

A Quasi-Experimental Study to Assess the Performance of a Reproductive Health Franchise in Nepal

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THIS PUBLICATION FINANCED BY USAID



This publication was made possible through support provided by the Bureau of Global Health, Office of Population and Reproductive Health, United States Agency for International Development (USAID) under the terms of Contract No. HRN-C-00-98-00039-00. The views and opinions of authors expressed herein do not necessarily state or reflect those of USAID or the US Government.

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ACKNOWLEDGMENTS

The authors would like to thank local program implementation partners Dr. Mahendra Shrestha, of the Nepal Fertility Center, and Ranjeet Acharya, of Prisma Advertising, as well as survey fieldwork team leaders Anand Tamang and Dr. Davendra Shrestha, of the Center for Research on Environment, Health, and Population Activities. Thanks also are due CMS Research Director Ruth Berg, for help with conceptualizing the study and reviewing the report.

ABSTRACT

In 2001 the Commercial Market Strategies (CMS) project established a nurse and paramedic franchise in Nepal to increase utilization of reproductive health services and client satisfaction with service quality. To assess the impact of the intervention, CMS used a quasi-experimental study design, with baseline and follow-up measurements on non-equivalent control groups. Three instruments were administered to study participants: client exit interviews, provider interviews, and household interviews. Baseline surveys were conducted during April and May 2001. Follow-up surveys were conducted during December 2002 and January 2003. Multi-level random-effect models were used to estimate clinic/cluster-level variances. Civil unrest in Nepal caused major delays in project implementation: The evaluation presented in this report covers about 10 months of actual implementation.

CMS found that at the clinic level, client satisfaction increased at intervention clinics, but not at control clinics. Client loyalty, measured by return visits, also increased at intervention clinics, but not at control clinics. The increase in client loyalty was explained, in part, by the increase in satisfaction with service quality. At the population level, CMS did not find consistent increases in utilization of various reproductive health services, possibly because (1) providers were not proactive in informing clients who came for general health services about the reproductive health services being offered; (2) mass media activities had limited impact on increasing awareness of reproductive health services being provided by the nurse and paramedic franchise; and (3) the intervention was implemented for too short a period of time for it to have had a measurable impact. While utilization of other reproductive health services did not change, an increase in contraceptive use may have been associated with use of the nurse and paramedic network.

CMS concluded that a franchiser that provides training to franchised clinics in reproductive health service delivery and in client-provider interaction and that monitors the quality of care provided at these clinics can help increase client satisfaction at network clinics. The data do not reveal how utilization of reproductive health services could be increased at franchised clinics.

KEY WORDS

Franchise, networks, private sector, quality, service delivery, reproductive health program evaluation, family planning/reproductive health operations research.

RECOMMENDED CITATION

Agha, S; A M Karim; A Balal; and S Sossler. 2003. *A Quasi-Experimental Study to Assess the Performance of a Reproductive Health Franchise in Nepal*. Washington, DC: USAID/Commercial Market Strategies Project.

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COUNTRY RESEARCH SERIES NUMBER 14

September 2003

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1 Introduction

INTRODUCTION

In recent years, there has been substantial growth of the private health sector in developing countries. Since many governments have been unable to maintain health expenditures at past levels, they have deliberately promoted the involvement of the private sector in health care (Kumaranayake et al., 2000). However, regulations regarding the operation of private health providers have not kept pace with the expansion of this sector. This has led to concerns about the inability of outdated government regulations to address potential opportunistic behavior by private providers, leading to variations in the price and quality of services (Hongoro and Kumaranayake, 2000). For example, low-quality treatment of tuberculosis and sexually transmitted infections (STIs) by private-sector providers may have contributed to antibiotic resistance in developing countries (Brugha and Zwi, 1999; Mills et al., 2002).

Nevertheless, much of the existing regulation of health-sector quality and price in developing countries occurs through legislation, even though its effectiveness in regulating the quality of services offered by the private sector remains unknown (Kumaranayake et al., 2000). An alternative approach to improving the quality of services offered by private providers is to create incentives for changing their practices and to train providers in improving quality of care and marketing services to clients (Agha et al., 1997; Foreit, 1998). Better marketing of higher-quality services can be expected to lead to greater utilization of reproductive health services. Franchising is one mechanism for changing provider behavior that may lead to increased utilization of better-quality private-sector services (Montagu, 2002).

This study examined the performance of a nurse and paramedic network that was established to increase the quality and utilization of reproductive health care services in a district in Nepal. We assessed the extent to which there were improvements in client perceptions of the quality of care and an increase in the utilization of reproductive health services offered by network clinics.

2 Background

BACKGROUND

In recent years, there has been considerable interest in franchising reproductive health services in developing countries. This service delivery model creates a network from existing providers to deliver a specific set of services under an umbrella brand that signifies quality. A controlling organization (franchiser) can revoke a participating provider's (franchisee's) right to offer the specific services provided by the franchise (Commercial Market Strategies Project, 2002).

In order for the franchiser to have control over the quality of services provided, it is important that the provider sees the value of belonging to the network. The primary motivators for providers to join the network are a more loyal clientele and increased profits resulting from higher client volume, as more clients seek better-quality services. The motivators for providers to *remain* part of the network are brand recognition of the franchise among potential customers and an increase in client volume.

The incentives offered to the provider need not be solely financial. Many providers place value on post-medical education (for example, learning new medical techniques) and the opportunity to interact with other providers (Montagu, 2002).

The franchiser increases the demand for new services by marketing them through outreach activities (for example, advertising and promotion) and training the provider to market the services directly to potential clients. The provider should also inform current clients of new services being offered to promote interest in receiving the services (Foreit, 1998). This focus on the critical role of providers in demand creation falls under a "services marketing" approach, which emphasizes the provider-client relationship as an explicit part of the marketing mix. By providing good-quality services and building trusting and caring relationships with clients, providers can both attract new clients and build loyalty among existing clients, while increasing reproductive health service utilization (Foreit, 1998) and their profits.

3 The Intervention

THE INTERVENTION

Most private physicians in Nepal have their practices in and around Kathmandu Valley. In order to expand access to reproductive health services in districts outside Kathmandu, providers such as nurses and paramedics need to be involved. Overall, there are an estimated 12,000 trained nurses and paramedics in Nepal (Jha, 2000); a large number of them have private clinics in addition to their public-sector jobs. The services provided at nurse and paramedic clinics primarily include general medical consultation, treatment for minor illnesses, and sale of medicines — although family planning services (except for intrauterine devices, or IUDs, and sterilization) and a limited set of reproductive health services are also provided at most such clinics.

A pilot “fractional franchise” network of 64 nurses and paramedics in the Rupandehi district was developed to provide good-quality reproductive health services. A fractional franchise is an arrangement where an additional package of services, offered under franchiser guidelines (Montagu, 2002), is added to an existing practice. The decision to launch a franchise network was based on several important considerations: the need for a contractual arrangement to facilitate ongoing quality monitoring at the nurse and paramedic clinics; the considerable economies of scale in training and promotion for a network compared to individual providers; and the potential of a network brand to promote high-quality family planning and reproductive health services and attract new clients to network clinics. In addition, nurses and paramedics had expressed a desire to work within a larger provider community. *Sewa* was the brand name chosen for the network; it means “service” in Nepali.

Provider recruitment: There are about 400 trained nurses and paramedics in Rupandehi, and 190 have private clinics. (Nurses and paramedics in Nepal go through training that ranges from 10 months to 3 years.) *Sewa* recruited 64 providers based on presence of a physical facility and a reasonable client volume; level of interest in the network; clinic location; existing service mix; and willingness to comply with monitoring protocols. The types of providers are staff nurse, health assistant, auxiliary nurse midwife, auxiliary health worker, and community medical assistant.

Membership contract: The membership contract between the Nepal Fertility Care Center (NFCC) as franchiser and individual nurse and paramedic providers as franchisees specifies the roles and responsibilities of each party. The fertility center is responsible for providing training, quality monitoring, and marketing support and for establishing a referral system. In return, the providers agree to pay membership fees, offer family planning and reproductive health services, follow quality protocols, adhere to an agreed-upon fee schedule, and maintain service statistics. *Sewa* network providers pay a one-time registration fee of \$1.40 and an annual membership fee of \$9.00 (paid in monthly installments).

Training: All network members received 7 days of training in reproductive health, including family planning. A subset of female nurses and midwives also had 21 days of IUD training. Training materials were adapted from existing curricula developed by Engender Health and the Johns Hopkins Program for International Education in Reproductive Health. Major topics included the following:

- **Infection prevention** — decontamination procedures, waste disposal, proper hand washing, and use of sterilized gloves
- **Availability of essential equipment** — emergency supplies, autoclave, reproductive health manual, weighing scale, examination table, and IUD kit
- **Provision of temporary contraceptive methods (except IUD)** — information about all contraceptive methods, along with referrals for IUD and permanent methods, counseling techniques, screening, management of side effects, and infection prevention
- **Reproductive health** — antenatal care, including identification of high-risk pregnancy (blood pressure, urine sugar/albumin, weight, anemia assessment) and high-risk pregnancy referral; tetanus toxoid immunization; nutritional counseling and iron supplements; antenatal family planning counseling and referral for safe delivery; post-natal care (including breastfeeding); and management and referral for common gynecological problems (such as vaginal discharge, menstruation problems, and pelvic inflammation)

- **STIs** — identification of symptoms, syndromic management, individual and couple counseling, and counseling for AIDS prevention

Franchisees also attended a two-day module on service marketing, comprising lectures, simulation activities, and group exercises. The module's main objective was to highlight the significance of interactive marketing with its focus on client-provider interaction and implications for client satisfaction and loyalty. Baseline findings showed that attributes such as caring and reliability are important determinants when clients choose a provider. Moreover, a review of the service marketing literature suggests that additional dimensions such as empathy, trust, and bonding contribute to positive client-provider interaction and retention of satisfied clients. In addition to interactive marketing, the module also introduced providers to various network-external marketing activities and identified opportunities for participation.

Marketing and promotion: The intervention supported network members with a broad range of marketing activities, including adding network signboards to the front of participating clinics and supplying all network providers with white coats/blouses printed with the network logo. Other marketing activities designed to create awareness of network services included radio and print advertisements, brochures and leaflets, door-to-door campaigns, billboards (known as hoarding boards in Nepal), clinic open houses, and promotional booths in local farmers' markets. A monthly member newsletter reported network activities and reinforced network affiliation.

Although baseline research findings were used to develop mass media messages, the intervention's limited marketing budget did not allow for conducting extensive formative research or for monitoring the effectiveness of media activities. And, while radio messages included quality cues such as friendly and caring providers of reproductive health services, they did little to reinforce brand recognition.

Referral linkages: The intervention established two types of referral linkages: An internal referral system has allowed providers to refer clients to trained female providers for IUD services, and external linkages have been established with private physicians and district government health facilities that allow referral of more complicated health problems.

Quality monitoring: Each month the franchiser sent a field coordinator to all network clinics to monitor quality of care. The main purpose of these visits was to ensure that service quality protocols (as explained in initial training sessions for network providers) were being followed. The field coordinator observed service delivery at the clinic and administered a detailed quality checklist that included infection prevention, availability of essential supplies and equipment, and client-provider interaction. In addition, the field coordinator reinforced the training module's interactive marketing strategies for client-provider interaction. If the field coordinator deemed it necessary, she also talked to clients to assess whether the provider had complied with quality protocols. She then shared the results with the service provider and suggested relevant corrective actions.

Monitoring and evaluation: Program monitoring relied on monthly visits by the field coordinator to review service statistics. In addition, a mid-term assessment was prepared using client exit and "mystery client" surveys. The formal evaluation specified before the program started is discussed in more detail in a subsequent section of this report.

Implementation time frame: Although provider recruitment began in February 2001, it took a year before all network components were operational. Most marketing activities (including mass media advertising and outreach) began in February 2002. Nepal's political and civil unrest contributed significantly to these delays; because security issues restricted the mobility of trainers and other field staff for prolonged periods of time, training and promotional activities were routinely interrupted.

4 Method

METHOD

STUDY DESIGN

Each month, CMS used a quasi-experimental design with baseline and follow-up measurements on non-equivalent control groups to assess the impact of the intervention on client satisfaction with quality of care and client service utilization reports. Although this design is less robust in terms of threats to validity than a true experimental design (Fisher et al., 1998), it is more practical in many field settings (Jemmott and Jemmott, 1994; Fisher et al., 1998). Use of a non-equivalent control group is particularly appropriate when an intervention is introduced in one district and the comparison of program effects is made against a neighboring district that is similar, but not necessarily equivalent. It is also appropriate when training is given to one group of health providers and results are compared to a similar group that did not receive the training (Fisher et al., 1991). The quasi-experimental design has therefore been useful in this study, since individuals visiting one set of providers are compared to individuals visiting a similar set of providers, and individuals in one district who are exposed to an intervention are compared to similar individuals in a neighboring district who serve as controls.

The intervention was implemented in Nepal's Rupandehi district. The district has a population of 708,419; a literacy rate of 42 percent; and a per capita income of \$125 (Central Bureau of Statistics, 2001). The control district, Nawalparasi, is adjacent to Rupandehi and is fairly similar, with a population of 562,870; a literacy rate of 38 percent; and a per capita income of \$99. The contraceptive prevalence rate is 36 percent in Rupandehi and 42 percent in Nawalparasi (United Nations Development Programme, 1998).

INSTRUMENTS

Three instruments were used for this study: client exit interviews, provider interviews, and household interviews. The exit survey instrument was used to collect information on client visits to nurse and paramedic clinics in the *Sewa* network. Client exit surveys are increasingly being used to monitor quality of care (Williams et al., 2000) and to provide results

that are consistent with observations of client-provider interactions (Bessinger and Bertrand, 2001). Client exit surveys are therefore the most appropriate instrument for a program that focuses on improving provider interpersonal skills in order to increase client satisfaction (Bessinger and Bertrand, 2001). The exit survey instrument used in this study included questions on client satisfaction, use of specific reproductive health services from the clinic, fees paid for services, awareness of the *Sewa* network, and the socio-demographic characteristics of clinic clients. The provider instrument also collected information on types of services provided, days and hours of clinic operation, fees charged, and estimated number of clients. The household survey instrument was used to collect population-level data on the utilization and sources of reproductive health services, reproductive health care-seeking behavior, awareness of the *Sewa* network, and the socio-demographic characteristics of respondents.

DATA COLLECTION

Baseline surveys were conducted during April and May of 2001. Follow-up surveys were conducted during December 2002 and January 2003. Both sets of surveys were conducted by the Center for Research on Environment, Health, and Population Activities, a research firm based in Nepal.

A 10-day training session for fieldworkers was conducted prior to baseline data collection (which included pretesting and finalizing the instruments). An intensive 5-day training session was conducted prior to follow-up data collection. All interviews were conducted by female fieldworkers.

In the intervention district, the baseline provider survey gathered information from 35 out of 70 providers (or 50 percent) who were initially expected to be part of the network. The follow-up provider survey gathered information from 32 out of 64 providers (again, 50 percent) who actually became part of the network. Providers were randomly selected within strata determined by geographic location and provider qualification (staff nurse, health assistant, auxiliary nurse midwife, auxiliary health worker, and community medical assistant). An identical number of providers (35 at baseline and 32 at follow-up) were interviewed in the control district. Since a list of providers was not available for the control district as a

whole, a more limited list was created. The list was based on all nurses and paramedics practicing in locations selected after geographic stratification. Providers were then randomly selected within provider-qualification strata.

For the client exit surveys in each district, 24 out of 35 providers (70 percent) at baseline and 22 out of 32 providers (70 percent) at follow-up were randomly selected from the list of nurses and paramedics who had been selected for the provider survey. Field-workers interviewed clients as they left the clinics, irrespective of age or sex, over a two-day period. About 70 percent of clients who visited clinics during the period of the exit survey were interviewed — clients who did not have time for an interview because of other appointments were not interviewed. The socio-demographic characteristics of respondents at intervention and control clinics are shown in Table A1. A little more than half of the respondents to client exit surveys were female; about 8 out of 10 were married; and fewer than 1 in 3 had never attended school. The mean age of exiting clients was 33.

To our knowledge, no census of facilities had been conducted in the study's intervention and control districts that would help determine the total number of nurse and paramedic clinics. Hence, no weights were attached to the provider or client exit surveys.

For the household survey, a multi-stage sampling design was used, with 480 households selected in both the intervention and control districts. Households were selected through systematic random sampling at baseline, with married women ages 15 to 45 interviewed. In the intervention district, nine Village Development Committees (VDCs) and four urban municipality wards were randomly selected. A similar procedure was adopted in the control district, with nine VDCs randomly selected. There were, however, only two urban municipality wards in the control district; both were selected. In urban areas, voters' lists, maintained by municipal ward chairmen, were used for household listing. In rural areas, households were listed with the help of local ward representatives. With one difference, the same sample selection procedure was used at follow-up: One VDC in both the intervention and control districts was not accessible because of political unrest and had to be replaced.

The socio-demographic characteristics of women interviewed in the household surveys in the interven-

tion and control districts are shown in Table A2. Respondents' mean age was about 29 years old. Women in the control district had lower levels of education than women in the intervention district: More than half of the women in the control district had never attended school, compared with 4 out of 10 in the intervention district.

DATA ANALYSIS

The outcome variables used in this analysis were mostly dichotomous. The only continuous outcome variable used was a scale variable (labeled "Number of very satisfied responses" in Tables 1 and 2). The appropriate method for estimating the impact of the intervention on a binary outcome variable is the logit model and for a continuous outcome variable, the ordinary least squares (OLS) method. The impact of the intervention after controlling for background characteristics (for example, age, sex, education level, and marital status) of the respondents can be obtained using the following equations (1) and (2) for the logit and OLS models, respectively:

$$\ln\left(\frac{P}{1-P}\right) = \beta_0 + \beta_1 T + \beta_2 G + \beta_3 T \times G + \beta_4 C + \varepsilon \quad (1)$$

$$Y = \beta_0 + \beta_1 T + \beta_2 G + \beta_3 T \times G + \beta_4 C + \varepsilon \quad (2)$$

In these equations, P is the probability of a confirmatory reply on the outcome variable, and Y is the mean value of the number of "very satisfied" responses. The symbols T , G , C , and ε , respectively, represent trend (follow-up versus baseline); group (intervention versus control); control (age, sex, education level, marital status, etc.); and the error terms. Either the logit or the OLS model would estimate the coefficients β_0 (intercept), β_1 (trend effect), β_2 (group effect), β_3 (intervention impact), and β_4 (control variable effect).

However, the above-proposed methods did not account for the cluster sampling nature of the exit interview and household survey respondents: The response to a particular outcome is likely to be similar among respondents who are interviewed from a given clinic (in the exit interview) or a cluster (in the household survey) due to unmeasured clinic/cluster-level contextual factors. If the response to a particular outcome among the respondents within the clinics/clusters was significantly correlated, then even though the coefficient/parameter estimates from

equations (1) and (2) would be unbiased, the equations would provide a biased hypothesis test (Angeles and Mroz, 2001; Brown et al., 2002; StataCorp, 2001). The appropriate models that account for clinic/cluster-level correlated responses can be specified using the following equations (3) and (4) for the binary- and continuous-outcome variables, respectively:

$$\ln\left(\frac{P_{ij}}{1-P_{ij}}\right) = \beta_0 + \beta_1 T_{ij} + \beta_2 G_{ij} + \beta_3 T_{ij} \times G_{ij} + \beta_4 C_{ij} + u_i + \varepsilon_{ij} \quad (3)$$

$$Y_{ij} = \beta_0 + \beta_1 T_{ij} + \beta_2 G_{ij} + \beta_3 T_{ij} \times G_{ij} + \beta_4 C_{ij} + u_i + \varepsilon_{ij} \quad (4)$$

In these equations, P_{ij} is the probability of a confirmatory reply on the outcome variable for individual i from clinic/cluster j ; Y_{ij} is the mean value of the number of "very satisfied" responses for individual i from clinic j ; u_i is the clinic/cluster-level random effect (variance); and ε_{ij} is the individual-level error term. Two approaches were considered to estimate the multi-level equations (3) and (4). One approach was to use a robust method called Eicker-Huber-White, and the other, to use multi-level random-effect models. The major advantage of the Eicker-Huber-White procedure is that few, if any, assumptions regarding the population distribution are required. The drawback of the robust procedure, however, is that it is not efficient¹ and fails to estimate the clinic/cluster-level correlation accurately (Brown et al., 2002; StataCorp, 2001).

The multi-level random-effect models can efficiently estimate the clinic/cluster-level variances u_i (the random parameters) and the coefficients β_0 , β_1 , β_2 , β_3 , and β_4 (the fixed parameters) of equations (3) and (4). The multi-level random-effect logit model was estimated using Gauss-Hermite (GH) quadrature approximation, and the multi-level random-effect model for the continuous outcome was estimated using the generalized least squares (GLS) method. For the GH method, the clinic/cluster-level correlation (ρ or rho) was estimated using the formula $\rho = u_i / (u_i + 1)$, and for the GLS method, rho was estimated using the formula $\rho = u_i / (u_i + \varepsilon_{ij})$. The significance level (at $p < .05$) of rho was determined using chi-square statistics (StataCorp, 2001). If rho was not significant, then the simple logit or the OLS model was adequate to obtain the most efficient and unbiased coefficient and variance estimates.

The major assumption of the random-effect model is that the random-effect (u_i) is independently normally distributed. Therefore, the disadvantage of the random-effect models is that if the random-effect assumption fails to hold, it provides inconsistent (wrong) coefficient and variance estimates. One way to test the independence of the random effect is to use Hausman's specification test (Hausman, 1978). A non-significant (at $p > .05$) Hausman's test indicated that the assumption of the random effect was appropriate (StataCorp, 2001; Hausman, 1978).

Therefore, the steps for identifying the best-fit model for a particular outcome are first to estimate the multi-level random-effect model and then test the random-effect assumption using Hausman's specification test. If Hausman's test indicated that the random-effect assumption was adequate and that rho was significant (at $p < .05$), then the multi-level random-effect model was identified as the best fit. If, however, the random-effect assumption was adequate, but rho was not significant, then the ordinary logit or OLS was identified as the best-fit model. Finally, if the random-effect assumption did not hold, then the cluster/clinic-level correlation was adjusted using Eicker-Huber-White's robust method of variance estimation.

These best-fit models were used for all hypotheses tested. The p -values of the tests were reported, along with the adjusted probabilities for each outcome in the intervention and control areas during baseline and follow-up. The clinic/cluster-level correlations were also reported when the random-effect assumption was appropriate.

1 The Eicker-Huber-White method is conservative. It produces upward biased variance estimates and decreases the statistical power of the hypothesis tests (StataCorp, 2001).

5 Results

RESULTS

QUALITY OF CARE AND CLIENT LOYALTY

Table 1 shows adjusted percentages of clinic clients who report being “very satisfied” with different elements of service quality. There was an increase in the percentage of clients at intervention clinics who reported being “very satisfied” with cleanliness, from 37 to 65 percent ($p < .001$). There was no significant change in this indicator at control clinics — 17 percent at baseline and 20 percent at follow-up. The p -value indicating that trends on this indicator at intervention and control clinics are different was marginally significant ($p = 0.060$). The percentage of clients who reported being “very satisfied” with the availability of essential equipment increased from 35 to 62 percent at intervention clinics, while there was no significant change among clients at control clinics. The trends on this indicator at intervention and control clinics were significantly different ($p = 0.002$).

There was no change in the percentage of clients who reported an increase in satisfaction with the supply of essential medicine at either intervention or control clinics. Nor did clients at intervention or control clinics report higher satisfaction with client handling or with service charges. Client satisfaction with the physical look of the clinic increased from 26 to 64 percent at intervention clinics, while there was no significant change at control clinics. Similarly, satisfaction with the range of services offered increased from 40 to 71 percent at intervention clinics, while there was no significant change at control clinics. Clients at intervention clinics also reported greater satisfaction with privacy, an increase from 38 to 72 percent, while there was no change among clients in control clinics. The p -values for trend differences between intervention and control clinics showed that the trends of increasing client satisfaction with physical look, range of services, and privacy at intervention clinics were significantly different from the trends on these indicators at control clinics.

The mean number of quality elements with which intervention clinic clients were “very satisfied” increased from 4 to 5, while there was no significant change in this indicator among control clinic clients. The trend at intervention clinics was significantly different from the trend at control clinics.

The adjusted percentage of clients who reported being “very satisfied” on an overall measure of quality increased from 55 to 77 percent at intervention clinics, without any significant change at control clinics. Moreover, the trends at intervention and control clinics were significantly different from each other.

Table 1 also shows the adjusted percentage of returning clients. The percentage of returning clients increased from 83 to 93 percent at intervention clinics, while there was no change at control clinics. The difference in trends at intervention and control clinics on this indicator was marginally significant ($p = 0.053$).

We examined whether the increase in return visits observed at the intervention clinics was associated with higher client satisfaction. Table 2 shows factors associated with the odds of a client making a return visit to a clinic in the intervention area. Model 1 shows that an intervention client was 2.5 times as likely to make a return visit at follow-up than at baseline, even after adjusting for age, sex, education level, and marital status. Older clients were significantly more likely than younger clients to make a return visit. There was no association between either sex, education level, or marital status and return visit.

Model 2 shows that there is a reduction in the odds of a return visit at follow-up, from 2.54 in Model 1 to 2.11, after the introduction of the variable measuring the mean number of “very satisfied” responses. Moreover, every additional “very satisfied” response increases the odds of a return visit by 1.1. This suggests that part of the reason that clients are more likely to make a return visit at the intervention clinic at follow-up is their higher level of satisfaction with service quality at follow-up.

Model 3 shows that there is reduction in the odds of a return visit, from 2.54 in Model 1 to 2.10 in Model 3, after the introduction of the variable measuring overall satisfaction with services. Moreover, a person who is “very satisfied” with the quality of services is 2.85 times as likely to make a return visit as a person who is not. Model 3 leads to the same conclusion as Model 2: The increase in return visits to intervention clinics can partly be explained by higher client satisfaction levels.

A statistically significant ($p < .01$) proportion (9 percent) of the variance in return visits was explained by

Table 1. Random-effects logit models showing adjusted percentages for clinic clients' satisfaction with service quality and for return visits, exit survey

	Intervention			Control			Clinic-level correlation		
	Baseline	Follow-up	p-value	Baseline	Follow-up	p-value	p-value of difference in trend	rho	p-value
Percent very satisfied with									
Cleanliness	37.4	64.8	<.001	16.8	20.2	0.540	0.060	0.279	<.001
Essential equipment	35.3	62.2	0.001	12.7	7.7	0.183	0.002	0.303	<.001
Essential medicine	60.9	70.5	0.119	26.1	27.6	0.829	0.430	0.229	<.001
Good handling of clients	82.4	88.4	0.138	58.2	64.6	0.348	0.631	0.196	<.001
Service charge	74.6	68.6	0.381	22.1	25.1	0.654	0.360	NA	
Physical look	25.6	64.0	<.001	13.6	14.8	0.810	0.007	0.270	<.001
Range of services	40.3	71.3	0.001	16.5	11.2	0.336	0.004	0.297	<.001
Privacy	37.6	72.2	<.001	13.7	11.4	0.657	0.008	0.311	<.001
Mean number of very satisfied responses									
	4.0	5.4	0.001	2.0	2.2	0.712	0.041	0.282	<.001
Percent overall very satisfied									
	54.7	76.8	0.007	27.3	24.1	0.675	0.032	0.267	<.001
Percent making return visit									
	83.2	92.6	0.001	88.0	89.2	0.697	0.053	0.089	0.001
Sample size									
	491	435		394	298				

Note: All estimates are adjusted for age, sex, education level, and marital status.

NA: Not applicable; the multi-level model was not a good fit, as indicated by Hausman's specification test; alternately, Taylor-series linearization technique was used to account for clinic-level unobserved heterogeneity.

clinic-level unobserved factors in Model 1. The magnitude of the unobserved clinic-level influence on return visits decreased by more than one-third (from 0.09 to 0.05) and the significance level of the influence also decreased (from $p=0.006$ to $p=0.053$) when the variable measuring the mean number of satisfied responses was added to Model 1 (to get Model 2). This suggests that the unobserved clinic-level influence on return visits was mainly explained by perceived clinic quality. The impact of the clinic-level unobserved influences on return visits in Model 3 also leads to the same conclusion.

CHARGES

Since private providers may charge clients more for better-quality services, we examined whether there was any increase in what was paid for medicines and services. Table 3 shows adjusted percentages of clinic

clients who reported the amount they paid to the provider. The percentage of clients who paid 109 Nepali rupees or more increased from 13 to 22 percent at intervention clinics, while there was no change among clients at control clinics. However, the difference in trends at intervention and control clinics was not statistically significant.

We also examined whether client perceptions of the amount they paid changed over time. Since the number of cases is very small, Table 3 shows unadjusted percentages for this indicator. The unadjusted percentage of clients who reported that the service charge was moderate or high increased from 51 to 96 percent at intervention clinics,² while there was no significant change at control clinics. The p -value associated with the unadjusted trends showed that the trends at intervention and control clinics were significantly different.

2. Most of this increase was in the moderate category.

Table 2. Random-effects logit models predicting the odds of a client making a return visit to an intervention clinic, exit survey

Independent variables	Model 1		Model 2		Model 3	
	Odds ratio	p-value	Odds ratio	p-value	Odds ratio	p-value
Survey period						
Baseline	1.00		1.00		1.00	
Follow-up	2.54	0.001	2.11	0.006	2.10	0.007
Sex						
Female	1.00		1.00		1.00	
Male	0.89	0.606	0.95	0.804	0.99	0.957
Age	1.03	0.006	1.02	0.010	1.02	0.012
Education level						
None	1.00		1.00		1.00	
Secondary incomplete	1.14	0.611	1.13	0.639	1.06	0.839
Secondary or higher	1.59	0.140	1.61	0.133	1.56	0.164
Marital status						
Others	1.00		1.00		1.00	
Married	1.07	0.811	1.06	0.835	1.06	0.839
Number of very satisfied responses			1.15	<.001		
Overall satisfaction						
Other					1.00	
Very satisfied					2.85	<.001
Clinic-level correlation coefficient (rho)		0.085		0.053		0.063
p-value of chi-square (1 d.f.) test of rho=0		0.006		0.053		0.037
p-value of Hausman's test		0.718		0.129		0.256
Sample size	926		926		926	

Table 3. Random-effects logit models showing adjusted percentages paid by clinic clients for medicines and services received, exit survey

	Intervention			Control			Clinic-level correlation		
	Baseline	Follow-up	p-value	Baseline	Follow-up	p-value	p-value of difference in trend	rho	p-value
Percent who paid 109 rupees or more*	12.7	21.6	0.023	18.7	19.2	0.923	0.205	0.203	<.001
Sample size	491	435		394	298				
Percent who reported that the service charge was moderate or high**	51.1	96.3	<.001	91.7	83.3	1.00	0.017		
Sample size	47	21		12	12				

*Adjusted for age, sex, education level, and marital status. Exchange rate at time of study was 75 rupees = US1\$.

**Unadjusted estimates.

EXTENT OF IN-REACH AND OUTREACH

This section illustrates the extent to which clinic clients and respondents to the household survey recalled exposure to in-reach and outreach activities. Table 4 shows adjusted percentages of clients who reported that the provider told them about other services offered at the clinic (in-reach). There was no significant change in the percentage of clients at intervention or control clinics who were told about other services offered at the clinic. The percentage of providers who informed clients about other services offered was low: Only 8 percent of clients at intervention clinics and 7 percent at control clinics were told about other services offered.

Limited in-reach is also reflected by the low percentage of clients at intervention clinics who had heard of *Sewa* (24 percent) and who were aware that the provider they had visited was a *Sewa* member (12 percent) at follow-up. Moreover, only 1 out of 8 clients who knew that the provider was a *Sewa* member (or 1 percent of total clients at intervention clinics) learned this from the provider; 6 out of 10 learned this by looking at the signboard outside the shop (not shown).

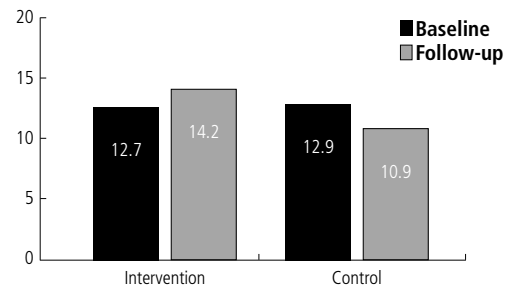
At the population level, exposure to outreach appears to be low. Respondents to the household survey also reported low awareness of *Sewa*: At follow-up, 15 percent of married women in the intervention district had heard of *Sewa*. About 8 out of 10 of these women had heard of *Sewa* through the local FM radio station, while one 1 of 10 had heard of *Sewa* from a *Sewa* promoter (not shown).

SERVICE UTILIZATION

Figure 1 shows the average number of clients (for both curative and preventive care) who visited intervention and control clinics during exit interview days. The average number at intervention clinics was 12.7 at baseline and 14.2 at follow-up. At control clinics, it was 12.9 at baseline and 10.9 at follow-up.

Table 5 shows adjusted percentages of clinic clients who reported that they or their spouse had visited the clinic for reproductive health services during the past six months. There was an increase in the percentage of clients who made an antenatal visit to intervention clinics, from less than 1 to 3 percent, but no significant change at control clinics. However, the trends at both clinics were not significantly different from each other. There was no other change in the use of other reproductive health services, nor a change in the use of “any” reproductive health services (that is, the combined services).

Figure 1. Average number of clients per day at clinics



Note: Figures are based on total number of clients visiting clinics during exit interview days.

Table 4. Random-effects logit models showing adjusted percentages for clinic clients who recalled that provider told them about other services offered, exit survey

	Intervention			Control			<i>p</i> -value of difference in trend	Clinic-level correlation	
	Baseline	Follow-up	<i>p</i> -value	Baseline	Follow-up	<i>p</i> -value		rho	<i>p</i> -value
Yes	7.5	8.5	0.723	7.3	6.7	0.839	0.697	0.205	<.001
No	92.5	91.5		92.7	93.3				
Sample size	491	435		394	298				

Note: All estimates are adjusted for age, sex, education level, and marital status.

Table 5. Random-effects logit models showing adjusted percentages for married clinic clients' (self/spouse) use of reproductive health services during the past six months, exit survey

	Intervention			Control				Clinic-level correlation	
	Baseline	Follow-up	p-value	Baseline	Follow-up	p-value	p-value of difference in trend	rho	p-value
Family planning advice	11.0	14.2	0.420	2.9	5.6	0.146	0.477	0.189	<.001
Sangini injection	5.3	8.5	0.163	1.1	2.0	0.336	0.897	0.130	<.001
Antenatal care/checkup	0.4	2.6	0.016	0.5	1.8	0.851	0.623	0.478	<.001
STI/RTI complaints	0.6	1.6	0.158	1.3	4.5	0.024	0.667	0.167	0.044
Any reproductive health services	13.2	18.0	0.403	7.0	10.9	0.243	0.845	0.246	<.001
Sample size	423	358		343	252				

Note: All estimates are adjusted for age, sex, education level, and marital status. RTI = reproductive tract infection.

Table 6 shows adjusted percentages of respondents to the household survey who reported use of any reproductive health services and use of reproductive health services from a medical store/pharmacy. Married women reported no change in use of antenatal care during their last pregnancy. (Married women of reproductive age were the only women interviewed for the household survey.) Although increases in the percentage of women who received antenatal care from a medical store/pharmacy in the intervention district (from 1 to 3 percent) and the decline in this indicator in the control district (from 2 to 1 percent) did not reach statistical significance, the trends in the intervention and control districts were significantly different from each other. There was no change in the percentage of women who reported receiving a tetanus toxoid injection during their last pregnancy, or in the percentage who reported receiving the injection from a medical store/pharmacy.

In addition, women did not report a change in use of iron-folic/calcium tablets during their last pregnancy. However, in the control district, there was an increase in use of iron-folic/calcium tablets obtained from a medical store/pharmacy, from 2 to 4 percent, and the difference in trends between intervention and control districts on this indicator was significant. There was no change in the current use of family planning. Although the increase in the percentage of women who obtained family planning methods from medical stores/pharmacies in the intervention district (from 5 to 7 percent) and the decrease in this indicator in the control district (from 3 to 1 percent) did not reach statistical significance, the trends in intervention and control districts were significantly different

from each other. Finally, the combined variable for use of any reproductive health services (including current use of family planning) did not show any change over time — nor did the combined variable for obtaining reproductive health services from medical store/pharmacy.

OUTREACH AND SERVICE UTILIZATION

We also examined whether there was an association between the use of reproductive health services and awareness of *Sewa* among exit survey and household survey respondents (not shown). There was no significant association between having heard or read about *Sewa* among clients at intervention clinics and the use of family planning advice, Sangini injection, antenatal care, or STI services at follow-up. In addition, there was no significant association between awareness of *Sewa* among women interviewed in the household survey and use of antenatal care, tetanus toxoid injection, iron-folic/calcium tablets, or current use of family planning at follow-up.

Table 6. Random-effects logit models showing adjusted percentages for married women's use of reproductive health services during the last pregnancy and for obtaining these services from medical store/pharmacy, household survey

	Intervention			Control			<i>p</i> -value of difference in trend	Clinic-level correlation	
	Baseline	Follow-up	<i>p</i> -value	Baseline	Follow-up	<i>p</i> -value		rho	<i>p</i> -value
Antenatal care									
Any use during last pregnancy	57.5	62.5	0.314	62.5	67.3	0.314	0.990	0.123	<.001
From medical store/pharmacy	1.4	3.3	0.175	2.4	0.9	0.147	0.042	NA	
Tetanus toxoid									
Use during last pregnancy	68.0	73.7	0.154	72.8	79.1	0.083	0.803	0.113	0.006
From medical store/pharmacy	1.3	1.8	0.628	0.8	0.9	0.838	0.899	NA	
Iron-folic/calcium									
Use during last pregnancy	40.6	36.5	0.526	37.5	47.0	0.173	0.156	0.269	<.001
From medical store/pharmacy	3.9	3.2	0.471	1.5	3.5	0.050	0.043	NA	
Family planning									
Current use	44.7	50.0	0.279	55.9	48.3	0.134	0.067	0.096	0.003
From medical store/pharmacy	5.4	7.0	0.262	2.8	1.2	0.113	0.036	NA	
Any reproductive health services									
Use during last pregnancy	83.4	86.6	0.144	87.4	90.3	0.165	0.908	0.079	0.247
From medical store/pharmacy	10.3	12.2	0.531	6.5	5.7	0.698	0.490	NA	
Sample size	461	495		480	471				

Note: All estimates are adjusted for age, education level, urban/rural location, and complex survey design.
 NA: Not applicable; the multi-level model was not a good fit, as indicated by Hausman's specification test; alternately, Taylor-series linearization technique was used to account for clinic-level unobserved heterogeneity.

6 Discussion

DISCUSSION

In recent years, there has been considerable interest in franchising reproductive health services in developing countries (Montagu, 2002). This interest stems both from a concern about the quality of care provided by the private health care sector and from the need to increase the supply of reproductive health services to meet demand. A search on POPLINE (<http://db.jhuccp.org/popinform/basic.html>) revealed no published study that has assessed the impact of a franchise network on the quality of care or on the utilization of reproductive health services. One recently completed unpublished study, based on cross-sectional surveys in four developing countries, shows that satisfaction with and utilization of reproductive health services was higher at health establishments that were franchised compared to those that were not (Stephenson, 2002). We used a quasi-experimental study design to assess the impact of a reproductive health franchise on client satisfaction with quality of services and utilization of these services.

Client satisfaction increased for the majority of indicators of service quality at intervention clinics, but not at control clinics (that is, cleanliness, essential equipment, physical look, range of services offered, and privacy). Return visits to clinics, used as a proxy for client loyalty, also increased at intervention clinics, but not control clinics. The increase in return visits was, in part, associated with an increase in client satisfaction. And, while client satisfaction and loyalty to the provider have increased, providers also appear to have increased their charges.

In-reach — a provider proactively informing the clinic's general health clients about reproductive health services offered — is considered essential for expanding services (Foreit, 1998). There was no change in providers' in-reach; providers did not promote the reproductive health services they offered. Outreach activities — efforts to bring new clients into the practice — also appear to have had limited impact in raising awareness of the supply of reproductive health services offered by *Sewa*. Some research has cast doubt on whether outreach activities can attract new clients when there are competing outlets for services (Foreit, 1998). Consistent with these findings, there was no significant association, in either client exit or household survey data, between awareness of *Sewa* at follow-up and utilization of reproductive health services.

At the population level, the intervention appears to have had a weak effect. While trend tests showed that there was no improvement in the intervention district versus the control district in the use of antenatal care, tetanus toxoid injections, or iron-folic/calcium tablets, the difference in trends between intervention and control districts in the use of family planning was marginally significant ($p=0.067$). Moreover, the difference in trends between intervention and control clinics in obtaining contraceptives from a medical store/pharmacy was significant. This suggests that the nurse and paramedic network may have contributed to an increase in contraceptive use. Service statistics from the fertility center franchiser do show an increase in the average monthly family planning and reproductive health visits to *Sewa* clinics from March to October 2002 — from 28 to 50 visits per clinic per month (Balal, 2003).

The weak effect of the intervention at the population level may be explained by the fact that the services typically offered by nurses and paramedics were not compatible with a substantial expansion of reproductive health services at the population level: Prior to the intervention, the vast majority of visits to these providers were illness related (at baseline, 87 percent of client visits to intervention clinics and 93 percent of control visits were non-reproductive health related). Population-level data showed that only 10 to 12 percent of the population in the intervention district went to a medical store/pharmacy for reproductive health services, suggesting that there is considerable competition for reproductive health services. In addition, it is generally thought that one of the barriers to private-sector provision of preventive services is that providers are more interested in the higher fees they can charge for curative care. Our findings indicate that while providers did succeed in increasing client satisfaction, they did not make a strong effort to increase the provision of preventive services. The focus of their practice appears to have remained on curative care.

The short period of project implementation could also help explain the weak effect of the intervention at the population level. Although the intervention was initiated in February 2001, delays due to political disturbances meant that implementation effectively began in February 2002 — resulting in an implementation period of roughly 10 months before the follow-up survey was conducted.

Appendix

APPENDIX

Table A1. Socio-demographic characteristics of exit survey clients

Background characteristics	Baseline		Follow-up	
	Control (n=394)	Intervention (n=491)	Control (n=298)	Intervention (n=435)
Sex (percent distribution)				
Female	54.3	58.3	54.4	57.2
Male	45.7	41.8	45.6	42.8
Age				
Mean	32.8	32.8	32.5	31.7
Median	29.0	28.0	30.0	29.0
Standard deviation	12.9	14.2	12.7	12.8
Marital status (percent distribution)				
Married	87.1	86.2	85.6	82.3
Unmarried	9.9	10.8	10.7	15.2
Divorced/separated	0.0	0.2	0.3	0.0
Widowed	3.0	2.9	4.4	2.5
Education level (percent distribution)				
Never attended	31.0	27.1	28.9	22.8
Primary incomplete	20.8	13.0	18.1	15.4
Primary complete	5.3	6.7	3.0	6.7
Secondary incomplete	24.4	21.6	27.2	28.5
Secondary complete	7.9	15.9	12.8	12.2
Intermediate and above	6.6	11.0	5.4	9.9
Literacy training	4.3	4.7	4.7	4.6

Table A2. Socio-demographic characteristics of household survey respondents

Background characteristics	Baseline		Follow-up	
	Control (n=480)	Intervention (n=461)	Control (n=471)	Intervention (n=495)
Location (percent distribution)				
Rural	93.8	81.6	89.4	80.1
Urban	6.2	18.4	10.6	19.9
Age				
Mean	28.9	29.6	27.4	29.4
Median	28.0	29.0	26.0	29.0
Standard deviation	7.5	7.6	7.1	7.3
Education level (percent distribution)				
Never attended	55.8	43.0	55.8	41.2
Primary incomplete	14.6	10.4	10.2	11.33
Primary complete	3.8	4.6	3.2	5.7
Secondary incomplete	11.5	15.8	13.8	18.8
Secondary complete	4.4	6.3	4.5	8.1
Intermediate and above	2.5	9.5	1.7	7.5
Literacy training	7.5	10.4	10.8	7.5

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FUNDED BY:
US Agency for International
Development

USAID Contract No.
HRN-C-00-98-00039-00

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