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SUMMARY

The Hospital Roosevelt is Guatemala's largest hospital, and serves as a referral and training facility for the entire country. Within the Hospital Roosevelt, the Department of Obstetrics and Gynecology established a Reproductive Health Unit (RHU) to offer family planning information and services to obstetrics inpatients and OB/GYN outpatient clients, and to serve as a training site for medical residents completing their OB/GYN rotations.

Several entities provided financial and in-kind resources to the RHU. The Hospital Roosevelt provided the physical infrastructure, the Ministry of Health (MSPAS) contributed contraceptive commodities (donated by USAID/Guatemala), and other international agencies purchased equipment and trained staff to provide various reproductive health services. The RHU itself was tasked with covering the costs of some staff and medical supplies through user fees.

Hospital administrators requested assistance from the Frontiers in Reproductive Health Program (FRONTIERS) to help establish a fee schedule for the RHU. The RHU had set the goal of paying its own personnel costs after one year of operation. The FRONTIERS study included three elements:

- a cost study to calculate full economic costs of the RHU as well as ongoing financial requirements;

- a willingness-to-pay (WTP) and ability-to-pay (ATP) survey to gauge demand for services and to assess the economic status of potential RHU clients;

- scenarios showing different ways for the RHU to expand services and reduce prices, while earning enough revenue to cover its monthly financial obligations.

The FRONTIERS study found that the RHU was easily earning enough revenue to break even, but was unable to meet demand for tubal ligation because of limited access to surgical facilities. Several options were outlined for increasing production of tubal ligation while continuing to generate revenue to cover the expenditures for which the RHU is responsible.

CONTENTS

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INTRODUCTION

Declining public resources in many developing countries have constrained government capacity to expand reproductive health (RH) services as recommended at major international conferences in Cairo and Beijing. Government spending on health services tends already to be low in per-capita terms, and public health officials face the difficult task of trying to sustain existing levels of service in the face of increasing demand. Public resources often are absorbed disproportionately by large urban hospitals providing costly in-patient care, while outpatient RH services receive lower priority. In this context of scarce resources and competing demands, new RH initiatives stand little chance of receiving sufficient, sustained public funding.

Governments that wish to provide new RH services are finding it necessary to formulate alternatives to the traditional model of centrally-funded health services. One option is to establish cooperative financing arrangements that distribute the cost burden of services among different entities such as international donors, clients, private voluntary organizations (PVOs) and governments themselves. Some of these entities may prefer to finance only certain types of inputs. For example, international donors may be willing to provide equipment or contraceptive commodities, but refuse to finance personnel costs. Governments may lack the funds to purchase medical supplies, but may be able to re-assign existing human or capital resources. Health authorities face two challenges in creating co-financed services: first, they must assemble the inputs needed to launch the program; and second, they must ensure a steady stream of funding to cover recurring costs such as personnel, maintenance and supplies.

A. Program Setting

The Hospital Roosevelt in Guatemala City is one of two major public-sector hospitals providing inpatient and outpatient care in the metropolitan area, and Guatemala's largest medical facility of any kind. Originally founded in 1955 as a provider of tertiary care to residents of the capital, the hospital's mandate has been expanded, and now more than 50 percent of hospital clients are referrals from lower-level providers in outlying departments. Hospital employees number approximately 1,800, including 120 specialist physicians, 180 general practitioners, 110 professional nurses and 660 auxiliary nurses. During the year ending in June 1998, Hospital Roosevelt provided 47,584 general outpatient consultations, 98,152 ophthalmology consultations and 32,611 pediatrics visits. In reproductive health, hospital staff provided during the same period 5,399 gynecological consultations and 6,828 obstetrical consultations, and attended 10,200 births. Hospital Roosevelt also serves as the main government facility for medical training in the country.

B. Role of the *Patronato*

In 1977, the Government of Guatemala established a quasi-independent *Patronato* (somewhat analogous to a board of trustees) at the Hospital Roosevelt, whose role was to create separation between the delivery of health services and financial/administrative

functions. This body includes a governing board (appointed for four-year terms), and a general assembly that includes voluntary and appointed associates representing both the public and private sectors. Initially, the *Patronato* generated income from private donations, festivals and other fund rising activities; currently, its responsibilities include collection of fee revenue and disbursement of funds to pay staff and purchase equipment and supplies.

In recent years, the *Patronato* has supported efforts by some hospital departments to recover costs through user fees. For example, the Ophthalmology unit instituted measures to reduce costs and generate income that enabled the unit to become financially self-sufficient. Currently, the unit purchases materials and supplies directly from international distributors at lower prices than can be obtained in Guatemala. Clients pay approximately US$2 for a consultation, with the exact fee based on a brief "ability-to-pay" interview carried out by a social worker. Clients can also purchase eyeglasses and medicines at prices that are considerably lower than in the commercial sector, but still high enough to contribute net income to the unit. Another source of income is contracts with private physicians (US$100 per year) to provide access to rental of high-tech equipment, current literature and other services.

A second example of creative co-financing arranged by the *Patronato* is the ambulatory surgery center at the Hospital Roosevelt, which was established in 1994. The hospital provided the physical infrastructure, while the government of Japan donated medical and surgical equipment and an initial stock of supplies to cover the start-up period. Physicians are compensated on a per-service basis. Consultations are offered at a subsidized price of US$1.50, but fees for surgical procedures are based on underlying resource costs plus a profit margin. The ambulatory surgery center broke even in its first year of operation, and currently generates net income of approximately US$100,000 per year.

C. The Reproductive Health Unit (RHU)

In early 2000, Hospital officials created an on-site reproductive health unit (RHU) to provide information and services for family planning, sexually transmitted diseases (STD) and cervical cancer screening. Based on the experience of other self-financed hospital units, hospital officials predicted that demand for reproductive health services among hospital clients would be strong enough to permit the RHU to self-finance costs of staff and some supplies. Health authorities also expected the RHU to contribute to the stated MSPAS goal of reducing maternal and perinatal mortality among the hospital's target population by 50 percent by the year 2004.

Resources to launch the RHU came from several sources. The Hospital Roosevelt provided physical infrastructure (building and utilities), medical supplies and support for some staff positions, while the MSPAS (with USAID/Guatemala support) provided contraceptive commodities. Two US-based cooperating agencies (AVSC and JHPIEGO) furnished equipment and training to staff to provide various reproductive health services. The RHU itself was given the responsibility for generating enough fee revenue to cover a portion of staff salaries and the cost of ultrasound maintenance. Collection and disbursement of fee revenue was the responsibility of the *Patronato.*

D. Statement of the Problem

RHU officials recognized that user fees would be required in order to ensure that the RHU could self-finance personnel costs. But they were uncertain how much revenue was needed each month, and how to price the different services in order to reach the monthly revenue target. Therefore, RHU officials requested assistance from FRONTIERS to analyze the costs and demand for services, and to design a fee schedule that would produce enough revenue to cover staff costs, while simultaneously keeping prices for priority services as low as possible. RHU officials hoped that the unit would be self-financing by the end of its first year of operation (February 2001).

OBJECTIVES

- To estimate recurrent and capital costs, and classify these according to which entity covered the cost;
- To analyze factors influencing potential demand for RHU services, including client willingness-to-pay (WTP) and ability-to-pay (ATP);
- To calculate the current capacity of the RHU to produce various services;
- To produce simulations of RHU revenues and break-even points under different scenarios of demand and productivity of the RHU.

METHODS

A. Cost Analysis

RHU officials produced a list of reproductive health services offered, and a list of all resources (labor, materials and capital) used to provide services. Information on costs of these resources was collected from various sources: RHU officials provided information on monthly salaries and benefits paid to RHU employees; detail on medicines and supplies used for each type of procedure; and estimates of costs of physical space occupied by the RHU. Costs of equipment were extracted from shipping documents that accompanied donated items, while the hospital administrator provided information on miscellaneous expenditures (electricity, water, telephone, others).

Costs then were classified according to whether they were recurrent or capital costs, and according to the entity bearing the cost burden. Recurrent costs are associated with resources that will be consumed or replaced within one year or less, while capital costs are defined as the annual cost of resources with a life expectancy of more than one year. Capital costs were annualized using assumptions about the opportunity cost of capital and the estimated useful life of each item. Cost data were then used to calculate two indicators of interest to the MSPAS: (1) the total *annual economic cost* of the RHU, which includes the costs of all resources regardless of who bears the cost; and (2) the *monthly financial expenditure* on resources for which the RHU is responsible. This second indicator is also the revenue target that the RHU must reach to achieve self-financing.

B. Client Willingness and Ability-to-Pay for RHU services

Information about the target market is crucial for price setting, but little was known about the economic status of Hospital Roosevelt clients. A questionnaire was designed and administered to three groups of women that constitute much of the potential market for RHU services:

- inpatient clients at the Hospital Roosevelt currently receiving care for an obstetric event (vaginal or cesarean delivery, post-abortion care);
- outpatient OB/GYN clients at the Hospital Roosevelt;
- women obtaining MCH services at outlying urban hospitals (known as *periféricas*) that belong to the Hospital Roosevelt network; these facilities were thought to be a potentially important source of referrals to the RHU.

All respondents were asked about their knowledge and previous use of contraceptive methods and other services that the RHU provides. Next, they were asked about their plans to use or continue using these services in the future. Clients that stated an intention to use a contraceptive method or service that the RHU provides were asked about their willingness to pay a range of fees. For example, prospective users of temporary methods were asked

whether they would pay a fee based on the commodity cost plus the cost of disposable supplies consumed during the visit[1]. In the case of sterilization, all clients reporting intentions to use a family planning method were also asked whether they were interested in receiving a tubal ligation within the next two years. Those that responded affirmatively to this question were administered the willingness-to-pay module for tubal ligation.

Willingness-to-pay questions took the form of a bidding game, which began by asking the respondent if she would pay a specific price for the method or service that she intended to use in the future. If she accepted the first price, a second higher price was presented; if she rejected the first price, a second lower price was offered. All respondents were asked to state the maximum price they would pay for the service in question. The survey instrument also included an ability-to-pay (ATP) module that solicited information on educational attainment, employment, family income, housing characteristics, ownership of durable goods, and expenditures on various goods and services.

C. RHU Revenue Scenarios

Main factors influencing the revenue-producing potential of the RHU are demand for services and the capacity of the unit to respond to demand. Current RHU revenues were calculated by multiplying the unit price of each service by the average number of services provided during the six-month period for which data were available. Results of the willingness-to-pay survey were used to estimate the potential demand for RHU services at different price points.

Staffing and physical infrastructure impose a limit on the number of consultations or procedures that can be performed in any unit of time. Hours of staff time and access to Hospital Roosevelt infrastructure (mainly operating rooms) were calculated, and used to estimate maximum output of various services. One scenario was developed that showed the impact on revenues of increasing the production of ultrasounds. Production of tubal ligation was already at full capacity, and so two scenarios for increasing capacity were produced: first, by reassigning existing surgical rooms and hiring additional salaried labor; and second, by using surgical rooms outside of normal working hours and hiring contract labor. Revenues under each of these scenarios were then compared to monthly financial costs to gauge the RHU's capacity for self-financing expenditures not covered by other entities.

[1] Although the RHU does not plan to chare for temporary contraceptive methods, RHU officials wanted to know if commodity costs could be recovered from users if the MOH were to terminate its provision of free contraceptive commodities to the RHU.

RESULTS

Study findings are presented in four main sections. First, the results of the cost analysis are presented. Second, we construct a brief socioeconomic profile of current clients of the Hospital Roosevelt system. Third, we summarize evidence on client demand and willingness-to-pay for various services provided at the RHU. Finally, we estimate total RHU revenues under different assumptions of demand, capacity and productivity.

A. Economic and Financial Costs of the Reproductive Health Unit

Total monthly economic costs of the RHU include the costs of all resources used, regardless of who pays for these resources. As shown in Table 1, the total economic cost of operating the RHU per month was slightly more than US$11,000. Major resource categories included personnel, disposable supplies, equipment and furniture, physical space, and facility overhead. Personnel costs (42%) accounted for the largest share of total economic costs, followed by disposable supplies (22%) and infrastructure (14%). The final column of the table shows the portion of total monthly costs that the RHU must cover from fee revenue. Other costs are covered by the Hospital Roosevelt and USAID (through the Ministry of Health and various Cooperating Agencies), and so in order to break even, the RHU must collect approximately US$3,000 per month from client fees.

Table 1: Monthly Economic Cost of the RHU, by Cost Category (US$)

Cost Category	Total	% of Total	Funded By RHU
Personnel	4,741	42	**2,513**
Disposable Supplies*	2,440	22	**0**
Equipment and Furniture	1,072	10	**0**
Infrastructure	1,520	14	**0**
Indirect Costs	1,398	12	**473**
Total	US$ 11,171	100%	**US$ 2,986**

B. Socioeconomic Characteristics of Survey Respondents

The survey was conducted in five sites: in the Hospital Roosevelt itself, and in four large maternal-child health (MCH) clinics that form part of Guatemala City's public-sector health system. Table 2 presents five basic socioeconomic indicators describing the survey population. Overall, respondents were young, low-parity women, with low to moderate levels of education and household income. Characteristics of clients visiting the Hospital

Roosevelt were virtually identical to the characteristics of clients attending the outlying MCH clinics. The only difference was seen in the household goods index (which serves as a proxy for client wealth), where the median score was slightly higher for Hospital clients.

Table 2: Indicators of Client Socioeconomic Status, by Site of Interview

Indicator	*Interview Site*			
	Hospital (n=701)		**Clinic (n=1767)**	
	Median	**Range**	**Median**	**Range**
Age in years	25	15 – 45	25	15 – 45
Number of living children	2	0 – 11	2	0 – 12
Years of schooling	6	0 – 18	6	0 – 18
Household goods index*	27.1	0 – 100	26.0	0 – 100
Monthly income (US$)	166	6 – 5,130	166	3 – 2,494

Medians are presented in place of means because values are not normally distributed, and in some cases the distributions are multi-modal or influenced by extreme outlying values.

* Elements of the household goods index are weighted so that goods owned by fewer respondents have greater weight in the final score. The index includes the following elements: household source of water, type of household toilet facilities, ownership of television, refrigerator, telephone, cellular phone, automobile, radio and cable television.

For various reasons, self-reported data on household incomes are thought to be somewhat unreliable. First, clients may decide intentionally to overstate or understate their incomes because of perceived risks of giving an honest answer. Second, earned income may not be a valid indicator of household economic status in situations where barter is a common feature of economic life. It may be useful to supplement information on household income with data on client expenditure patterns. Below we present two indicators of client consumption (see Table 3). Use of commercial-sector health services by clients of a public hospital provides an indication of client willingness to substitute fee-for-service for free services. Such a decision could indicate a desire to avoid travel costs or a lengthy wait for service at the public facility, or may suggest a preference for "commercial-sector quality" for a service. Consumption of beauty-related goods and services is a purely discretionary expenditure that may also indicate whether clients have command over household resources. The main message of Table 3 is that prospective RHU clients are not uniformly destitute, as public-sector administrators and policy-makers often assume them to be. Rather, a substantial proportion has the means to purchase health care in the commercial sector, and also to purchase beauty-related goods and services. One could argue that these same clients could afford to pay fees for some RHU services.

Table 3: Two Indicators of Client Consumption, by Site of Interview

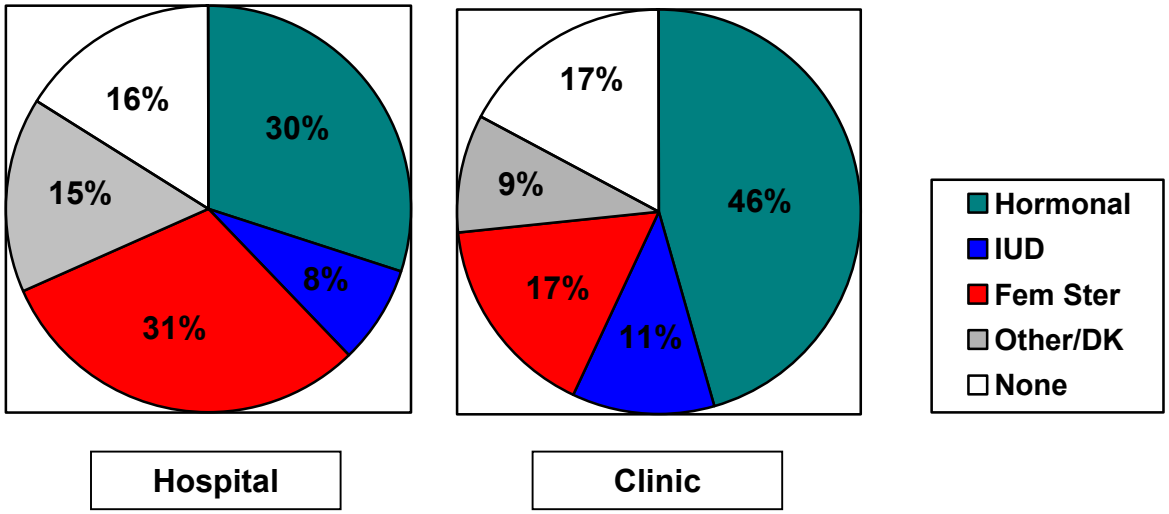
Indicator	*Interview Site*	
	Hospital (n=701)	**Clinic (n=1767)**
Percent reporting expenditure in last 3 months on health-related goods or services in the commercial sector	57.8	52.6
Most recent expenditure of those reporting (median)	US$6.50	US$9.10
Percent reporting expenditure in last 3 months on beauty-related goods or services	29.2	36.3
Most recent expenditure of those reporting (median)	US$3.90	US$5.20

C. Demand and Willingness to Pay for Reproductive Health Services at the Hospital Roosevelt

Overall, approximately two-thirds of all clients surveyed said they wanted no more children. Consequently, demand for family planning was strong. As shown in Figure 1, more than 80 percent of clients in both sites said that they intended to use or to continue using a contraceptive method in the next year.[2] The first choice of methods among hospital clients was tubal ligation (31%), followed by hormonal methods (30%). Two-thirds of the women in the hormonal group intended to use or continue using the three-month injectable DMPA. In clinics, these preference patterns were reversed, with 46 percent of clients intending to use or continue using hormonal methods (two-thirds of these would choose DMPA) and 17 percent planning to use tubal ligation. The IUD, although accounting for only 3.7 percentage points of contraceptive prevalence among urban women in Guatemala (DHS, 1999), was the first choice of 11 percent of clinic clients and 8 percent of hospital clients.

[2] We report "intention to use" a method rather than "current use" because more than two-fifths of respondents were interviewed during the perinatal period, when they would not be using a method.

Figure 1: Client Intention to Use or Continue Using Family Planning, by Method

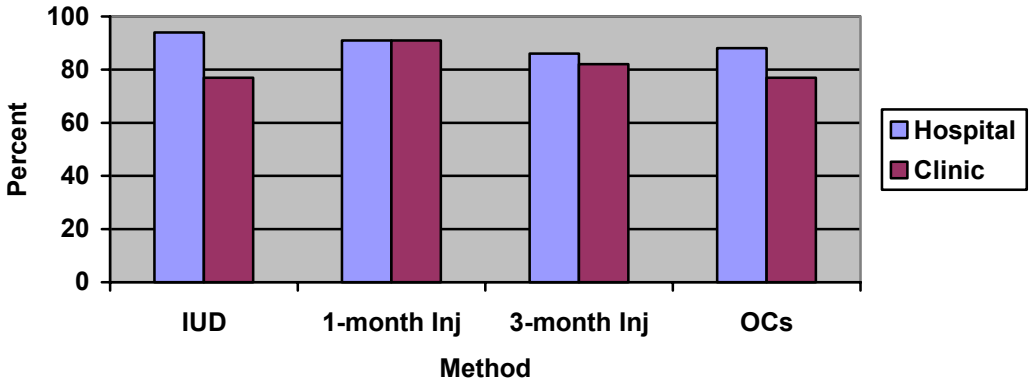


Note: Although socioeconomic characteristics of hospital and clinic clients are very similar, data on demand are presented separately by site because women interviewed at the Hospital Roosevelt for prenatal or childbirth services may have different reproductive health needs than women presenting at clinics for prenatal or pediatrics services. For example, hospital clients may have been referred because of complications, which may affect demand for ultrasound services or preferences for timing of future pregnancies.

Willingness to Pay for Temporary Methods

Clients reporting an intention to use a temporary contraceptive method were asked about their willingness to pay for that method (see Figure 2). Overall, willingness-to-pay was high; more than three-quarters of all clients said they would pay the stated fee. Even higher proportions of prospective IUD users at the hospital and one-month injectable users in both sites accepted the proposed fees. Willingness to pay was slightly higher among hospital clients for all methods except for the one-month injectable.

Figure 2: Percent of Prospective Users of Temporary Methods Willing to Pay Commodity Cost*, by Method and Interview Site



Notes: prices included the cost of the commodity plus an estimate of cost of disposable supplies: IUDs - US$1.92; 1-month and 3-month injectable - US$1.28 per injection; oral contraceptives – US$0.38 per cycle.

Willingness to Pay and Demand for Tubal Ligation

From the perspective of RHU sustainability, tubal ligation and ultrasound are two procedures with great potential for increasing RHU revenue. Demand for tubal ligation derives from two sources: women intending to undergo the procedure in the very near future, and users of temporary methods who plan to undergo the procedure at a later date. In total, 38.6 percent of survey respondents (953 of 2468 women) said they wanted to be sterilized within two years. Table 4 presents information on client willingness to pay different prices for tubal ligation at the RHU. As expected, willingness-to-pay increased as the proposed fee declined: slightly over half of hospital clients and 40.6 percent of clinic clients said they would pay 500 quetzales (US$65), while approximately 85 percent of clients in both sites said they would pay 200 quetzales (US$26). The table also shows that willingness-to-pay specific prices was higher among hospital clients at all queried price points.

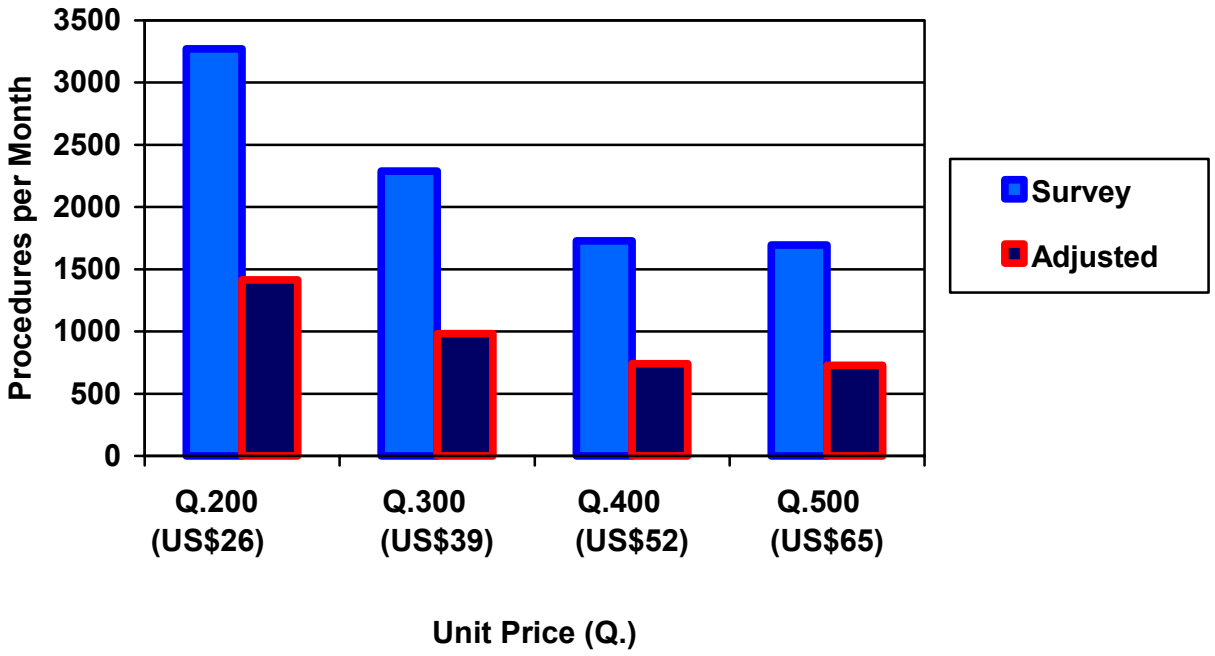
Table 4: Number and Percent of Clients Willing to Pay for Tubal Ligation, by Price and Interview Site

Price Queried	*Interview Site*			
	Hospital		Clinic	
	N	%	N	%
500 quetzales (US$65)	162	53.1	263	40.6
400 quetzales (US$52)	165	54.1	268	41.4
300 quetzales (US$39)	218	71.5	356	54.9
200 quetzales (US$26)	267	87.5	550	84.9
Total	**305**	**100.0**	**648**	**100.0**

If willingness-to-pay in the sample of clients is representative of the larger Hospital Roosevelt population, potential demand for tubal ligation could be enormous. The Hospital Roosevelt health system (including the outlying clinics) serves approximately 10,000 women per month. Projected demand for tubal ligation at different price levels is presented in Figure 3. The lighter bars show monthly demand for the procedure if the overall Hospital population were to exhibit similar patterns of demand as observed in the sample.[3] At a price of 200 quetzales (US$26), approximately 3,300 tubal ligations would be performed each month, while at a higher price of 500 quetzales (US$65), more than 1,700 procedures would be performed.

But it is unlikely that all women who said they wanted tubal ligation (38.6% of survey respondents) actually would obtain the service. Prevalence of female sterilization in Guatemala has steadily increased over the last decade (from 10.3 in 1987 to 14.3 in 1995 to 16.7 in 1999) but is still much lower than the proportion of prospective sterilization clients in the survey. In order to reflect the difference between stated demand and effective demand, we created a lower trendline that uses current prevalence of 16.7 percent to adjust downward the baseline demand for tubal ligation, and then applies the same willingness-to-pay multipliers to estimate total demand at each price. Under these

Figure 3: Two Projections of Potential Demand for Tubal Ligation at Different Price Levels



[3] The lighter bars would represent the absolute maximum demand under the following conditions: each monthly cohort has similar demand and WTP characteristics to the surveyed cohort, and clients cannot be in more than one cohort. Although the second condition is likely violated, the bars do give an approximation of maximum demand.

assumptions, slightly fewer than 1,500 tubal ligations could be performed each month at a price of 200 quetzales, while approximately 750 could be done at a price of 500 quetzales. It should be noted that current capacity at the Hospital Roosevelt is 12 procedures per month, and so demand under the more conservative projection at the highest price point is 63 times the productive capacity of the unit.

Willingness to Pay and Demand for Ultrasound

Prospective ultrasound clients exhibited similar overall patterns of willingness-to-pay (see Table 5). Client acceptance of the current RHU price of 60 quetzales (US$8) for an ultrasound was high; 91.5 percent of hospital clients and 82.4 percent of clinic clients said they would pay this fee. But willingness-to-pay declined rapidly as the queried price increased, even though the interval between queried prices was only US$1.30. This sensitivity to higher prices could indicate the presence of substitute providers, where RHU clients know they can obtain ultrasound services at lower prices. Finally, a larger proportion of Hospital clients accepted each queried price point.

Table 5: Client Willingness to Pay for Ultrasound, by Interview Site

Price Queried	*Interview Site*			
	Hospital		**Clinic**	
	N	**%**	**N**	**%**
100 quetzales (US$12.98)	97	29.6	232	23.6
80 quetzales (US$10.40)	206	62.8	438	44.6
70 quetzales (US$9.09)	233	71.0	565	57.6
60 quetzales (US$7.79)	300	91.5	808	82.4
Total	**328**	**100.0**	**981**	**100.0**

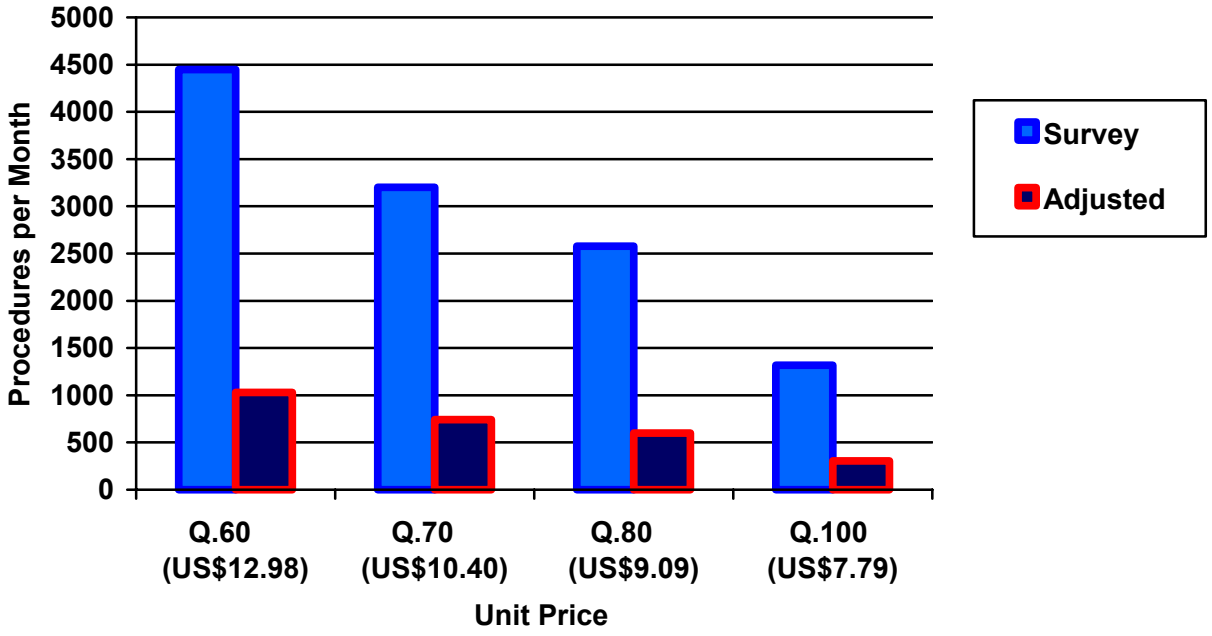
Figure 4 presents two projections of demand for ultrasound at various unit prices. The taller bars in Figure 4 show monthly demand for ultrasound if *all clients* of the Hospital Roosevelt system sought services in the same proportions as the stated intentions of the sample of survey respondents.[4] At the current price of 60 quetzales (US$7.79), approximately 4,500 ultrasounds would be performed each month, while at a higher price of 100 quetzales (US$12.98), more than 1,400 procedures would be performed.

As with tubal ligation, it is highly likely that stated demand for ultrasound diverges from actual effective demand. The RHU has managed to produce an average of 280 ultrasounds per month with minimal promotion of the service outside of the immediate Hospital area.

[4] Client familiarity with the ultrasound procedure was the criterion used to construct the sub-group of respondents for the ultrasound WTP module. This criterion casts a much wider net than the one used for tubal ligation, and overestimates potential demand because it does not include the "intent to use" dimension. Given that ultrasound usually is a diagnostic rather than an elective procedure, however, it made little sense to ask "within the next two years, do you plan to have an ultrasound?"

But it is unlikely that output would skyrocket to 4,500 procedures per month if all prospective clients in the Hospital Roosevelt system knew of the service. To provide a more conservative estimate of effective demand, we used the current rate of ultrasounds among Hospital clients only (10.4%) to adjust downward the baseline estimate of potential ultrasound clients; then, we applied the same willingness-to-pay multipliers to estimate total demand at each price. Under these assumptions, approximately 1,000 ultrasounds would be demanded each month at a price of 60 quetzales, while slightly fewer than 400 would be demanded at a price of 100 quetzales.

Figure 4: Two Projections of Potential Demand for Ultrasound at Different Price Levels



Current ultrasound capacity at the RHU is estimated at 400 procedures per month.[5] Thus, under this more conservative projection, only at the highest price point of 100 quetzales does demand drop below the maximum productive capacity of 400 ultrasounds.

Current Revenue Generation and Alternate Scenarios

As shown in Table 6, surgical procedures and ultrasound currently generate nearly all RHU revenues. No fees are charged for outpatient consultations or pap smears (such fees are considered politically infeasible), although, considering the volume of these services, even a

[5] Capacity estimate of RHU chief: assumes 5 procedures per hour, four hours per day, 20 days per month.

modest consultation fee could produce a substantial revenue stream.[6] Total monthly revenue is US$5,348, which is far higher than the RHU monthly financial need of US$2,986. Therefore, the RHU already has achieved its goal of self-financing the monthly expenditures for which it is responsible. Excess revenue is retained by the *Patronato*, which uses it to finance services in other Hospital departments.

Table 6: Current Output, Unit Prices and Monthly Revenues Earned from Sales of Revenue-Generating Services

Service	*Current Output (avg. Feb-Sept 2000)*	*Unit Price (US$)*	*Monthly Revenue (US$)*
Consult – Temp Method	936	0	0
Pap smear	69	0	0
Colposcopy	1	20	20
Ultrasound	280	8	2240
Hysterectomy	4	260	1040
Diagnostic Laparascopy	4	260	1040
Tubal Ligation	12	84	1008
Total			**5348**

Unit prices of RHU surgical procedures are high relative to client economic status; for example, the fee for either hysterectomy or diagnostic laparoscopy (US$260) would consume more than one and a half months of median household income. But anecdotal evidence suggests that clients receiving these services at the RHU belong to the upper extreme of the economic distribution, and are able and willing to pay fees that are actually much lower than prices they would face in the private commercial sector.[7] Low monthly output of these two services does not concern RHU officials, because there is limited demand among public-sector clients; but income from these services accounts for an important share of RHU revenues.[8]

A valid question is whether the Hospital and the MSPAS will, over the long run, maintain current levels of subsidy to the RHU. The current government of Guatemala has made several public pronouncements emphasizing the need to reduce public expenditure; therefore, the probability of budget cuts is high at the Hospital Roosevelt and the MSPAS. Given that

[6] For example, a fee of 3Q (US$0.39) for consultations and pap smears could generate monthly revenues of approximately 3000Q (US$390), or nearly 40 percent of the revenue currently generated by tubal ligation.
[7] We obtained the following prices for RH services from a convenience sample of commercial-sector providers in Guatemala City. Ultrasound: US$14 – US$43; Tubal Ligation: US$325 – US$650; Hysterectomy: US$450 – US$1040; Diagnostic Laparoscopy: US$580 – US$1170.
[8] Clients that cannot afford to pay the RHU fee are attended according to normal hospital procedures, but may experience a delay in receiving services because of the backlog of patients awaiting intervention.

the RHU is already more than covering its assigned it is possible that the RHU will be asked to cover a larger share of overall costs. For the purposes of the following scenarios, we assume that the RHU will cover the entire cost of personnel, and will continue to pay for ultrasound maintenance, a total of US$5,241 per month.

Scenario 1: Potential for Increasing Revenues from Ultrasound Services

Ultrasound is the single largest source of RHU revenue, contributing 42 percent of monthly income. RHU officials estimate that the ultrasound service currently operates at approximately 70 percent of full capacity (280 procedures per month / 400 potential procedures per month). The most conservative estimate of ultrasound demand (see Figure 4) indicates that far more than 1000 procedures could be performed per month at a price of 60 quetzales. Therefore, it should be feasible for the RHU to boost ultrasound production. If full capacity were reached, monthly income would increase from US$2,240 to US$3,200, assuming a unit price of 60Q.

Scenario 2: Potential for Increasing Output of Tubal Ligation

The key issue related to tubal ligation is how to increase RHU capacity to perform the procedure. RHU officials are dissatisfied (for obvious reasons) with current output of 12 procedures per month. Production of all surgical procedures at the RHU is constrained by limited access to operating rooms (ultrasounds are performed in a dedicated room within the RHU, and so are not subject to this constraint). RHU surgeons are allotted 32 hours of operating room time per month, which is just enough time to attend the current caseload of diagnostic laparoscopy, hysterectomy and tubal ligation. In order to generate enough revenue to cover estimated financial needs, the unit price for tubal ligation has been set provisionally at 650 quetzales (US$84), considerably higher than the price charged by APROFAM, the RHU's main competition in Guatemala City. But demand for tubal ligation at the RHU has been strong in spite of the fact that clients could receive the same service across town at APROFAM for less than half the RHU fee.

Option 1: Hire Dedicated Surgical Team

Since the RHU's revenue needs are mainly met by income from other services, increases in output of tubal ligation can be "revenue-neutral", that is, accompanied by reductions in the price charged to each client.[9] One alternative is to request the Hospital Roosevelt to assign permanently to the RHU the use of a small intervention room[10] in the same area as the RHU. This would enable an increase in capacity from 12 to approximately 80 procedures per month, but would also require the RHU to assign a surgical team exclusively to tubal ligations, since current staff are dividing their time between surgical and outpatient tasks. Specific assumptions of this scenario include the following:

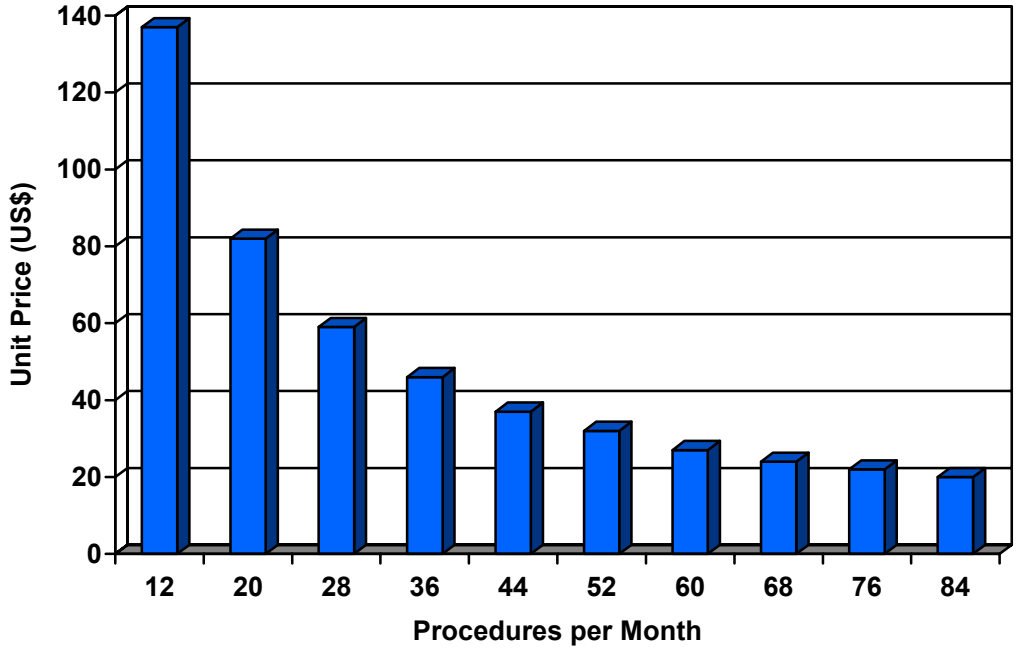
- RHU portion of monthly costs increases to US$5,986 (US$5,241 plus US$745, which represents the monthly personnel cost of adding a dedicated surgical team);

[9] Reducing fees would also help to blunt criticisms that the RHU is denying access to poor women.
[10] This room is not technically an operating room, but has all of the equipment needed to carry out the full range of RHU surgical procedures.

- The Hospital Roosevelt provides the intervention room, additional supplies and medicines at no cost to the RHU;
- Revenue from other procedures remains steady at US$4,340;
- Monthly revenue from tubal ligation fees must be at least US$1,646 (US$5,986 – US$4,340)

Figure 5 shows how unit client fees for tubal ligation could be reduced through higher output, even after factoring in the higher monthly fixed costs of personnel. For example, a modest increase in output to 2.2 clients per day (44 per month) would allow the RHU to reduce the fee to under US$40 per procedure (less than half the current fee of US$84) while continuing to provide the same total revenue to the RHU.

Figure 5: Client Fees for Tubal Ligation at Selected Output Levels: Hire Dedicated Surgical Team



Option 2: Contract Surgical Team on a Per-hour Basis

A second alternative is for the RHU to seek to contract surgical labor on a per-hour basis, and use Hospital Roosevelt operating rooms during the early afternoon (after normal working hours). According to RHU officials, surgical staff at the Hospital Roosevelt would readily accept an "after-hours" opportunity to earn additional money. Staff could be contracted on an hourly basis at somewhat higher hourly rates than usual MOH wages. Specific assumptions of this scenario include the following:

- Hourly wage rate for the surgical team (includes a surgeon, instrument nurse and auxiliary nurse) is US$15.22;

- Surgical team can perform two tubal ligations per hour of operating room time;

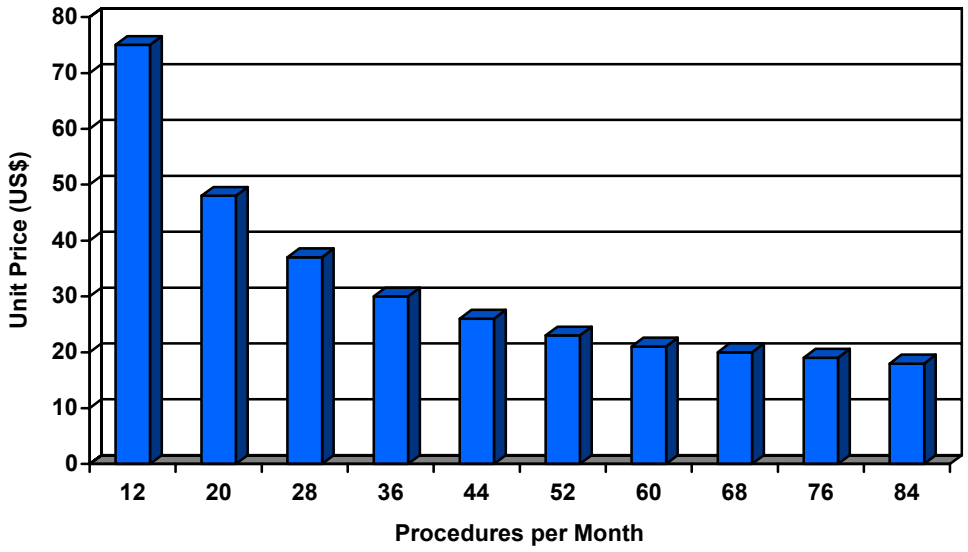
- Revenue target for tubal ligation is US$901 per month (US$5,241 – US$4,340).

This situation is distinct from the previous scenario in that the RHU pays for capacity on an hourly rather than on a monthly basis. The revenue target is lower because there are no fixed costs of a salaried surgical team to defray, but each hour of capacity costs the RHU an additional US$15.22. The formula to calculate the client price at each level of output reflects these differences:

$$P = [RT + (US\$7.61 * Q)] / 12 + Q$$

This formula sets price equal to average total cost. The numerator includes the fixed revenue target (RT), plus the variable labor cost multiplied by the number of procedures done "after-hours"; the denominator is simply the number of procedures done during normal working hours plus the number of after-hours procedures. If, for example, ten after-hours procedures were done, the average cost (and fee charged) would decline to US$44 ([901 + (US$7.61 * 10)] / 12 + 10). Figure 6 depicts graphically several combinations of P and Q, showing how the unit fee would change if output of tubal ligations were increased under these assumptions.[11]

Figure 6: Client Fees for Tubal Ligation at Selected Output Levels: Contract Surgical Staff on a Per-hour Basis



[11] Average cost per procedure would be slightly higher if the RHU performed an odd number of procedures in any given session, because the surgical team is contracted by the hour and the capacity of the team is two procedures per hour.

Over the entire range of output shown, option 2 results in lower unit fees than option 1. This is because the average costs of the dedicated surgical team (option 1) are higher than the variable cost of medical labor per hour (option 2) at each output level. Eventually (at approximately the 94th procedure) costs associated with the two alternatives would be equal, and beyond that point option 1 results in lower costs (and therefore, lower fees).

CONCLUSIONS

Managers of health programs that rely wholly or partially on fee revenue often struggle with the dilemma of how to balance sustainability and social mission. In order to reach revenue objectives, managers can set fees too high, which raises a barrier to access to clients of modest economic means. Setting fees lower will improve access for lower-status clients, but may not result in enough total revenue to meet program needs. Compounding this dilemma is another problem, namely, the absence in many programs of solid information on client characteristics that can inform pricing decisions. In these circumstances, appropriateness of fees can be gauged only after they have been set, when signals such as absence of lower-status clients (fees set too high) or overcrowded clinics (fees set too low) indicate problems.

Prior to this study, the RHU fit the above description. RHU officials had almost no information to support decisions on how fees should be set for RHU services. Uncertainty about underlying economic and financial costs, characteristics of the market for RHU services, and potential demand meant that pricing efforts were essentially guesswork. RHU officials had managed to establish fees that generated more than enough revenue to cover monthly financial obligations, but some of these fees were high enough to create real barriers to access to poor clients.

This study has eliminated much of the uncertainty, providing RHU officials with specific information to support pricing decisions, including the following:

- Magnitude of the monthly "revenue target" (i.e., income needed to cover expenditures for which the RHU is responsible);
- Socioeconomic characteristics and the willingness-to-pay of potential RHU clients attending facilities in the Hospital Roosevelt system;
- Estimates of demand for selected services at different price points, and relationships between potential demand and RHU productive capacity;
- Scenarios demonstrating alternatives for increasing overall RHU income, as well as specific guidance on ways to increase access to tubal ligation while continuing to meet the monthly RHU revenue goal.

Moreover, the study measured overall economic costs of establishing and sustaining a reproductive health unit, information that should be useful to health authorities in other provinces or countries considering making a similar investment.

The most important findings of the study were the following:

- The RHU was already collecting enough fee revenue to more than cover the costs that it was responsible for covering;

- Across the range of prices tested, potential demand for all services was very high, in some cases many times higher than the maximum productive capacity of the RHU;

- Willingness-to-pay also was evident for services that are currently provided for free, such as family planning consultations and pap smears;

The question of replicability of the RHU model is an important one. Several favorable factors – including strong demand for services, a cooperative and supportive hospital administration, international organizations with resources and interest in the RHU, and a policy environment that permitted fee-for-service financing converged in this case to increase the likelihood that the RHU would succeed. Obviously, all of these factors will not be present in all situations. At a minimum, success requires the following conditions: (1) a commitment to the idea of an RHU from all levels of the host institution; (2) a "broker" to guide the initial process of assembling the resources needed to launch the unit; and (3) a careful analysis of the initial and ongoing resource requirements and plans for how these resources will be obtained.