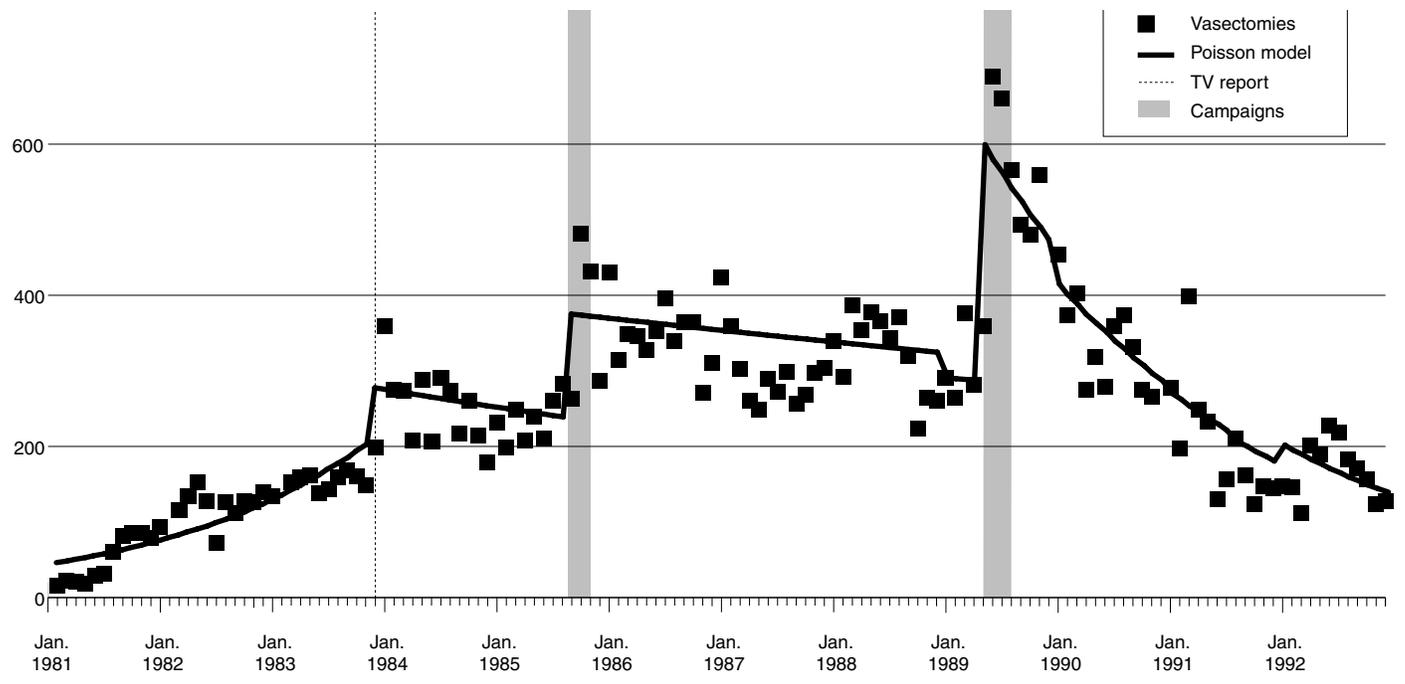


Figure 2. Effect of media events on number of vasectomies performed per month, and Poisson regression, PRO-PATER clinic, São Paulo, 1981–1992



dummy variable, and also included the time-campaign interaction in the regression. For the three years depicted in Figure 1 (1988–1990), all three variables—time, campaign and time-campaign interaction—were statistically significant at $p < .001$.*

The results of the regression analysis are indicated by the solid line in Figure 1. During this three-year period, the overall effect of time was negative, indicating a general downward trend in the number of vasectomies performed. The effect of the campaign was positive, increasing the number performed. The interaction between time and campaign was negative, however, indicating that the downward slope of vasectomy performance became significantly more negative after the communication campaign ended.

The greater negative slope after the campaign raises questions about the long-term trend in vasectomy performance at the PRO-PATER clinic. Specifically, did performance continue to decline after the 1989 mass media campaign? To answer this question, we obtained data from PRO-PATER on all vasectomies performed from the clinic's opening in February 1981 through the end of 1992. Figure 2 graphs these data relative to the timing of three mass media events undertaken over that extended period: a three-minute report about vasectomy broadcast on national television in 1983; a print-only campaign in 1985; and the multimedia campaign of 1989.

The solid line in Figure 2 shows the level

of performance predicted from the Poisson regression of the number of vasectomies on the variable time, using the three mass media events as dummy variables and their interactions with time and the cost of the operation. After a steep increase in the number of vasectomies performed in the first three years, there was an abrupt jump after the three-minute television report in 1983, followed by a gradual decline. The first mass media promotion in 1985 also produced a significant jump in clinic performance, followed by another gradual decline.

The results of this second regression analysis are presented in Table 3 (page 174). All variables were statistically significant except for the interaction between time and the 1985 print campaign. The regression indicates that time had a statistically significant, positive effect over the entire 12-year period, even after the effects of the other variables in the model were controlled for.[†] All three media events—1983, 1985 and 1989—had positive, statistically significant effects and, as expected, cost had a statistically significant negative effect.

The interaction between time and the initiation of the 1989 campaign was statistically significant and negative, indicating that after the multimedia campaign ended, the downward slope decreased further, to a significantly lower negative value. This change is readily apparent in Figure 2. The solid line that fits the data between 1985 and 1989 slopes downward,

but is much less steep than the slope occurring after the 1989 campaign.

The trend between the 1985 and 1989 media campaigns is also negative, but not significantly different from the slope before the 1985 print campaign. Although the 1985 campaign increased the number of procedures performed, the same downward trend continued until the multimedia campaign of 1989. After this last campaign, the downward trend in performance became even more pronounced.

Once the data are extended to the three years beyond the 1989 campaign, the negative slope in performance after the 1989 campaign is even more dramatic. By 1992, vasectomies had dropped to the level recorded 10 years earlier. The simple correlation between time and the number of vasectomies before the 1989 campaign was 0.81 and positive; after the campaign, the correlation (-0.82) was exactly reversed. Thus, in a broader historical context, the 1989 campaign appears to have only temporarily reversed a long-term downward trend in the number of vasectomies provided by PRO-PATER clinic.

Several hypotheses may explain this long-term downward trend. The first is financial.

*The overall regression model was also statistically significant at $p < .001$ ($\chi^2=644.1$, $df=3$, $N=37$), and it explained approximately 46% of the variance in clinic performance.

†The overall model was statistically significant at $p < .001$ ($\chi^2=8071.4$, $df=8$, $N=143$). The model explained 75% of the variance in clinic performance from its beginning in 1981 to December 1992.

Table 3. Poisson regression coefficient (and 95% confidence interval) for number of vasectomies performed per month, by time, communication and cost variables

Variable	Coeff.	t value	p
Time	0.045 (0.041, 0.048)	24.334	.001
TV (1983)	2.149 (1.922, 2.376)	18.587	.001
Time-TV interaction (1983)	-0.052 (-0.058, -0.047)	-17.696	.001
1985 Campaign	0.244 (0.010, 0.477)	2.046	.041
Time-campaign interaction (1985)	0.004 (-0.001, 0.009)	1.558	.119
1989 campaign	3.755 (3.557, 3.954)	37.022	.001
Time-campaign interaction (1989)	-0.030 (-0.032, -0.028)	-30.198	.001
Cost	-0.002 (-0.003, -0.002)	-6.700	.001
Constant	3.827 (3.730, 3.924)	77.303	.001

Notes: No. of observations=143 months; χ^2 (df=8) at 8071.438; probability=0.000; and pseudo $R^2=0.7468$.

As external funding declined and the cost of supplies increased, PRO-PATER had to charge clients more. This price factor was exacerbated by a general increase in the cost of living in Brazil after 1989, including a major devaluation in the nation's currency.

Another hypothesis concerns an increase in competition from new providers of vasectomy services. These probably included some of the 44 physicians in the São Paulo area who were trained by PRO-PATER. The organization's promotional efforts, especially the 1989 television campaign, most likely stimulated attendance at other São Paulo providers.

Although no provider data are available to test the alternative provider hypothesis, we were able to investigate the cost increase hypothesis using price quotes from PRO-PATER for January 1987 through December 1992. From January 1987 through December 1988, a vasectomy cost \$62, and in January 1989 it increased to \$110; the price rose again in January 1990, to \$155 then again in January 1991, to \$165, and finally peaked in August 1991, at \$181. In January 1992, the price dropped to approximately \$117.

We included this cost factor in the Poisson regression analysis. The small downward shifts in the solid line representing the numbers of vasectomies predicted from the regression model (Figure 2) occur whenever the cost of the operation changed. In fact, the increasing costs of vasectomy had a statistically significant negative (downward) effect on the number of vasectomies performed (Table 3).

Discussion and Conclusions

The quasi-experimental research design used in this evaluation (comparing pretest and posttest measures among one sample of men) was insufficient to determine whether the mass media campaign caused the increase in calls and visits and in vasectomies; the only way to rule out the possibility that other factors caused the

effect, since it occurred immediately after the campaign began and no other known events or circumstances were observed.

The longitudinal analysis of PRO-PATER clinic data reveals that all three mass media events had a significant impact on the number of vasectomies performed, and that the greatest impact resulted from the multimedia campaign of 1989, which used prime-time television and radio spots. Data on clinic referral sources indicate that television played an important role in motivating men to visit the clinics.

The effect of the television campaign, which received international awards for its creative merit, was clear in its impact on clinic inquiries, visits and operations performed. Furthermore, evidence exists, especially for the São Paulo clinic, that the mass media campaign had a significant effect on clinic performance.

The long-term analysis, however, implies that some kind of ongoing promotion is necessary to maintain a given level of clinic activity or to raise activity to a new level. The PRO-PATER experience suggests that without periodic mass media promotions, clinic performance will gradually decline over the long term. A well-designed mass media campaign can increase clinic performance even during a period of relative decline, and even when costs to clients are rising.

The simple cost-effectiveness analysis reveals that the promotional cost of \$93 per additional client is about the same as the cost of the vasectomy itself. While the cost-effectiveness ratio may seem high at first, it should be considered within a historical and cultural context, since vasectomy has traditionally been a difficult method to promote in Latin cultures. The near-doubling in price of the procedure in the first months of 1989 also affected the ratio. For example, in January 1989, the cost of a vasectomy at PRO-PATER increased from nearly \$62 to about \$110,

changes is to use a control group for comparison. However, the pattern of change in the predominant referral source from interpersonal sources to television, and then back again once the campaign ended, increases our confidence in a causal inference. Causation is also supported by the timing of the ef-

where it remained during the campaign.

Taking the method's effectiveness into account further reduces the apparent size of the promotional costs. For example, because a vasectomy provides an average of 10 couple-years of protection against pregnancy,¹⁵ the promotion cost per couple-year of protection is \$9.30. Moreover, given the relative difficulty of motivating Brazilian men to adopt vasectomy (compared with that of motivating Brazilian women to begin using the pill, for example), the cost seems reasonable. Although it is often easier for potential acceptors to adopt temporary methods, such as the pill, it is also easier to discontinue use, and pill discontinuation rates can run as high as 50% within one year of use in developing countries.¹⁶

In most communication cost-effectiveness analyses, estimating long-term effects is difficult because of research costs and time constraints. In our research, where we examined long-term vasectomy data, the regression analysis confirms the significant, positive effect of three media interventions on clinic performance. Unfortunately, the long-term effects appear to have ultimately been offset by concomitant increases in costs and by the presence of alternative sources for the operation.

The effectiveness estimates also do not reflect the expected diffusion effect—that is, an increase in word-of-mouth promotion by the rising number of new vasectomy clients and future potential clients. Since the current number of vasectomized men is still low in Brazil, such men probably do not yet constitute the critical mass needed to accelerate the procedure's diffusion. Some type of future mass media promotion is thus still necessary; the long-term trend of PRO-PATER clinic performance suggests that such regular, periodic mass media promotions could maintain or increase the prevalence of vasectomy.

Mass media promotions and discussions of vasectomy should be continued at a level and a frequency sufficient to maintain public interest. One possibility is to inaugurate an annual "Vasectomy Week" promotion, followed by a weekend of inexpensive, prime-time promotional spots every three months. Perhaps then the growth in the number of vasectomy acceptors will produce the critical mass of satisfied users needed to multiply the effects of mass media promotional efforts by means of personal advocacy.

References

1. L. Liskin, E. Benoit and R. Blackburn, "Vasectomy: New Opportunities," *Population Reports*, Series D, No. 5 1992.
2. B. Xu, "Male Sterilization in China," *British Journal of*

Family Planning, 19:243–245, 1993.

3. *Ibid.*

4. J. Zhang, "A Good Example: Sichuan Province," *Integration*, No. 39, 1994, p. 19.

5. "Involving Male Participation," *People and Development Challenges*, Vol. 2, No. 3, 1995, p. 7.

6. K. Kiragu et al., "The Vasectomy Promotion Project (Kenya): Evaluation Results," Johns Hopkins University Population Communication Project Working Paper, Baltimore, Md., USA, 1995.

7. J. T. Bertrand et al., "Evaluation of a Communications Program to Increase Adoption of Vasectomy in Guatemala," *Studies in Family Planning*, 18:361–370, 1987.

8. R. Vernon, G. Ojeda and A. Vega, "Making Vasectomy Services More Acceptable to Men," *International Family Planning Perspectives*, 17:55–60, 1991.

9. J. M. Arruda et al., *Pesquisa Nacional Sobre Saúde Materno-Infantil e Planejamento Familiar—1986*, Sociedade Civil Bem-Estar no Brasil, Rio de Janeiro, and Institute for Resource Development/Westinghouse, Columbia, Md., USA, 1987.

10. M. P. P. de Castro et al., "An Innovative Vasectomy Program in São Paulo, Brazil," *International Family Planning Perspectives*, 10:125–130, 1984.

11. K. G. Foreit, M. P. P. de Castro and E. F. Franco Duarte, "The Impact of Mass Media Advertising on a Voluntary Sterilization Program in Brazil," *Studies in Family Planning*, 20:107–116, 1989.

12. United Nations Department of Public Information, *World Media Handbook*, New York, 1990.

13. E. da Rocha Lordêlo and L. Morris, *Conhecimentos e Atitudes em Relação à Vasectomia Entre Homens de Salvador—1989*, Fundação de Apoio à Pesquisa e Extensão, Salvador, Brazil, Mar. 1991; C. P. M. Sakamoto, H. S. Freire and L. Morris, *O Homen e a Vasectomia na Cidade de São Paulo: Um Estudo de Conhecimento, Atitudes, e Comportamento—Fase II, 1989*, Centro Materno Infantil de Planejamento Familiar,

São Paulo, Brazil, Aug. 1991; and Promoção da Paternidade Responsável (PRO-PATER), *Vasectomia: Faça por Amor*, Johns Hopkins University Population Communication Services, Baltimore, Md., USA, 1990.

14. P. McCullagh and J. A. Nelder, *Generalized Linear Models*, Chapman and Hall, New York, 1989.

15. J. T. Bertrand, R. J. Mangnani and J. C. Knowles, *Handbook of Indicators for Family Planning Program Evaluation*, Carolina Population Center, The Evaluation Project, Chapel Hill, N. C., USA, 1994, p. 149.

16. A. Larson, S. Islam and S. N. Mitra, *Pill Use in Bangladesh: Compliance, Continuation and Unintentional Pregnancies. Report of the 1990 Pill Use Study*, Mitra and Associates, Dhaka, Bangladesh, 1991; and A. E. Perez and T. L. Tabije, *Contraceptive Discontinuation, Failure, and Switching Behavior in the Philippines*, DHS Working Paper, No. 18, Macro International, Calverton, Md., USA, 1996.

Resumen

Una campaña de difusión en los medios masivos para promover la vasectomía en tres ciudades brasileñas (São Paulo, Fortaleza y Salvador) utilizó anuncios de radio y televisión en las horas de mayor audiencia, panfletos, un letrero luminoso y actividades de relaciones públicas. Los datos de las clínicas de vasectomía indican que el promedio mensual de vasectomías aumentó en un 108% en Fortaleza, en 59% en Salvador y en 82% en São Paulo. Un análisis minucioso de los datos de la clínica en São Paulo muestran que durante la campaña, la televisión reemplazó la referencia personal como la principal fuente de información sobre vasectomía entre aquellos que llamaron a la clínica. Un análisis de regresión basado en los registros de la clínica de São Paulo corres-

pondientes a 12 años confirmó que las promociones periódicas en los medios masivos ayudaron a retrasar la tendencia general de la disminución del número de vasectomías pero no podían pararla. Los aumentos en el costo de esta intervención y la disponibilidad de fuentes alternativas de servicios de vasectomía contribuyeron al descenso en el número de operaciones efectuadas.

Résumé

Une campagne médiatique de promotion de la vasectomie dans trois villes brésiliennes (São Paulo, Fortaleza et Salvador) a été organisée sous la forme de messages radio et télédiffusés aux heures de grande écoute, distribution de pamphlets, tableau d'affichage électronique et activités de relations publiques. Selon les données cliniques, le nombre moyen mensuel de vasectomies a augmenté de 108% à Fortaleza, de 59% à Salvador et de 82% à São Paulo. Pendant la durée de la campagne, la télévision a remplacé les sources personnelles en tant que source prédominante de recommandation des hommes s'étant adressés, par téléphone, aux cliniques. Une analyse de régression basée sur les dossiers cliniques de 12 années de São Paulo a confirmé que les promotions médiatiques périodiques ont atténué la tendance générale à la baisse enregistrée dans les cliniques avec le temps, sans pouvoir l'arrêter. Les augmentations dans le coût de la vasectomie et dans le nombre d'autres sources de l'opération ont contribué à la baisse de clientèle.