

**Willingness to Pay
For Reproductive Health Services
Among APROFAM Clients
Guatemala**

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SUMMARY

This report presents the results of three studies conducted by APROFAM, the Guatemalan IPPF affiliate, with FRONTIERS assistance.

APROFAM conducted the first study to determine its clients' willingness to pay (WTP) price increases for four services: Depo-Provera, pap-smears, prenatal visits, and gynecological services. The study found that price increases will result in relatively modest increases in program income (\$35,000 - \$45,000) for relatively large (15-20%) reductions in utilization of the three currently subsidized services: gynecology, pap-smears, and prenatal visits. In addition, the survey predicted that price increases for Depo-Provera, the most popular contraceptive provided by APROFAM, would not result in revenue increases. In some cases, as many as 50 percent of respondents were unwilling to pay *any* increase over their current price. These results are startlingly different from those reported in the family planning/reproductive health literature.

A second study was conducted to determine if instrument bias could have contributed to the unexpected findings of the first survey. The WTP survey was repeated in a sub-set of the clinics included in the first survey. Results indicate that high starting prices biased the maximum price clients were willing to pay upwards in the first survey. These findings led us to conclude that the findings in the first survey were robust.

APROFAM then conducted a third study in three clinics to determine what impact a 5 Quetzal (\$0.65) price increase would have on utilization for three services: pap smears, gynecology services and prenatal visits. The price increase appeared to produce modest declines in utilization in two of the three clinics, but was estimated to have increased revenues. APROFAM managers will use the results to decide if they will increase the prices of these services.

INTRODUCTION

Because of declining donor support, private, non-profit (PVO) reproductive health programs in Latin America must now generate most of their own income. Prices charged for services and products are an important source of cost recovery. However, little or no guidance is available to PVOs making pricing decisions. Rather than using objective, data-based criteria, most programs base their decisions on impressions about their clients. Program managers do not know if they are unnecessarily subsidizing users by setting prices too low, or denying access to a large proportion of their target population by setting prices too high.

To help programs set prices using data based criteria, FRONTIERS has been experimenting with the use of a relatively simple technique, the willingness to pay (WTP) survey. This technique can be used to predict the effect of price increases on utilization and revenues.

FRONTIERS follows best practice rules to overcome the major sources of bias associated with WTP surveys.¹ FRONTIERS WTP surveys (1) rely on personal interviews; (2) ask respondents about a future hypothetical occurrence rather than a historical event; (3) use three closed-ended questions that elicit the respondents' willingness to pay a specified increment for a service that is familiar to them, followed by an open ended question asking about maximum willingness to pay for the service in question; and, (4) ask respondents about socio-economic and demographic factors that might influence their preferences.

The order of questions is chosen so as not to bias the respondent to give a higher or lower maximum price than s/he really means. Respondents are first asked their willingness to pay a medium price increase. Those who accept a medium increase are asked their willingness to pay a high price increase. Those who do not accept the medium increase are asked about a low price increase. Finally, all respondents are asked their maximum willingness to pay regardless of the price increase accepted.

Aggregating across respondents produces the demand curve, which displays the percentage of respondents willing to pay a range of prices. An individual respondent's willingness to pay a price s/he has not been explicitly asked can be inferred from her/his other responses as follows: (1) all respondents are considered willing to pay the current price; (2) the maximum price willing to pay is either the highest price increase agreed to in the closed questions or the maximum price stated in the open-ended question, whichever is higher; (3) willingness to pay is transitive downward – if a respondent is *willing* to pay a particular price, s/he is considered *willing* to pay any lower price; and (4)

¹ See Portnoy (1994) and Phillips, et al. (1997). The guidelines described here seek to minimize response biases introduced if respondents do not understand the questions, if they cannot answer the questions, if they do not answer truthfully or give answers to please the interviewer, or if they answer “strategically” to influence the study outcome in their favor.

unwillingness to pay is transitive upward – if a respondent is *unwilling* to pay a particular price, s/he is *unwilling* to pay any higher price.

Between 1999 and 2001 *Asociacion Pro-Bienestar del la Familia de Guatemala* (APROFAM), with FRONTIERS assistance, conducted two willingness to pay surveys and a small verification study. The verification study compared predicted and observed changes in client profile and utilization as a result of an increase in the price of three services: pap smears, prenatal visits, and gynecology services.

Program Setting: APROFAM, the International Planned Parenthood Federation (IPPF) affiliate in Guatemala, is the largest provider of family planning and other types of reproductive health services in the country. In 1999, the Demographic and Health Survey (DHS) estimated modern contraceptive use in Guatemala at 31 percent of women in union, ages 15-44. APROFAM serves over 38 percent of all modern method users. The public sector is the second largest provider with 25 percent of the market, followed by for-profit private and commercial sector providers. APROFAM operates programs in all parts of the country. Services are provided through 27 clinics, a small maternity hospital in the capital, and an extensive community based distribution (CBD) program that employs approximately 3,600 volunteer distributors.

APROFAM's social mission is to make reproductive health care services available to all Guatemalans, regardless of income. In 1998, the agency recovered approximately 64 percent of its operating costs, mostly through user fees. APROFAM clinics have a cost-recovery average of over 90 percent and the agency relies on clinic income to cross-subsidize other services such as its rural CBD program. APROFAM's dilemma is to balance equity and institutional sustainability. If the willingness to pay (WTP) technique provides accurate information on the effect of price increases on revenue and utilization, it can provide APROFAM with a decision-making tool that will permit the organization to better balance its need to become more sustainable with its desire to provide services to the poor.

APROFAM was especially concerned about the prices of five services including Depo-Provera injections, female sterilizations, gynecological visits, prenatal visits and pap smears. These are the most important services provided by APROFAM in terms of volume and revenue. Depo-Provera (DMPA) is the most popular contraceptive method provided by the agency. Clinics provide approximately 10,000 doses of DMPA monthly. APROFAM also provides about 400 female sterilizations per month. This is the most costly and highest priced service provided by the organization. Clients make approximately 8,000 gynecological and 2,200 prenatal visits per month, and agency laboratories process almost 10,000 pap smears per month.

Drawing from institutional information about costs, a comparison of net income per service suggests that, of the four services studied, only Depo-Provera is profitable. The net income per service was estimated as the difference between the actual cost and the current price for each service. The following table shows the net income (in Quetzales) for the four services analyzed in this study. This table shows that APROFAM

is breaking even on pap smears, and is losing money on gynecology and prenatal consultations.

Table 1. Net income per service: APROFAM

Service	Net income per service (Q)
Depo-Provera	7
Pap smear	0
Gynecological visit	-7
Prenatal visit	-11

The Studies: The first WTP study was conducted in 18 APROFAM clinics during the period April – July 1999. The results of the first study showed low willingness to pay for increases in the prices of the five principal services. To eliminate the possibility of instrument bias, a second WTP study was conducted among a subset of six of the original 18 clinics between September and November of 1999. Following the second study, which found relatively mild instrument bias, APROFAM examined the impact of price increases on selected services in three rural clinics.

A feature of the three studies was technical assistance to produce in APROFAM the ability to conduct WTP surveys, and other client based studies, without outside assistance. APROFAM staff was trained as interviewers and field-supervisors, learned to use SPSS to analyze survey data, and participated in results dissemination.

STUDY I: A WILLINGNESS TO PAY STUDY IN APROFAM

OBJECTIVES

The specific objectives of the study included:

- To estimate the impact of price increases on clinic revenue and utilization, including client profile;
- To establish the predictive validity of the WTP survey methodology in the APROFAM setting; and
- To institutionalize the ability to use the WTP technique in APROFAM.

METHODOLOGY

The director of the survey was the APROFAM Evaluation Director. The field supervisor was also an APROFAM employee. A local consultant with previous survey experience assisted them. Twelve interviewers were trained and eight were selected to conduct the survey. Two of the selected interviewers were APROFAM employees. Training of interviewers was conducted during three days prior to beginning fieldwork. The two interviewers working in clinics with a heavily Mayan clientele were native Mayan speakers. FRONTIERS provided APROFAM with a computer to process the survey, along with statistical software (SPSS) and training in its use. All coding, editing and data analysis was done in APROFAM under the direct supervision of the Evaluation Director, who was also responsible for producing the SPSS routines used in the study.

Interviews were conducted during an eight-week period from late April to early July 1999 in 19 of the organization's 26 clinics. In each clinic we attempted to interview the first 100 users, or as many as could be interviewed in a two week period, of each of the following services: DMPA, gynecology, pap smears and prenatal visits. In addition, all interviewees were asked if they were interested in sterilization and how much they would be willing to pay for the intervention.

Individual responses were aggregated to estimate demand and revenue curves. The estimation approach is based on simple cross-tabulations of the maximum price that clients were willing to pay for each service at each clinic.

RESULTS

Interviews completed: We obtained a total sample of 4,856 interviews. This included 1,425 interviews with clients of gynecological consultations, 1,399 Depo-Provera users, 707 attendants to prenatal consultations and 1,325 customers requesting pap smears. The

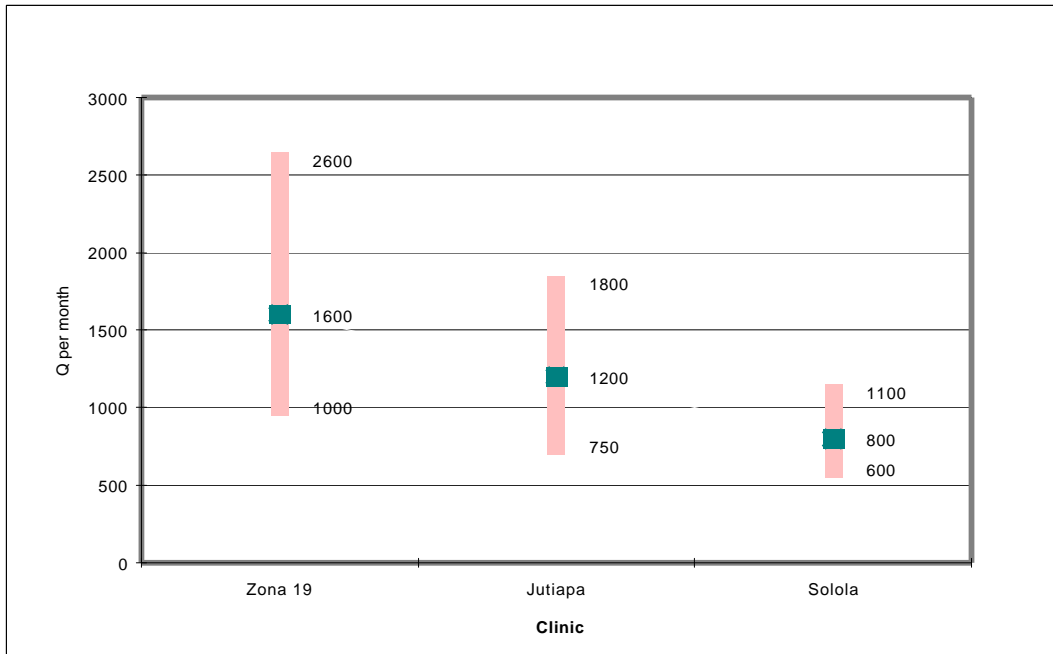
average number of interviews per clinic was 230, with a minimum of 181 and a maximum of 389. In most clinics, interviews of women receiving prenatal services were too few to estimate willingness to pay. Table 2 shows the number of interviews by service and clinic.

Table 2. Number of interviews by service and clinic. APROFAM May-July 1999

CLINIC	Gynecology Services	Depo Provera	Prenatal Visits	Pap Smears	Total
Zona 19	53	101	21	77	252
Zona 12	59	101	28	45	233
Zona 6	57	106	15	74	252
Zona 5	33	81	10	41	165
Zacapa	100	45	46	100	291
Solola	46	45	28	44	163
Chimaltenango	68	100	30	88	286
Huehuetenango	100	61	39		200
Coatepeque	100	69	81	92	342
Quiche	86	66	29	69	250
Jutiapa	100	99	90	100	389
Barberena	91	100	8	101	300
Coban	90	100	91	100	381
Mazatenango	100	79	7	100	286
Quetzalteango	100	82	83	78	343
Escuintla	102	78	63	69	312
Retalhuleu	88	45	12	85	230
Puerto Barrios	52	41	26	62	181
Total	1425	1399	707	1325	4856

Clinic and client profiles: APROFAM provides services to different socio-economic groups. An analysis of income distribution of clients attending each clinic shows an average income of Q1600 monthly in some clinics as compared to Q800 in other clinics, as shown in the following figure. Note that the exchange rate at the time of the study was approximately 7.7 Quetzals per US \$1.00.

Figure 1. Income distribution in three APROFAM clinics. Percentiles 25 to 75



Clinics may be classified into three socio-economic groups: high, medium and low. The socio-economic level of each clinic is estimated by cluster analysis on the basis of the median family income, average years of education, average expenditure on private sector health services in the previous three months and a weighted index of durable goods.

Table 3. Socio-economic level per clinic

<u>High SES</u>	<u>Medium SES</u>	<u>Low SES</u>
Zona 19	Zona 6	Quiche
Zona 12	Zacapa	Coban
Zona 5	Jutiapa	Quetzaltenango
	Escuintla	Chimaltenango
	Puerto Barrios	Coatepeque
		Solola
		Huehuetenango
		Barberena
		Retalhuleu
		Mazatenango

Client WTP price increases: The study indicates low willingness to pay price increases. Overall, the survey suggests that price increases will result in relatively modest increases in program income (\$35,000 - \$45,000) for relatively large (15-20%) reductions in utilization of three currently subsidized services: gynecology, pap-smears, and prenatal

visits. In addition, the survey predicted that price increases for Depo-Provera, the most popular contraceptive provided by APROFAM, would not result in revenue increases. In some clinics and services as many as 50 percent of respondents were unwilling to pay *any* increase over their current price. Table 4 shows the percent of all APROFAM clients unwilling to pay any price increase by type of service.

Table 4. Rejection of any price increase, by type of service (%)

Type of Service	Percentage of Clients Rejecting any Increase in Price	N
Gynecology	20.7	1425
Depo-Provera	20.4	1399
Prenatal Care	12.4	707
Pap smears	13.5	1325

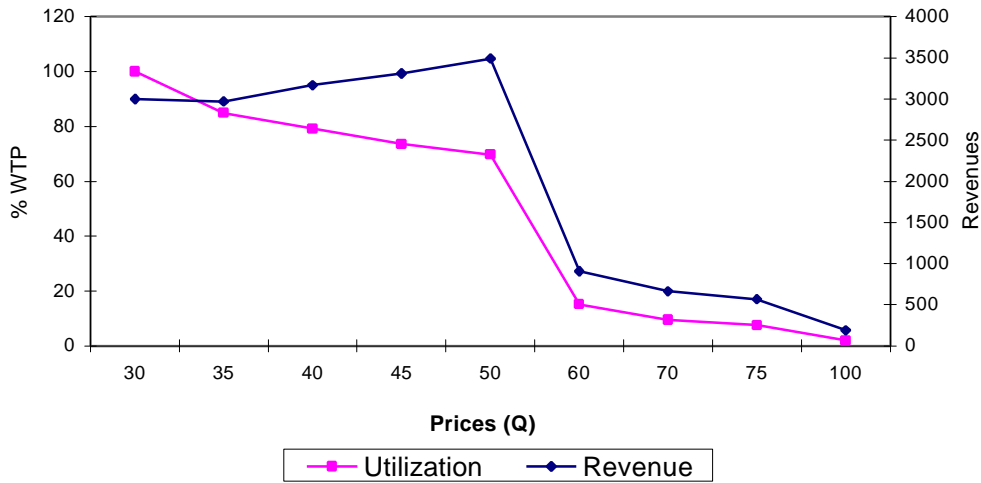
Results show that it is possible to increase total revenue per service without a significant loss of clients (10%) or services provided (volume of services) through increasing prices of some services in nine clinics. This may be seen in the following table.

Table 5. Changes in utilization and revenue as a result of 5Q price increase (\$0.65)

Decrease in services provided (%)	Number of clinics	Increase in monthly total revenues (Q)	Decrease in number of monthly consultations
< 20%	14	26,100	790
< 15%	13	19,000	460
< 10%	9	8,600	105

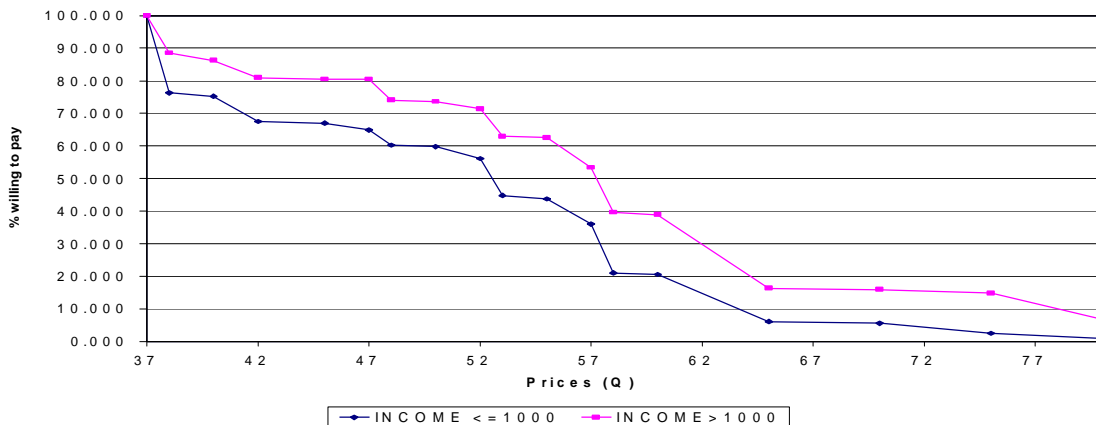
Figure 2 shows the expected volume of services provided depends upon the specific price increase. For clinic Zona 19, the figure shows the total revenues that would be achieved under each price regime. The left-hand axis shows the demand or volume of services provided for each price, and the right-hand axis shows the total revenues that are implied by each price regime. For example, the volume of Depo-Provera services would be reduced by 10 percent if the price were increased from 30Q to 35Q. However, as shown by the upper curve, total revenues increase significantly with such a price increase. The administrative question for APROFAM is: to what extent is a decrease in demand or volume of services justified by an increase in revenues.

Figure 2. Revenue and Utilization, DepoProvera, Zona 19



Female sterilization was once one of the most important services provided by APROFAM. However, after 1995 the agency began charging for the service on a sliding scale, which ranged from 50 – 300Q and the number of procedures performed began to fall dramatically. APROFAM wished to learn the impact of shifting the scale upward to provide more revenue for the service. Using the same methodology described above, we interviewed users of other contraceptives who stated they were interested in using female sterilization in the next two years. We estimate that the price that would maximize APROFAM’s VSC revenues would be Q200; the price that would maximize the number of services provided would be Q100. These estimations need to be compared with the average VSC cost of Q296 per client.

Figure 3. WILLINGNESS TO PAY BY MONTHLY INCOME LEVEL



Factors influencing willingness to pay: Two factors influencing WTP were identified in the analysis of the data: (1) variation between clinics, and (2) client income. There is great variation between clinics in WTP, something not seen in Ecuador. For example, in Clinic 19, all respondents agreed to pay a higher price for Depo-Provera. Data for pap smears is similar, with virtually all respondents in some clinics accepting higher prices, and only about 70 percent accepting any increase in others.

As shown in Figure 3 above, clients with higher incomes display greater willingness to pay than clients with lower incomes. We compared women who said income was received on a daily basis with those who said income was received on a weekly, bi-weekly or monthly basis. We assume that persons who are paid on a daily basis are poorer than those paid on a less frequent basis. Overall, 80 percent of those paid on a "regular" (weekly, monthly) basis are willing to pay more for Depo-Provera (range 62-100%) compared to those paid on an "irregular" (daily) basis (range 2-49%). However, there is little correspondence between ability to pay and the prices currently charged by clinics. Some of the highest priced clinics have mostly poor clients.

Alternative Service Sources: Survey results show that client preferences for alternative sources vary by type of service. This is shown in the following table, where it may be seen that a higher percentage of prenatal clients indicate that they would seek these services from another source, as compared to pap clients, who are more likely to say that they would not seek an alternative source or did not know of one.

Table 5. Alternative sources that women would utilize if APROFAM prices increased beyond their ability to pay (%)

Service	MSPAS	Private doctor	Other	None	Don't know	Total
Gynecology	41	15	4	23	17	100
Prenatal	50	16	7	13	14	100
Pap smear	32	8	4	32	24	100

Survey results show that approximately two-fifths of Depo-Provera clients would continue using the method but would seek alternative sources of supply. Within this group, most would attend MSPAS facilities. An additional two-fifths would change to a different method or stop using contraception altogether. The remaining clients are uncertain about their use of Depo-Provera or another method in the future.

DISCUSSION

Two of the three objectives of the study were met: 1) a willingness to pay survey was successfully conducted which was used to predict the impact of price increases on clinic revenues and utilization; and 2) APROFAM staff received training and survey experience. However, the predictive validity of the WTP instrument was not tested because APROFAM management and board were split on the issues of price increases.

Survey predictions that price increases would have only a minor effect on revenue also contributed to unwillingness to test price increases in the field. It was agreed to delay examining the predictive validity of the instrument until an evaluation of possible instrument bias was completed.

Overall, the study suggested that price increases will result in relatively modest increases in program income (\$35,000 - \$45,000) for relatively large (15-20%) reductions in utilization of three currently subsidized services: gynecology, pap tests, and prenatal services. It was estimated that only a few clinics would experience low client loss for pap tests, gynecology, and prenatal care services if prices were increased. In addition, the survey predicted that any price increase for Depo-Provera, the most popular contraceptive provided by APROFAM, would not result in revenue increases. In some clinics and services as many as half of respondents were unwilling to pay any increase over their current price.

These results are startlingly different from those reported in the FP/RH literature. There are two plausible explanations for the APROFAM findings:

1. The results accurately represent an atypical situation where agency clients are not accustomed to price increases, where current prices are relatively high, and where the population is relatively poor.
2. The level of the initial price increase tested biased the results. The WTP questionnaire asked about willingness to pay three price increases: 15Q, 10Q, and 20Q. These were followed by an open-ended question: "What is the highest price you would be willing to pay for your current service?" The fixed amounts represent increases of 30-67 percent over current service price levels. It is possible that the high prices quoted in the first three questions influenced the final, open-ended response by biasing it (and WTP in general) downward.

APROFAM decided to delay the originally proposed validation experiment until the reliability of the WTP instrument could be checked in a second survey. Consequently, a second survey with lower prices was planned for a sub-set of the clinics where the first study was conducted.

STUDY II: AN EVALUATION OF WTP SURVEY INSTRUMENT BIAS

OBJECTIVES

The general objective of this study was to determine the extent to which instrument bias influenced the unanticipated results of the first APROFAM willingness to pay (WTP) survey. To make this determination it was necessary to conduct a second WTP study in APROFAM in a sub-set of the clinics included in the first study. The specific objectives of this study included:

- To determine the effect of the level of the initial WTP price increment in the survey instrument on maximum willingness to pay; and
- To determine the effect of the position of a price in the WTP question sequence on willingness to pay a given price (e.g. Is a client more or less willing to pay a given price if it is asked as the medium, low or high price?).

METHODOLOGY

Hypotheses: The study tested two hypotheses: (1) lower starting prices will result in higher WTP in the study population; and (2) willingness to pay a given price increase will be affected by the position of that price (initial, low, or high) in the sequence of price questions.

Survey Methodology: A sub-set of six clinics included in the first study was purposively selected for the second study. They included two clinics with a predominantly indigenous (Mayan) clientele, two with a primarily Ladino (Spanish speaking) clientele and two large urban clinics in Guatemala City. Clients were selected using the same exit interview-sampling plan as that of the first study. All clients requesting either Depo-Provera, gynecology, prenatal or pap smear services during a two-week period or until 100 cases per service were interviewed, whichever came first. With one exception, the interviewers in the second survey were the same as those in the first survey. The same instrument was used in both surveys with the exception of the fact that the closed ended willingness to pay questions started at a lower level and covered a lower price range than in the first survey. The following table shows the overlapping price ranges tested in each survey.

Table 6. Overlapping price increases by survey (in Quetzals)

SERVICE	SURVEY 1			SURVEY 2		
	Start	High	Low	Start	High	Low
Depo-Provera Injection	15	20	10	10	15	5
Gynecological Consultation	15	20	10	10	15	5
Prenatal Visit	10	15	5	5	10	3
Pap Smear	10	15	5	5	10	3

\$1 USD = Approx 7.7 Quetzals

The APROFAM Evaluation Director was in charge of the second survey, and conducted the fieldwork without the assistance of a consultant. All editing and coding was done by APROFAM, as were the preliminary data analyses.

RESULTS

A total of 1,827 women were interviewed, an average of approximately 300 women per clinic or 76 per service were interviewed. Table 7 compares respondent characteristics for the two surveys.

Table 7. Comparison of selected sample indicators by survey

Indicator	Survey 1	N	Survey 2	N
Age	29.9	1777	29.6	1826
Number of Children	3.0	1621	3.0	1620
Years of Education*	5.0	1777	5.8	1798
Index of Belongings	1.26	1777	1.30	1823
Monthly Income	1458	1504	1544	1746

* $p < .001$

Only one significant difference in indicators occurred between surveys. Respondents in the second survey had a mean of 0.8 more years of education than in the first survey. These results indicate that the two survey samples are highly comparable.

Differences in WTP: The mean maximum WTP declined slightly for all four types of consultations. The direction of these differences was opposite those hypothesized. Because the different clinics served different populations and charged different prices for the same services, we considered each clinic-service combination as an independent replication of instrument bias, rather than pooling client responses. We conducted two tests: 1) mean maximum price willing to pay, and 2) probability of accepting a given price increase relative to its position in the probed price range. Data from one of the six clinics, Chimaltenango, was eliminated from the analysis because it was discovered that the clinic had undergone renovation during the period between surveys, and there was concern that the improvement in amenities could have influenced client WTP.

The hypothesis of instrument bias predicts that the first survey would show higher maximum price willing to pay and higher willingness to accept a given price increase (when it was relatively lower in the probed price range). With 20 independent replications, we would expect approximately one statistically reliable comparison by chance.

Comparing the mean maximum price willing to pay between the first and second surveys for each service and clinic yields 20 independent replications. Of the 20 replications, 17 were in the direction of starting point bias (i.e. the first survey showed a higher mean than the second), of which 10 comparisons were statistically significant ($p < .05$) and another two were marginally reliable ($p < .10$). In the remaining three replications, the second survey produced a higher mean than the first, and one of these comparisons was statistically reliable. Overall, the magnitude of the price differences was small, averaging less than US\$1.00, an amount not programmatically important.

Demand curves (not shown) were drawn for the clinics included in both surveys. Regardless of the survey, none of the revenue curves show potential for substantial revenue growth resulting from a price increase (the sole exception is gynecological services in the two clinics with a low base price).

As can be seen in Table 6, the surveys included two identical price probes for each service. For example, users of prenatal services were presented with a 5 Quetzal price increase as the initial probe in the second survey and as the low probe in the first survey, while a 10 Quetzal price increase served as the initial probe in the first survey and as the high probe in the second. This produced 40 independent replications of instrument bias (5 clinics x 4 services x 2 price increases). In 30 of the 40 replications, clients were more likely to accept the price increase when it was relatively lower in the price range (i.e., in survey 1); four of these replications were statistically significant and an additional six were marginally reliable. In the remaining 10 replications, clients were equally likely to accept the price increase in both conditions or more likely to accept it in the second survey; of these 10 cases, 1 was statistically reliable.

Taken together these two tests demonstrate consistent but weak instrument bias, with higher price probes producing slightly higher demand throughout the price range and somewhat higher maximum price willing to pay.

DISCUSSION

Evidence of instrument bias was found, but the bias was not of sufficient magnitude to question the reliability of the willingness to pay technique in general, or the first APROFAM survey in particular. Contrary to our first hypothesis, it was found that a higher price range produced a higher maximum WTP than a lower price range. However, our second hypothesis that WTP a given price was influenced by the position of that price in the question sequence was confirmed. A given price increment was more likely to be

accepted when it was in a lower rather than a higher position in the sequence. Both of these findings have methodological implications. Investigators need to be aware that even small differences in price ranges result in biasing the WTP instrument. However, the practical significance of this is low in price setting situations because we are concerned with WTP a target price and not a maximum price. However, in cost-benefit applications of the WTP methodology where maximum willingness to pay is the variable of interest, such bias may have an important influence on study results.

The implication of position bias for price setting applications is clear. Target prices should be placed as the medium or low price increment rather than high increment in the closed-ended question sequence. We speculate that position bias exists because many respondents may treat the WTP questions as a bargaining situation.

Although the results of this study support the conclusion that APROFAM clients indeed are resistant to price increases in reproductive health services, it is important to point out that WTP surveys measure clients' stated intentions to price increases. Actual behavior in response to a price increase could be very different. Therefore we continued to recommend that APROFAM test the predictive validity of the first survey by increasing prices in a sample of clinics.

STUDY III: PILOT TEST OF A PRICE INCREASE FOR THREE SERVICES

OBJECTIVES

Study three had a single objective, to pre-test the impact of a five Quetzal price increase (about \$0.65 U.S.) on the utilization of three services: pap tests, prenatal and gynecology visits.

METHODOLOGY

Three clinics with high willingness to pay for the three services were purposively selected for the study. In one of the clinics, Jutiapa, the prices of prenatal and gynecology visits were increased by 5Q. In the other two clinics, Chimaltenango and Coatepeque, the price of a single service, pap tests, was increased by 5Q. In Jutiapa, the price increase occurred in April 2000. In Chimaltenango and Coatepeque, prices were increased in March 2000. Service statistics on the number of visits pre- and post-price increase were compared. To control for seasonality (data from 1998-1999 indicated that utilization increased during the second quarter, compared to the first quarter) the three months following the 2000 price increase were compared with the same three months of 1999.

RESULTS

The table below shows the results of the price increases in the three clinics. The table compares the mean monthly visits in the same trimester in 1999 and 2000. The final column of the table shows the difference in utilization between the two periods.

Table 8. Change in utilization between 1999 and 2000

Clinic and Service	Mean Monthly Visits April-June 1999	Mean Monthly Visits April-June 2000	Observed Difference	Predicted Difference
Jutiapa <i>Gynecology</i>	384.3	360.0	-6.3%	-14%
Jutiapa <i>Prenatal</i>	262.7	247.3	-5.8%	-16%
	March-May 1999	March-May 2000	Observed Difference	Predicted Difference
Chimaltenango <i>Pap smear</i>	262.3	245.3	-6.5%	-19%
Coatepeque <i>Pap smear</i>	988.0	1072.0	+8.5%	-23%

Small utilization declines are found in two of the three clinics. In the third clinic, pap smear visits increased by over 8 percent. Small sample size precludes drawing a firm

conclusion. The observed changes may not be reliable, but it appears that the price increase may have caused a small decrease in visits in two clinics for all three services. Assuming that the observed changes are reliable, estimated increases in clinic income are approximately 17 percent in Jutiapa and Chimaltínango and 36 percent in Coatepeque.

DISCUSSION

Based on the small amount of evidence available, it appears that a price increase of 5Q for pap smears, prenatal services and gynecology visits will result in minimal client loss and will increase clinic revenues. The recommendation is made to increase prices by 5Q.

FRONTIERS had included a study of the predictive validity of the WTP survey technique in the original proposal, but the small number of clinics involved in the price increase precludes this analysis in any formal way. To be programmatically useful, we define predictive validity as allowing the program manager to make better predictions of future, post-price increase client behavior. Conservative tests of predictive validity include hierarchical multiple regression, first entering two routine program data (baseline clinic volume and amount of price increase) and then the WTP prediction. The technique requires the dependent variable to contain at least two price increase levels, which is not the case in the present study. A second test analyzes how closely predicted utilization behavior simulates observed behavior, by comparing observed and predicted percent change. Variation in starting prices, price increases and clinic client profiles require that this analysis be made utilizing multiple replications by clinic and service. This condition was also not present in the current study. Although a large number of replications were not possible, it should be noted that the results of the predictive validity comparisons for the three clinics and services was consistent with that found in the only test of predictive validity, the CEMOPLAF study conducted in 1998. In that study we found that predicted utilization was within 10 percent of observed utilization in approximately 50 percent of cases. Moreover, predicted declines in utilization were greater than observed declines in approximately 70 percent of cases. In the present study, in two of the four comparisons predicted utilization was within 8 points in one comparison, within 11 percentage points in a second and was more than 13 percent in the remaining two comparisons. The survey over-predicted declines in all cases.

Based on these results, we tentatively suggest that a manager using WTP predictions to make a pricing decision should assume that true client loss will average 10 points less than predicted loss, and that revenues will be correspondingly higher than predicted by the survey. The WTP survey is useful because of the systematic nature of its prediction error rather than for its absolute accuracy. A conservative manager is also advised to conduct a brief, small scale pricing trial in a few service delivery points prior to a program-wide price increase.

IMPACT AND UTILIZATION OF THE RESEARCH

At the time of final report preparation, WTP results had not been used in program decision-making, except in the sense that it was decided to delay a price change decision until the reliability of the information provided by the surveys could be examined. However, the agency did conduct a WTP survey in collaboration with the Population Council Guatemala office prior to the introduction of NORPLANT in agency clinics. Information from this survey was used to set the price of the product at 90 Quetzales. In the future APROFAM will include the WTP technique on an as needed basis in routine client satisfaction surveys, whenever pricing decisions need to be made. It is recommended that when using the WTP survey estimate of willingness to pay, decision makers treat the point estimate of utilization decline as the high end of a ten-percentage point range of probable client utilization behavior.

The major local impact of this OR project was to improve the ability of APROFAM to conduct research. Staff members were trained in general survey techniques and data analysis, including questionnaire design, use of SPSS, field supervision, and interviewing. Mastery of the WTP survey technique adds an additional methodology to APROFAM sustainability tools that also include cost analysis, and, recently, client satisfaction surveys. The research also encouraged APROFAM to make use of WTP surveys for making NORPLANT pricing decisions. Importantly, the second survey made an important contribution to our knowledge of the reliability of the WTP methodology and to the scale and nature of some biases in the technique.

DISSEMINATION

APROFAM conducted three dissemination presentations. The first was presented to APROFAM's executive staff on March 26, 2001. Participants praised the study as an important contribution to the establishment of a pricing policy within the organization. APROFAM's executive staff decided to include WTP questions in the exit interviews that are conducted continuously at each clinic. Some recommendations were made to improve the presentation of the final report.

APROFAM also presented a paper on client profile changes predicted by the WTP survey at the Sustainability and Social Mission conference held in Quito Ecuador during May 2001. The conference was sponsored by CEMOPLAF, FRONTIERS and CMS.

Finally, on July 24, 2001, APROFAM presented project results to USAID/Guatemala and several CAs. Fourteen representatives from the major CAs working in Guatemala participated in the meeting, including: the Policy Project, CARE, PCI, PASCA, as well as APROFAM's executive staff and USAID monitors. Zonia Aguilar, the project's Principal Investigator presented the project's objectives, methodology, results and conclusions. Participants discussed the relevance of the WTP methodology and several suggestions were made to institutionalize the use of WTP surveys on a continuous basis and to share APROFAM's experience with other NGOs working in Guatemala.

APPENDIX I: THE RELIABILITY AND THEORETICAL VALIDITY OF THE APROFAM SURVEY

We examined the reliability of the survey instrument by looking at non-response rates for the open-ended question, non-responsiveness (failure to respond to all of the WTP questions) and stating a lower maximum willingness to pay than the highest increment accepted on the closed-ended questions or than the current price paid for the service. Only 2.4 percent of answers to the open-ended question were non-responses. No clients were non-responsive, and no respondents gave maximum WTP responses that were lower than previously accepted prices. Consequently we conclude that survey responses were reliable.

The theoretical validity of an instrument can be measured by the extent to which it yields results that are predicted by economic theory. We defined theoretical validity as the extent to which persons with higher income had higher WTP than persons with lower income. Clients with higher family income show willingness to pay higher price increases as compared to lower income customers.