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

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Abstract

Objective: To assess the performance of a nurse and paramedic franchise that was established to increase client satisfaction with service quality and client utilization of reproductive health services.

Methods: A quasi-experimental study design, with baseline and follow-up measurements on nonequivalent control groups, was used to assess the impact of the intervention. 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. Civic unrest in Nepal caused major delays in project implementation: the evaluation presented in this paper covers about ten months of actual implementation.

Results: At the clinic level, client satisfaction increased at intervention but not at control clinics. Client loyalty, measured by return visits, also increased at intervention but not at control clinics. The increase in client loyalty was, in part, explained by the increase in satisfaction with service quality. At the population level, we did not find consistent increases in utilization of various reproductive health services, possibly because a) providers were not proactive in informing clients who came for general health services about the reproductive health services being offered b) mass media activities had limited impact in increasing awareness of reproductive health services being provided by the nurse and paramedic franchise c) 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, there may have been an increase in contraceptive use associated with use of the nurse and paramedic network.

Conclusions: A franchiser that provides training to franchised clinics in reproductive health service delivery and in client-provider interaction and 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.

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 governmental 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 STIs by private sector providers may have contributed to antibiotic resistance (Brugha and Zwi, 1997; Mills et al., 2002).

Much of the existing quality and price regulation of the health sector in developing countries occurs through legislation, even though the effectiveness of legislation to regulate the quality of services offered by private sector remains unknown (Kumaranayake et al., 2000). An alternative approach to improving the quality of services offered by private providers is to give incentives to change their practices, to train providers in improving quality of care and in 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 such mechanism of changing provider behavior that may lead to increasing the utilization of better quality private sector services (Montagu, 2002).

This study examines 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 assess 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.

BACKGROUND

In recent years, there has been considerable interest in the franchising of reproductive health services in developing countries. This model of service delivery groups a network of 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 provide the specific services provided by the franchise (Commercial Market Strategies, 2002).

Provider's recognition of the usefulness of being part of the network is important for the franchiser to exercise control over the quality of services provided. Provider motivation to be part of such a network comes from profits due to a higher client volume as more clients seek better quality services or because of a more loyal clientele. Brand recognition of the franchise among potential customers and an increase in the clientele motivates the provider to remain part of the network. However, the incentives offered to the provider need not be financial: many providers place value on post-medical education, learning new medical techniques and interaction with other providers (Montagu, 2002).

The franchiser increases the demand for the new services by marketing them through outreach activities (e.g. advertising and promotion) and trains the provider to market the services directly to potential clients. At the same time, through in-reach activities, the provider has to inform the client of the new services being offered and to make them interested in receiving the services (Foreit, 1998). This focus on demand creation by the provider comes from "services marketing," an approach that considers providers as having a critical role in the marketing of services. The services marketing approach also emphasizes the importance of making the provider-client relationship an explicit part of the marketing mix. By providing good quality services and by building trusting and caring relationships with clients, providers can attract new clients and build loyalty among older clients - with the purpose of increasing reproductive health service utilization (Foreit, 1998) and profits.

THE INTERVENTION

Most private physicians in Nepal have their practices in and around Khatmandu Valley. In order to expand access to reproductive health services to districts outside Khatmandu, there is a need to involve providers such as nurses and paramedics. It is estimated that there are over 12,000 trained nurses and paramedics in Nepal (Jha, 2000). A large number of these nurses and paramedics 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. Family planning services (except the IUD and sterilization), and a limited set of reproductive health services are also provided at most nurse and paramedic clinics.

A pilot fractional franchise network of 64 nurses and paramedics in the Rupandehi district was developed for the provision of good quality reproductive health services. A fractional franchise is an arrangement where an additional package of services is added to an existing practice and the additional services are offered in accordance with the guidelines of the franchiser (Montagu, 2002). The decision to launch a franchise network was based on several important considerations: a contractual arrangement was needed to facilitate ongoing quality monitoring at the nurse and paramedic clinics; there were considerable economies of scale in conducting training and promotion for a network compared to individual providers. Third, the idea was to use the network brand to promote high quality family planning and reproductive health services and bring new clients to the network clinics. The brand name chosen for the network was Sewa, which means service in Nepali. Finally, nurses and paramedics had expressed a desire to be affiliated with a larger provider community and to have linkages with other providers.

Provider recruitment: There are approximately 400 trained nurses and paramedics in Rupandehi and 190 of these have private clinics. Sewa recruited 64 providers based on a number of criteria: presence of a physical facility and a reasonable client volume, level of interest in joining the network, clinic location, existing service mix, and willingness to comply with the clinic monitoring protocols. Nurses and paramedics in Nepal go through

formal training ranging from 3 years 10 months. There are five types of providers included in the network: Staff Nurse, Health Assistant, Auxiliary Nurse Midwife, Auxiliary Health Worker, and Community Medical Assistant.

Membership contract: A contractual agreement was developed between the Franchiser, the Nepal Fertility Care Center (NFCC) and Franchisee, individual N&P provider. The membership contract specifies the roles and responsibilities of each party. The NFCC is responsible for providing training, quality monitoring, marketing support and establishing a referral system. In return, the franchisee agrees 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 $1.4 and annual membership fee of $9.00 (paid monthly).

Training: All network members were provided a seven-day training in reproductive health including family planning. A subset of female nurses and midwives also received a 21-day IUD training. Training materials were adapted from existing curricula developed by Engender Health and JHPIEGO Following topics were covered: 1) Infection prevention: decontamination procedures, waste disposal, proper handwashing, use of sterilized gloves etc., 2) Availability of essential equipment: emergency supplies, autoclave, reproductive health manual, weighing scale, examination table, IUD kit etc., 3) Provision of temporary contraceptive methods (except IUD), information about all contraceptive methods, referrals for IUD and permanent methods, techniques of counseling, screening, management of side-effects, and infection prevention., 4) Reproductive health: antenatal care including identification of high risk pregnancy (blood pressure, urine sugar/albumin, weight, anemia assessment), referral of high risk pregnancy, provision of tetanus toxoid immunization, and nutritional counseling and iron supplements, antenatal FP counseling and referral for safe delivery, post natal care including breast feeding, management and referral for common gynecological problems such as vaginal discharge, menstruation problems, pelvic inflammation etc., 5) STIs: identification of symptoms, syndromic management, counseling, couple-counseling, and counseling for AIDs prevention

A 2-day module on service marketing was also conducted, which used a combination of lecture, simulation, and group exercises. The main objective was to highlight the significance of interactive marketing that pertains to client-provider interaction and its implication for client satisfaction and loyalty. Baseline findings showed that attributes such as caring, and reliable provider are important determinants for clients in choosing a provider. Moreover, review of literature on service marketing suggests that dimensions such as empathy, trust, bonding etc. contribute to positive client-provider interaction and retaining satisfied clients. In addition to interactive marketing, providers were also introduced to various external marketing activities for the network, and opportunities for participation.

Marketing and promotion: Network members were supported with a broad range of marketing activities. Signboards with the Network logo and name were put up in front of the clinics. Other marketing activities aimed at creating awareness for the network services included radio advertisements, brochures, leaflets, door-to-door campaign, hoarding boards, clinic open house, promotional booths in local farmers' markets, and print advertisements. All network providers were given white coats/ blouses printed with network logo. Another feature was the monthly newsletter that was circulated to all members to keep them informed of the network activities, and to reinforce their affiliation with the network.

Although baseline research findings were used to develop mass media messages, the limited marketing budget did not allow for extensive formative research or for monitoring effectiveness of media activities. The radio messages included quality cues such as friendly, and caring providers of reproductive health services but perhaps fell short of reinforcing Sewa brand recognition.

Referral Linkages: Two types of referral linkages were established. The internal referral system allows providers to refer to trained female providers for IUD services. The

external linkage is established with the private physicians and government health facilities in the district for referral of more complicated health problems.

Quality monitoring: The NFCC sends a field coordinator to all network clinics each month to monitor quality of care. The main purpose of these visits is to ensure that service quality protocols are being followed in line with the training provided in the beginning. The field coordinator observes service delivery at the clinic and administers a detailed quality checklist addressing areas such as infection prevention, availability of essential supplies and equipment, and client provider interaction. Topics covered under interactive marketing pertaining to client provider interaction are further reinforced. The field coordinator also talks to the clients, if needed, to assess whether the provider is complying with quality protocols. Upon completing her assessment, she shares the results with the service provider and suggests corrective action. Field coordinator also checks the service statistics maintained at the clinic.

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

Implementation timeframe: Though the provider recruitment started as early as February 2001, it was not until a year later that all the network components were operational. Most of the marketing activities including mass media advertising, and outreach began in February 2002. It must be noted that the political and civic unrest in Nepal in the last couple of years caused major delays in the implementation. Trainers and other field staff had restricted mobility for prolonged periods of time due to the security issues and training and promotional activities were routinely interrupted. Though the provider recruitment started as early as February 2001, it was not until a year later that all the network components were operational.

METHODS

Study Design

A quasi-experimental design with baseline and follow-up measurements on nonequivalent control groups was used to assess the impact of the intervention on client satisfaction with the quality of care and client reports of service utilization. Although this design is less robust to threats of 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). A nonequivalent control group is particularly good when an intervention is introduced into one district and the comparison of program effects is made against a neighboring district that is similar but not necessarily equivalent or when training is given to one group of health providers and compared to a similar group (Fisher et al., 1991). This design is useful for this study since a) individuals visiting one set of providers are compared to individuals visiting a similar set of providers and b) individuals in one district are exposed to an intervention and compared against similar individuals in a neighboring district who serve as controls.

The intervention was implemented in Rupandehi district which has a population of 708,419, a literacy rate of 42% and a per capita income of $125 (Central Bureau of Statistics, 2001). The control district, Nawalparsi, is adjacent to Rupandehi and is fairly similar with a population of 562,870, a literacy rate of 38% and a per capita income of $99. The contraceptive prevalence rate is 36% in Rupandehi is 42% in Nawalparsi (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 provide results that are consistent with observations of client-provider interactions (Bessinger and Bertrand, 2001). Exit surveys are recommended as 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, fee paid for services, awareness of the Sewa network and the socio-demographic characteristics of clinic clients. The provider instrument 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 on the socio-demographic characteristics of respondents.

Data collection

Baseline surveys were conducted during April and May 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 (CREHPA), a research firm based in Nepal.

A ten-day training of fieldworkers was conducted prior to baseline data collection, which included pre-testing and finalization of the instruments. An intensive five-day training of fieldworkers was conducted prior to follow-up data collection. All interviewers were conducted by females.

In the intervention district, the baseline provider survey gathered information from 35 out of 70 providers (or 50%) who were initially expected to be part of the network. The follow-up provider survey gathered information from 32 out of 64 providers (or 50%) 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 medicine 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, all nurses and paramedics in locations selected after geographic

stratification were first listed. Providers were then randomly selected within provider qualification strata.

For the client exit surveys in each district, 24 out of 35 providers (70%) at baseline and 22 out of 32 providers (70%) at follow-up were randomly selected from the list of nurses and paramedics that had been selected for the provider survey. Interviewers were stationed at each clinic for a two-day period, during which time they interviewed clients exiting the clinics, irrespective of age or gender. Clients who did not have time for an interview because of other appointments were not interviewed. About 70% clients who visited clinics during the period of the exit survey were interviewed. The socio-demographic characteristics of respondents at intervention and control clinics are shown in the Appendix, Table A. Just over half the respondents to the client exit surveys were female, about eight out of ten were married and less than one in three had never attended school. The mean age of exiting clients was 33 years.

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

For the household survey, a multi-stage sampling design was used with 480 households in the intervention and 480 households in the control districts selected through systematic random sampling at baseline. Married women 15-45 were interviewed. In the intervention district, nine Village Development Committees (VDC) and four urban municipality wards were randomly selected. A similar procedure was adopted in the control district, with nine VDCs being randomly selected. However, there were only two urban municipality wards in the control district and both were selected. Voter's lists, maintained by the municipal ward chairman, were used for household listing in urban areas. In rural areas, households were listed with the assistance of local ward representatives. The same sample selection procedure was used at follow-up, with one difference: one VDC in each of intervention and control districts was not accessible due to political problems and had to be replaced.

The socio-demographic characteristics of women interviewed in the household surveys in the intervention and control districts are shown in the Appendix, Table B. The mean age of women in the household surveys was about 29 years. Women in the control district had lower levels of education than women in the intervention district: more than half of women in the control district compared with four out of ten women in the intervention district had never attended school.

Data Analysis

The outcome variables that used in this analysis were mostly dichotomous. The only continuous outcome variable used in the study 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 it is the ordinary least squares (OLS) method. The impact of the intervention after controlling for background characteristics (age, sex, education, marital status etc.) of the respondents can be obtained using the following equations (1) and (2) for the logit and OLS models respectively:

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

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

Where, 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 represent trend (follow-up versus baseline), group (intervention versus control), control (age, sex, education, marital status etc.) and the error terms respectively. The logit or the OLS model would estimate the coefficients β_0 (intercept), β_2 (trend effect), β_2 (group effect), β_3 (intervention impact) and β_4 (control variable age/education etc. effect).

However, the above-proposed methods did not account for the cluster sampling nature of the exit-interview and the 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 were significantly correlated, then, even though the coefficient/parameter estimates from the equations (1) and (2) would be unbiased, the equations would provide biased hypothesis test (Angeles & Mroz, 2001; Brown, Madise & Steel, 2002; StataCorp, 2001). The appropriate models that accounts for the clinic-/cluster-level correlated responses can be specified using the following equations (3) and (4) for the binary and continuous outcome variables respectively:

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

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

Where, 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 approach was to use multi-level random effect models. The major advantage of Eicker-Huber-White procedure is that little or no assumptions of the population distribution are required. However, the drawback of the robust procedure is that it is not efficient[1], and it fails to accurately estimate the clinic-/cluster-level correlation (Brown, Madise & Steel, 2002; StataCorp, 2001).

[1] The Eicker-Huber-White method is conservative, and produces upward biased variance estimates and decreases the statistical power of the hypothesis tests (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 generalized least squares (GLS) method. For the GH method the clinic-/cluster-level correlation (ρ or row) was estimated using the formula $\rho = u_i / (u_i + 1)$, and for the GLS method, the row was estimated using the formula $\rho = u_i / (u_i + \varepsilon_{ij})$. The significant level (at p<.05) of the row was determined using chi square statistics (StataCorp, 2001). If the row was not significant, then the simple logit or the OLS model were 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. 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 using 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 (see StataCorp, 2001; Hausman, 1978).

Therefore, the steps for identifying the best-fit model for a particular outcome was 1) estimate the multi-level random effect model, 2) test the random effect assumption using Hausman's specification test, 3) if the Hausman's test indicated that the random effect assumption was adequate and the row was significant (at p<.05), then the multi-level random effect model was identified as the best-fit; if the random effect assumption was adequate but the row was not significant, then the ordinary logit or OLS was identified as the best-fit model; however, 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. The best-fit models were used for all hypotheses tested, and 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.

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% ($p<0.001$), while there was no significant change in this indicator at control clinics (17% at baseline and 20% 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% 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. Neither did clients at intervention or control clinics report higher satisfaction with client handling or with service charges. Client satisfaction with the physical outlook of the clinic increased from 26% to 64% at intervention clinics, while there was no significant change at control clinics. Satisfaction with the range of services offered increased from 40% to 71% 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%, while there was no change among clients in control clinics. P-values for trend differences between intervention and control clinics showed that the trends of increasing client satisfaction with physical outlook, with the range of services and with privacy at intervention clinics were significantly different from the trends on these indicators at control clinics.

The mean number of elements of quality that intervention clinic clients were very satisfied with 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% 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% 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 ($p=0.053$).

Table 1 about here

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 gender, age, education and marital status. Older clients were significantly more likely to make a return visit than younger clients. There was no association between either gender or education 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 in Model 2, 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 1.15. This suggests that part of the reason that a client is 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 the higher level of satisfaction of clients.

A statistically significant ($p<.01$) proportion (9 percent) of the variance in return visits was explained by 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 $p=.006$ to $p=.053$) when the variable measuring the mean number of satisfied responses was added to Model 1 (to get Model 2), suggesting 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.

Table 2 about here

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% 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 if 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% 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.

Table 3 about here

Extent of in-reach and outreach

This section illustrates the extent to which clinic clients and respondents to the household survey recall 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. Moreover, the percentage of providers who informed clients about other services offered was low: only 8% of clients at intervention clinics and 7% at control clinics were told about other services offered.

Table 4 about here

Limited in-reach is also reflected by the low percentage of clients at intervention clinics who had heard of Sewa (24%) and who were aware that the provider they had visited was a Sewa member (12%) at follow-up. Moreover, only one out of eight clients who knew that the provider was a Sewa member (or 1% of total clients at intervention clinics) learnt this from the provider, while six out of ten learnt 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% of married women in the intervention district had heard of Sewa. About eight out of ten of these women had heard of Sewa through the FM radio station, while one out of ten had heard of Sewa from a Sewa promoter (not shown).

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

Service utilization

Figure 1 shows the number of total clients (i.e. clients for both curative and preventive care) who visited intervention and control clinics each day during the two days of the client exit interview. The average number of clients at intervention clinics was 12.7 at baseline and 14.2 at follow-up. At control clinics, 12.9 clients were recorded 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 last 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%, but no change at control clinics. However, the trends at intervention and control 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 (i.e. the reproductive health services combined).

Table 5 about here

Table 6 shows adjusted percentages of respondents to the household survey who reported use of 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. Although increases in the percentage of women who received antenatal care from a medical store/pharmacy in the intervention district (from 1% to 3%) and the decline in this indicator in the control district (from 2% to 1%) did not reach statistical significance, the trends in the intervention and control district were significantly different from each other. There was no change in the percentage of women who reported receiving a tetanus toxoid injection during last pregnancy or in the percentage who reported receiving it from medical store/pharmacy. Also, women did not report a change in use of iron-folic tablets during their last pregnancy. However, in the

control district, there was an increase in use of iron folic tablets obtained from medical store/pharmacy, from 2% to 4%, 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%) and the decrease in this indicator in the control district (from 3% to 1%) 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 show any change over time.

Table 6 about here

Outreach and service utilization

We also examined if 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, STI services at follow-up. There was also no significant association between awareness of Sewa among women interviewed in the household survey and use of antenatal care, tetanus toxoid injection, iron folic tables or current use of family planning at follow-up.

DISCUSSION

In recent years, there has been considerable interest in the franchising of reproductive health services in developing countries (Montagu, 2002). This interest comes both from a concern about the quality of care provided by the private health care sector in developing countries and from the need to increase the supply of reproductive health

services to meet the demand for these services. 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 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 the quality of services and their utilization of these services.

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

In-reach, or the provider's proactively informing general health clients about the reproductive health services offered at the clinic, is considered essential for expanding services (Foreit, 1998). There was no change in providers' in-reach, as providers did not promote the reproductive health services that they offered. Outreach activities, or 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 by Sewa. Some research has cast doubts as to 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 the client exit or the 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 intervention versus control districts in the use of antenatal care, tetanus toxoid injections or iron folic tablet, 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 medical stores/pharmacies was significant. This suggests that the nurse and paramedic network may have contributed to an increase in contraceptive use. Service statistics obtained from NFCC 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 because the services 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% of client visits to intervention clinics and 93% to control visits were non-reproductive health related. Population level data showed that only 10-12% of the population in the intervention district went to medical store/pharmacy for reproductive health services, suggesting that there is considerable competition for reproductive health services. 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.

An additional explanation for the weak effect of the intervention at the population level could also be the short period of project implementation. Although the intervention was initiated in February 2001, delays due to political disturbances meant that implementation effectively began in February 2002. This resulted in an implementation period of about 10 months before the follow-up survey was conducted.

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

	Intervention			Control			p-value of difference in trend	Clinic-level correlation	
	Baseline	Follow-up	p-value	Baseline	Follow-up	p-value		Row	p-value
% very satisfied with …									
Cleanliness	37.4	64.8	<.001	16.8	20.2	.540	.060	.279	<.001
Essential equipments	35.3	62.2	.001	12.7	7.7	.183	.002	.303	<.001
Essential medicines	60.9	70.5	.119	26.1	27.6	.829	.430	.229	<.001
Good handling of clients	82.4	88.4	.138	58.2	64.6	.348	.631	.196	<.001
Service charge	74.6	68.6	.381	22.1	25.1	.654	.360	NA	
Physical look	25.6	64.0	<.001	13.6	14.8	.810	.007	.270	<.001
Range of services	40.3	71.3	.001	16.5	11.2	.336	.004	.297	<.001
Privacy	37.6	72.2	<.001	13.7	11.4	.657	.008	.311	<.001
Mean number of very satisfied responses	4.0	5.4	.001	2.0	2.2	.712	.041	.282	<.001
% overall very satisfied	54.7	76.8	.007	27.3	24.1	.675	.032	.267	<.001
% making return visit	83.2	92.6	.001	88.0	89.2	.697	.053	.089	.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 indicated by the Hausman's specification test; alternately, Taylor-series linearization technique was used to account for clinic-level unobserved heterogeneity

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**	
	OR	**p-value**	**OR**	**p-value**	**OR**	**p-value**
Survey period						
Baseline	1.00		1.00		1.00	
Follow-up	2.54	0.001	2.11	0.006	2.10	.007
Sex						
Female	1.00		1.00		1.00	
Male	0.89	0.606	0.95	.804	0.99	.957
Age	1.03	0.006	1.02	.010	1.02	.012
Education						
None	1.00		1.00		1.00	
Secondary incomplete	1.14	0.611	1.13	.639	1.06	.839
Secondary or higher	1.59	0.140	1.61	.133	1.56	.164
Marital Status						
Others	1.00		1.00		1.00	
Married	1.07	0.811	1.06	.835	1.06	.839
Number of very satisfied responses			1.15	<.001		
Overall satisfaction						
Other					1.00	
Very satisfied					2.85	<.001
Clinic-level correlation coefficient (row)	0.085		0.053		0.063	
p-value of chi squared (1 d.f.) test of row=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			p-value of difference in trend	Clinic-level correlation	
	Baseline	Follow-up	p-value	Baseline	Follow-up	p-value		Row	p-value
% paid 109 rupees or more*	12.7	21.6	0.023	18.7	19.2	0.923	0.205	.203	<.001
Sample size	491	435		394	298				
% who reported that the service charge was moderate or high*	51.1	96.3	<.001	91.7	83.3	1.00	.017		
Sample size	47	21		12	12				

*Adjusted for age, sex, education level, and marital status

**Unadjusted estimates

Table 4: Random effects logit models showing adjusted percentages for clinic clients' recalling that provider told them about other services offered, exit survey

	Intervention			**Control**			p-value of difference in trend	Clinic-level correlation	
	Baseline	Follow-up	p-value	Baseline	Follow-up	p-value		Row	p-value
Yes	7.5	8.5	.723	7.3	6.7	.839	.697	.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

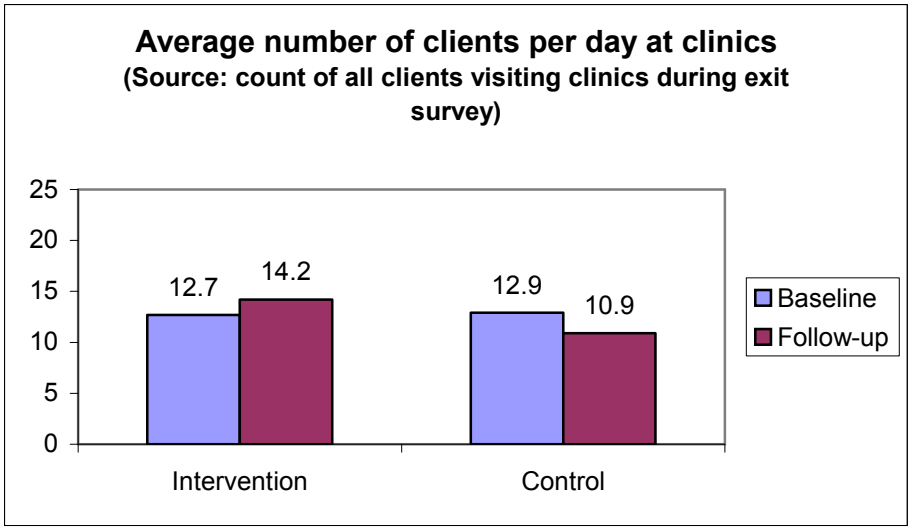
Average number of clients per day at clinics
(Source: count of all clients visiting clinics during exit survey)
25
20
15
10
5
0
12.7
14.2
12.9
10.9
Intervention
Control
Baseline
Follow-up

Table 5: Random effects logit models showing adjusted percentages for married clinic clients' (self/spouse) use of reproductive health services during the last 6 months, exit survey

	Intervention			**Control**			p-value of difference in trend	Clinic-level correlation	
	Baseline	Follow-up	p-value	Baseline	Follow-up	p-value		Row	p-value
Family planning advice	11.0	14.2	.420	2.9	5.6	.146	.477	.189	<.001
Sangini injection	5.3	8.5	.163	1.1	2.0	.336	.897	.130	<.001
Antenatal care/check-up	0.4	2.6	.016	0.5	1.8	.851	.623	.478	<.001
STD/RTI complaints	0.6	1.6	.158	1.3	4.5	.024	.667	.167	.044
Any reproductive health service	13.2	18.0	.403	7.0	10.9	.243	.845	.246	<.001
Sample size	423	358		343	252				

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

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

	Intervention			Control			p-value of difference in trend	Cluster-level total correlation	
	Baseline	Follow-up	p-value	Baseline	Follow-up	p-value		Row	p-value
Antenatal care									
Any use during last pregnancy	57.5	62.5	.314	62.5	67.3	.314	.990	.123	<.001
From medical store/pharmacy	1.4	3.3	.175	2.4	0.9	.147	.042	NA	
TT									
Use during last pregnancy	68.0	73.7	.154	72.8	79.1	.083	.803	.113	.006
From medical store/pharmacy	1.3	1.8	.628	0.8	0.9	.838	.899	NA	
Iron-folic/calcium									
Use during last pregnancy	40.6	36.5	.526	37.5	47.0	.173	.156	.269	<.001
From medical store/pharmacy	3.9	3.2	.471	1.5	3.5	.050	.043	NA	
Family planning									
Current use	44.7	50.0	.279	55.9	48.3	.134	.067	.096	.003
From medical store/pharmacy	5.4	7.0	.262	2.8	1.2	.113	.036	NA	
Any reproductive health services									
Use during last pregnancy	83.4	86.6	.144	87.4	90.3	.165	.908	.079	.247
From medical store/pharmacy	10.3	12.2	.531	6.5	5.7	.698	.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 indicated by the Hausman's specification test; alternately, Taylor-series linearization technique was used to account for clinic-level unobserved heterogeneity

APPENDIX

Table A: Socio-demographic characteristics of exit survey clients

Background Characteristics		Baseline				Follow-up			
		Control (n=394)		Intervention (n=491)		Control (n=298)		Intervention (n=435)	
Gender	Female	54.3	214	58.3	286	54.4	162	57.2	249
	Male	45.7	180	41.8	205	45.6	136	42.8	186
Age	Mean	32.8		32.8		32.5		31.7	
	Median	29.0		28.0		30.0		29.0	
	s.d.	12.9		14.2		12.7		12.8	
Marital status	Married	87.1	343	86.2	423	85.6	252	82.3	358
	Unmarried	9.9	39	10.8	53	10.7	32	15.2	66
	Divorced/separated	0.0	0	0.2	1	0.3	1	0.0	0
	Widow	3.0	12	2.9	14	4.4	13	2.5	11
Education	Never attended	31.0	122	27.1	133	28.9	86	22.8	99
	Primary incomplete	20.8	82	13.0	64	18.1	54	15.4	67
	Primary complete	5.3	21	6.7	33	3.0	9	6.7	29
	Secondary incomplete	24.4	96	21.6	106	27.2	81	28.5	124
	Secondary complete	7.9	31	15.9	78	12.8	38	12.2	53
	Intermediate and above	6.6	25	11.0	54	5.4	16	9.9	43
	Literacy training	4.3	17	4.7	23	4.7	14	4.6	20

Table B: 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	Rural	93.8	450	81.6	376	89.4	462	80.1	418
	Urban	6.2	30	18.4	85	10.6	55	19.9	104
Age	Mean	28.9		29.6		27.4		29.4	
	Median	28.0		29.0		26.0		29.0	
	s.d.	7.5		7.6		7.1		7.3	
Education	Never attended	55.8	268	43.0	198	55.8	253	41.2	204
	Primary incomplete	14.6	70	10.4	48	10.2	48	11.33	56
	Primary complete	3.8	18	4.6	21	3.2	15	5.7	28
	Secondary incomplete	11.5	55	15.8	73	13.8	65	18.8	93
	Secondary complete	4.4	21	6.3	29	4.5	21	8.1	40
	Intermediate and above	2.5	12	9.5	44	1.7	8	7.5	37
	Literacy training	7.5	36	10.4	48	10.8	51	7.5	37