

Three Strategies to Promote Sustainability of CEMOPLAF Clinics in Ecuador

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The continuing trend of donor attention and resources away from Latin America threatens the sustainability of nongovernmental family planning organizations in that region. Managers can improve sustainability through cost control, cost recovery, and income generation. The Population Council's INOPAL II and INOPAL III projects and Family Health International assisted CEMOPLAF, an Ecuadoran private voluntary organization, in carrying out operations research in each of these areas. Studies included cost-savings analysis from altering IUD revisit norms (cost control), an ability-to-pay study that showed potential gains from increased prices for reproductive health services (cost recovery), and a feasibility study to estimate income from ultrasound services (income generation). Results indicate that any one intervention will probably have a limited impact, and that managers likely will need to undertake several initiatives simultaneously to make significant progress toward sustainability. (STUDIES IN FAMILY PLANNING 1998; 29,1: 58–68)

The cost of meeting future demand for family planning services in developing countries has been the focus of considerable attention in recent years (Janowitz, 1993; UNFPA, 1995). Constraints on public funding for health care together with stagnant or shrinking donor contributions have resulted in a shortfall in resources needed to finance family planning. This “funding gap” has created concerns about the sustainability of family planning programs, particularly about those operated by nongovernmental organizations (NGOs) (Foreit and Levine, 1994; OPTIONS Project, 1993; Haaga and Tsui, 1995).

Although most donors and recipients of donor funding would agree that sustainability is an important issue, no generally accepted definition exists for the term “sustainability.” In the development literature, sustainability is defined broadly or narrowly, depending on the author’s objectives for the analysis. For example, one study describes it in general terms as an organization’s ability

to meet its goals, engage in strategic planning, and develop a diversified funding base (Wolff et al., 1991); a narrower definition emphasizing financial self-reliance is advanced by Haws et al. (1992), whereas Williams (1993) focuses on the ability of specific nongovernmental organizations to replace funding from one important donor. Jensen (1991) argues that sustainability depends greatly on clients’ willingness to pay for products and services, and, therefore, his definition underscores the importance of program income in covering recurrent costs. A report by the staff of the OPTIONS project (1993:2) proposes a broad-based concept of sustainability, defining it as the capacity “to provide current and potential clients with the information and services necessary to obtain the benefits of family planning—on a continuing basis and without external aid.” Under this definition, sustainable programs must possess management capacity that is both effective and responsive to change, ensuring that services and supporting activities have sufficient resources to function over the long run. The condition that programs operate “without external aid” clearly implies self-sufficiency, but the authors recognize that complete independence is a goal that few programs will actually reach. Rather, their intent is to set a high standard that programs can use to measure their progress toward greater financial and managerial autonomy.

Today, many family planning NGOs in Latin Amer-

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ica are struggling with the imperative to become less dependent on donor funding. Until the late 1980s, NGO success was measured largely in terms of how effective an institution was in providing modern contraceptives to poor couples. Services were heavily subsidized or free, and plentiful donor funding helped to create a management culture that tolerated inefficient practices. However, recent developments in the region have called into question whether large donor subsidies to NGOs are justified. Latin America leads the developing world in gains in contraceptive prevalence and reductions in fertility. In many countries, ministries of health have replaced NGOs as the primary source of family planning services for poor women. Oral contraceptives and condoms are often available at subsidized prices through pharmacies and other outlets in the commercial sector. As the rationale for supporting family planning NGOs in some countries has become weaker, donor funding has fallen. During the period 1988–93, resource flows to Latin America declined, and NGOs received a smaller share of those funds (UNFPA, 1994). Donor resources for population assistance increased sharply in 1994 in all regions, but whether this increase signaled a reversal of the previous downward trend or was simply an anomaly is unclear.

In response to actual and predicted declines in subsidies from international donors, many NGOs in Latin America and elsewhere are seeking ways to improve their financial condition. Most sustainability interventions fall within the three categories of cost control, cost recovery, and income generation (also called “diversification”). Strategies of cost control seek to improve financial status by making better use of existing resources. Programs can use techniques such as operations research and cost-effectiveness analysis to identify and propose solutions to situations in which resources are not being fully used (Creese and Parker, 1992). Such interventions may have great potential for reducing costs, but often are difficult to implement because of internal opposition to change. Cost recovery, charging fees for existing services, is an increasingly common way for programs to improve financial status. However, cost recovery is controversial because of concerns that contraceptive use will decline or that poor clients will be denied access to services (UNFPA, 1995). Income generation seeks to identify market niches that a program can exploit in order to earn profits from sales of products or services. Some of the services that programs have attempted to sell at a profit include analysis of pap smears, ultrasound, and laboratory tests (Castro et al., 1991).

Although some NGOs have experimented with these approaches, many others fail to act because of fears about potential negative outcomes, such as loss of poor

clients or erosion of the institution’s social mission. Program managers should evaluate potential interventions both in terms of their contribution to financial sustainability and in terms of their possible impacts (both positive and negative) on access and quality of care. This report reviews results of three sustainability-related operations research (OR) projects, to show how OR can enable managers to predict the financial and programmatic impacts of sustainability interventions. The three studies have the additional advantage of having been conducted at the same NGO at approximately the same time. This feature permits a more direct comparison of the interventions, avoiding the need to correct for differences in program context, such as local economies and market conditions and program size and structure.

Program Setting

Ecuador has registered rapid increases in contraceptive-use prevalence over the past 15 years, from 34 percent of married women in 1979 to 57 percent in 1994. The method mix in 1994 emphasized female sterilization (35 percent of total method use), the intrauterine device (IUD) (21 percent), and oral contraceptives (18 percent). The rest used mainly barrier and traditional methods. Those who undergo female sterilization rely primarily on public-sector providers, whereas the private sector, including private voluntary organizations (PVOs) and commercial establishments, is the main source of all other methods (CEPPR and CDC, 1995).

The Centros Médicos de Orientación y Planificación Familiar (CEMOPLAF) is a private voluntary organization based in Quito, Ecuador. CEMOPLAF operates 20 family planning/reproductive health clinics throughout Ecuador, as well as laboratories, minipharmacies, and community-based distribution (CBD) and social marketing programs. Contraceptive methods provided include the IUD, oral contraceptives, injectables, vaginal tablets, condoms, and male and female sterilization, as well as information about the lactational amenorrhea method (LAM). CEMOPLAF is one of the leading providers of IUDs in urban areas of the *sierra* (the mountainous central region of Ecuador). Other reproductive health-care services include screening and treatment for cervical cancer and sexually transmitted diseases (STDs), pregnancy testing, ultrasound, routine gynecological treatment, pre- and postnatal care, breastfeeding promotion, pediatric services, and some general medicine. In 1995, agency clinics recorded approximately 167,000 client visits, including 86,000 for family planning and 81,000 visits not related to family planning. CEMOPLAF clinics serve mainly urban working-class women, who appear

to have higher socioeconomic status than women who receive services from public-sector providers (Janowitz and Bixby, 1990).

Financial sustainability has always been one of CEMOPLAF's main concerns, and the organization has made substantial progress toward reducing dependence on donors. Until recently, the United States Agency for International Development (USAID)/Ecuador provided much of the funding for capital purchases, central administration, and clinic operating expenses. However, USAID is gradually phasing out assistance to CEMOPLAF and after 1999 will provide only limited commodity support and technical assistance. In response to these changes, CEMOPLAF produced a sustainability strategy that focused on increasing institutional income. Beginning in 1991, the agency conducted several studies to assess different interventions to improve financial sustainability. With technical assistance from the Population Council's INOPAL II project and Family Health International (FHI), CEMOPLAF estimated cost savings from a change in medical norms (cost control), assessed clients' "ability to pay" for reproductive health services (cost recovery), and projected profits earned by expanding ultrasound services (income generation).

Study 1: Impact of a Change in IUD Revisit Norms

Client follow-up is considered an essential element of quality of care (Bruce, 1990). But in the case of IUDs, no clear consensus exists on the number and timing of routine follow-up visits needed to detect and resolve method-related problems (Janowitz et al., 1994). CEMOPLAF, like many other family planning providers in the developing world, has traditionally recommended that women using the IUD for the first time make four scheduled follow-up visits in the first year. CEMOPLAF managers recognized that their revisit norm imposed costs on clients and on the institution; clients spent money and time in order to comply with the four-revisit norm, while the large number of IUD revisits (74 percent of all visits in 1990) contributed to clinic overcrowding and long delays in service. Furthermore, the four-visit norm provided an unknown level of safety for IUD users. Therefore, CEMOPLAF managers decided to carry out a study to model the impact of less stringent IUD follow-up norms on program and client costs and on detection of IUD-related problems (Foreit et al., 1998).

Methods

The study used an analytic model based on signal-de-

tection theory (Coombs et al., 1970). The technique employs a two-way table that relates the probability of an IUD acceptor's having a method-related medical problem to the probability of the acceptor's making a revisit. The model assumes that the underlying probability of an IUD-related problem is constant, but that programs can influence the probability of revisits through revisit norms. The probability of making a revisit is conditioned by the "payoffs" (perceived costs and benefits from the perspective of the client and of the program) of four possible outcomes: (1) the client has a problem and she revisits the clinic; (2) she has a problem and she does not revisit; (3) she does not have a problem and she revisits; and (4) she does not have a problem and she does not revisit. From CEMOPLAF's perspective, outcomes (1) and (4) are beneficial to clients and the program, whereas outcomes (2) and (3) are undesirable; outcome (2) fails to detect method-related problems, and outcome (3) imposes needless costs on the program and on clients.

The study used data from several sources. First-year revisit rates for IUD acceptors were calculated from clinic records. Interviews with 4,985 IUD acceptors returning for follow-up visits provided information on first-year problem rates among IUD users. The likelihood of returning without a routine appointment was obtained from the client interview. IUD-related problems (minor and serious) detected at follow-up visits were documented by clinicians using a form completed at each revisit. Clients were classified as having a serious method-related problem if they presented with suspected pelvic inflammatory disease (PID), suspected pregnancy, or IUD expulsion. Estimates of costs to CEMOPLAF and to clients were based on accounting records and data from the client interview. These data were used to compare the current four-visit norm with two alternative revisit schemes: a one-visit norm, with other revisits optional for clients with problems or questions; and an all-revisits-optional norm, which maximizes cost savings.

Results

As expected, the model showed that the probability of detecting serious medical problems declines as clients make fewer follow-up visits. CEMOPLAF's current norm detected the most problems, and the all-revisits-optional norm detected the fewest. However, most clients with problems said that they would have sought treatment even without a scheduled appointment. Thus, as shown in Table 1, reducing the number of required follow-up visits from four to one would result in 8,300 (36 percent) fewer IUD revisits, but would detect only 55 (7 percent) fewer serious medical problems (based on CEMOPLAF's approximately 10,000 IUD insertions performed in 1993).

Table 1 Comparison of three IUD norms: revisits, method-related problems detected, and costs per 10,000 insertions, CEMOPLAF, Ecuador

Norm	Outcomes				
	Revisits	Problems detected	Annual costs (US\$)		
			Agency	Client	Total
4 required revisits	23,100	582	\$28,000	\$64,000	\$92,000
1 required revisit	14,800	527	\$18,000	\$41,000	\$59,000
All revisits optional	8,300	432	\$10,000	\$23,000	\$33,000

Adopting the all-revisits-optional norm would result in the detection of 26 percent fewer serious problems, or 150 such problems per 10,000 insertions.

CEMOPLAF's net cost (cost to agency minus client's fee) per IUD revisit was estimated at US\$1.21 (here and below, amounts are given in 1993 US dollars), and included financial costs of materials and supplies, as well as opportunity costs of clinic staff, clinic fixed capacity (equipment and space), and overhead. Clients' costs were estimated at \$2.78 per visit, including cash payments for transportation and clinic fees, and opportunity costs of time spent at the clinic and in transit. As shown in the table, CEMOPLAF would save approximately \$10,000 and clients as a group would save \$23,000 if the one-revisit norm were adopted; savings would be even greater under the all-revisits-optional norm. Savings would be partially offset by the cost of treating IUD-related problems missed under the new norm. Benefits would also accrue, however, because more new clients could be served in the clinics. No additional costs or benefits were calculated.

Policy Change and Outcomes

CEMOPLAF adopted the one-revisit norm in the first quarter of 1993. The impact on revisit patterns was measured by comparing service statistics for the four quarters of 1992 with the four quarters of 1993. The impact on volume of revisits was almost immediate; although the mean number of insertions per quarter remained the same between 1992 and 1993, mean quarterly revisits declined by 29 percent (from 778 per clinic to 553 per clinic) after changing the norm. In annual terms, revisits declined from a total of 62,240 in 1992 to 44,240 in 1993 and 40,948 in 1994.

The economic impact of the one-revisit norm was less dramatic. Much of the decline in IUD follow-up visits was counterbalanced by an increase in gynecological consultations (see Table 2). Gynecological and IUD visits are similar in content and duration, and the fixed resources (that is, staff, equipment, and infrastructure) made available by the change in norms were quickly reallocated to serve other clients. Replacing IUD revisits

Table 2 Changes in margin earned from IUD revisits and other non-family planning consultations, CEMOPLAF, Ecuador, 1992–93

Year/ type of visit	Total visits	Margin per visit (US\$)	Total margin (US\$)
1992			
IUD revisits	62,240	0.36	\$22,406
Non-FP consultations	73,200	0.95	\$69,540
Total	135,440	—	\$91,946
1993			
IUD revisits	44,240	0.36	\$15,926
Non-FP consultations	89,662	0.95	\$85,179
Total	133,902	—	\$101,105
Change in margin	—	—	\$9,159

— = Not applicable.

Note: Margin is calculated by subtracting per-unit variable costs from per-unit revenue.

with gynecological consultations resulted in a financial gain, however, because each visit returned a higher margin to CEMOPLAF than did the IUD revisits. (Margin is calculated by subtracting per-unit variable costs from per-unit revenue.) For example, each IUD revisit earned \$0.70 in revenue and incurred \$0.34 in variable costs, yielding a margin of \$0.36, compared with a margin of \$0.95 from gynecological visits (with a revenue of \$1.06 and variable costs of \$0.11). Therefore, as shown in the table, the substitution of gynecological consultations for IUD revisits resulted in a net financial gain of \$9,159.

Benefits of the new norm also extended to most IUD acceptors, who avoided the costs associated with visits that were not medically necessary. The decline of 18,000 revisits between 1992 and 1993 can be seen as client acceptance of the less-stringent norm for IUD follow-up care. Although the estimated client-cost savings of \$2.78 per visit may seem insignificant by standards elsewhere, it represents almost five hours' pay at Ecuador's official minimum wage.

Interpretation of the new norm's impact on access and quality of care depends on how various outcomes are valued. Clearly, access to CEMOPLAF clinics increased; by a conservative estimate, the change in norms liberated a total of 1,800 hours of provider time (18,000 fewer IUD revisits multiplied by six minutes per visit). This increased service availability did not result in larger numbers of family planning acceptors, as many in the agency had hoped. Rather, CEMOPLAF served more gynecology clients, which improved the agency's financial status but did not contribute to CEMOPLAF's original mission of meeting the contraceptive needs of poor couples.

Likewise, the impact of the new norm on quality of care is ambiguous. Concerns about the safety implications of undetected problems must be balanced against the need to use limited clinical resources effectively. Although some might argue that family planning pro-

grams should do everything possible to detect and correct method-related problems, such an approach would result in unacceptably high costs to programs and users and would divert resources that could be used to serve additional clients. Moreover, less-stringent norms may be sufficient to detect serious problems such as pelvic inflammatory disease (PID). A recent study in Mexico found that a two-revisit norm was as effective as a four-revisit norm in detecting lower genital tract infections that commonly precede PID (Hubacher, 1996). Therefore, although the definition of an acceptable threshold of missed problems will continue to provoke debate, programs seek practical guidance to help them understand the tradeoffs between access, quality, and costs.

Study 2: Assessment of Clients' Ability to Pay

Fees charged to clients are an important source of funds for CEMOPLAF. In 1993, the agency used fee revenues to finance 72 percent of direct program expenditures, while foreign donors (mainly USAID) paid for the remainder of direct costs and CEMOPLAF's administrative overhead. Although raising prices would seem to be a straightforward way to improve sustainability, evidence from the developing world suggests that price increases can lead to sharp reductions in the demand for services (Janowitz and Bratt, 1996). Attempts to increase fees will succeed only if clients are willing and able to pay for family planning and related health services. However, few programs routinely collect such information. CEMOPLAF managers were interested in assessing clients' economic status in order to inform decisions about the pricing of products and services (Bratt et al., 1995).

Methods

A survey was conducted among clients visiting CEMOPLAF clinics during the months of March and April 1994. The questionnaire used three approaches to assess ability to pay. Clients were asked about family income, ownership of durable goods, and consumption of specific goods and services that, in the Ecuadoran context, could be interpreted as indicators of higher economic status.

The affordability of the existing fee structure was evaluated by relating prices to client income. Average prices were calculated for a year of IUD use (including follow-up visits) and for a typical course of gynecological treatment (including laboratory tests). An indicator of affordability was computed by dividing these index prices by clients' annual household incomes. Variability in affordability within clinics was examined by comput-

ing the ratio of price to income for clients at the twentieth, fiftieth, and eightieth percentile of income in each clinic.

To determine which clinics were similar in terms of clients' ability to pay, a hierarchical cluster analysis was performed. Data from the client survey were used to create a summary profile of economic status for each clinic. The CLUSTER procedure (SPSS, 1993) was used to group clinics into clusters, employing the following variables: proportion of clients working outside the home, proportion owning a refrigerator, proportion that had consumed meat on at least two of the previous three days, and median family income. These variables were selected as indicators of clients' control of income, overall family wealth, and current income levels.

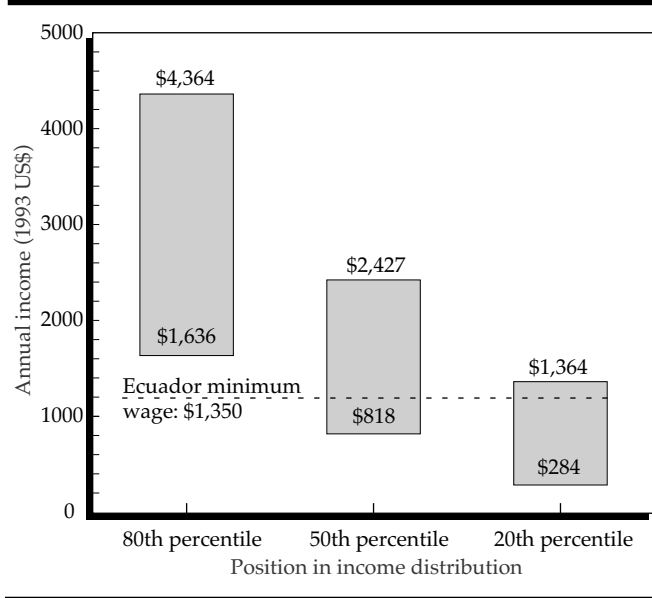
Results

Although CEMOPLAF's stated mission is to serve the poor (and many in the agency believe that clients are primarily women with low incomes), the data suggest that many CEMOPLAF clients were relatively well off. Median educational attainment of all clients was some secondary schooling, but nearly 35 percent had either completed secondary school or had attended a university or technical school. Forty percent of clients owned their homes, and 45 percent owned a refrigerator. Almost one-third of clients with school-aged children reported sending their children to private schools, and more than 70 percent of clients said that they had consumed meat on at least two of the three days prior to the interview.

Monetary outlays associated with these consumption patterns suggest high economic status. For example, costs of tuition for private schools vary considerably depending on the location and type of school, but as an approximation, CEMOPLAF senior staff estimated that annual costs would range from \$600 to \$2,400 per student (de Vargas, 1994). Likewise, a representative annual expenditure on meat for the average CEMOPLAF household (4.2 persons) would be approximately \$300 (Pinto, 1994).

Mean family income of all clients in the survey was approximately 4 million sucres annually, or roughly \$2,000, at average 1994 exchange rates. Figure 1 shows the variability of clients' household incomes. Each bar represents the range of incomes across clinics at a specified point in the income distribution. For example, the first bar shows that for clients at the eightieth percentile of the income distribution across clinics, annual household incomes ranged from a low of \$1,636 to a high of \$4,364. The same information is presented for middle-income clients (the fiftieth percentile bar) and for low-income clients (the twentieth percentile bar). For all three

Figure 1 Variation across CEMOPLAF clinics in clients' annual household income, according to selected income-distribution points, Ecuador, 1994



bars, the central tendency (as measured by the median) is closer to the low end of the range.

To put these incomes into perspective, the government of Ecuador has an official minimum wage for an individual of approximately \$1,000 annually, which is thought to represent the threshold of poverty. In the figure above, the horizontal dotted line represents the minimum wage for a household, given that 35 percent of CEMOPLAF households have two wage earners. Nearly all clients at the twentieth percentile of the income distribution in each clinic fall below this line, whereas most clients at the fiftieth percentile and all clients at the eightieth percentile are above the line.

Affordability of CEMOPLAF Fees

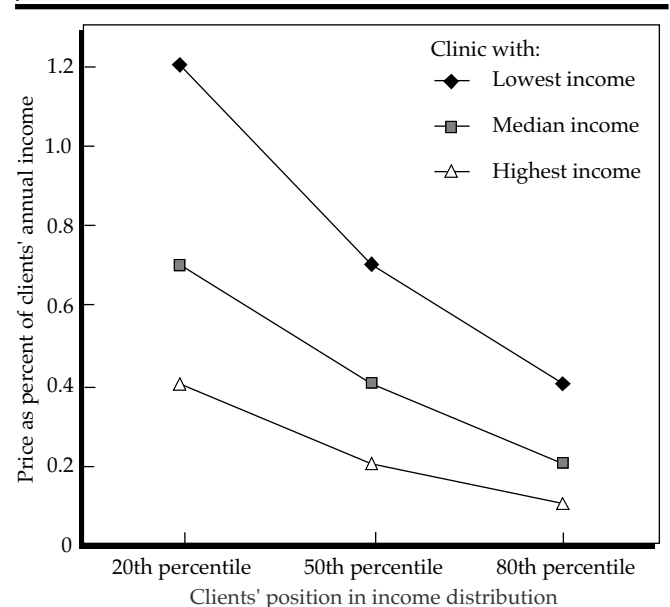
Affordability of CEMOPLAF fees can be evaluated in two ways: in relation to fees charged by competing providers, and in relation to clients' incomes. The median fee charged for an IUD insertion in all clinics was \$4, whereas the median fee for a year of IUD use or a course of gynecological treatment was \$6.¹ Private-sector prices for these services are much higher. According to the results of a telephone survey of private providers conducted in July 1994 in Quito, prices for IUD insertions and gynecology visits ranged from \$10 to \$25 (Ayabaca, 1994). Although these prices define the upper boundaries of the price range nationwide (because they reflect market conditions in the capital city), CEMOPLAF prices are clearly much lower than average prices in the private sector.

Information on the relationship between clients' incomes and CEMOPLAF prices is presented in Figure 2. The three lines correspond to three clinics: The top line represents the clinic with the lowest client median income; the middle line represents the clinic at the midpoint of the distribution of client income (that is, the median of medians); and the bottom line represents the clinic in which clients' median income is highest. The points on each line show the proportion of clients' annual income needed to purchase one year of services, for clients at different points in the income distribution. For example, the point in the upper left-hand region shows that clients having relatively low income using the clinic with the lowest level of client income would pay 1.2 percent of their annual income for services. As expected, services consume a relatively larger share of a client's income in poorer clinics (the top line) and at lower points in the income distribution (that is, at the twentieth percentile).

The key finding shown in the figure is that for nearly all clients, CEMOPLAF services consume less than 1 percent of annual household income. Only the poorest clients in the lowest-income clinics would pay more than 1 percent, and then only slightly more. Most clients pay 0.5 percent of annual income or less.

The hierarchical cluster analysis produced three groups of clinics. One clinic in Quito was the only member of its cluster, having the highest values on all of the four variables used to group clinics into clusters. At the other extreme were three clinics in small towns that were at or near the bottom of the distribution for all four vari-

Figure 2 Percentage of annual income needed to purchase CEMOPLAF services, by level of clinic's affluence and clients' position in the distribution of income, Ecuador



ables. The remaining 16 clinics formed an intermediate cluster. Although these 16 clinics serve a clientele that is largely homogeneous in terms of the four variables used to form clusters, fees charged by clinics within this cluster vary substantially. For example, average prices for family planning services ranged from \$1.21 to \$2.00 (a difference of 65 percent), and average prices for non-family planning services ranged from \$1.50 to \$2.33 (a difference of 55 percent). Ironically, one of the clinics in the low-status cluster charged the highest average price for non-family planning services. Such variation occurs because CEMOPLAF's management philosophy encourages local decisionmaking on pricing issues.

Policy Change and Outcomes

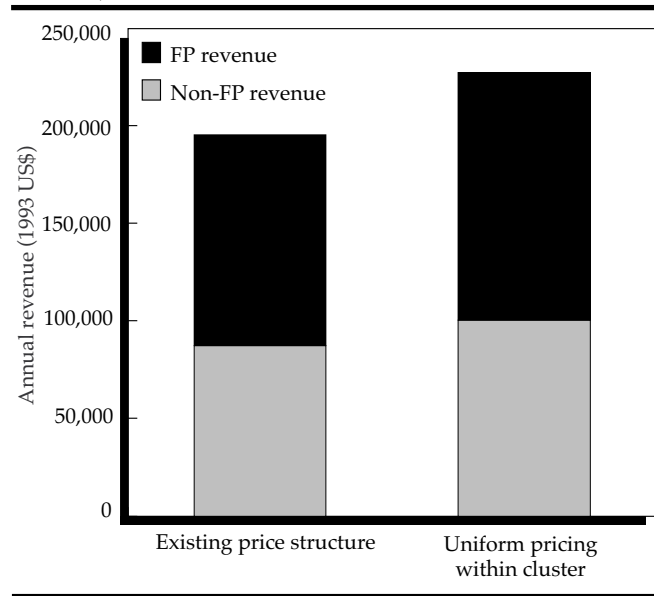
Results and recommendations were presented to CEMOPLAF clinic directors and senior staff at a seminar in April 1994. A consensus was reached around the broad conclusions that prices were too low in most clinics, that intercluster price variations should be reduced, and that prices should be increased periodically, perhaps linked to semiannual salary increases. However, CEMOPLAF's decentralized decisionmaking leaves implementation of such policies to the discretion of clinic directors, many of whom choose to emphasize staff productivity over financial sustainability. Although some clinics adjusted fees to conform to study recommendations, others did not, creating the potential for friction between compliant and noncompliant clinics.

In the absence of data, simulation exercises can be used to model the impact on CEMOPLAF revenues if the pricing recommendations had been fully implemented. For example, Figure 3 shows the financial impact of eliminating intracluster variability in prices, assuming that all clinics in each cluster could charge the prices of the highest-priced clinic in their cluster. This assumption is not completely realistic, because price increases usually are associated with declines in demand, and even though a person may be "able to pay," higher prices may make them unwilling to pay. Therefore, this projection should be interpreted as a best-case scenario.

The first bar shows revenues earned from family planning and non-family planning services under the current pricing structure, in which each clinic charges its own price. The second bar shows the income that could be earned if the clinics were grouped into three clusters, and all clinics within each cluster charged the same fees as the highest-price clinic within that cluster. If demand were unchanged, annual revenues would rise from \$195,467 to \$227,311, an increase of almost \$32,000.

A major concern of program managers is that price increases will reduce access to services for low-income

Figure 3 Changes in annual CEMOPLAF clinic revenue if intracluster price variations were eliminated, by source of revenue, Ecuador



clients. Predicting the impact of a given price increase on overall demand, much less the impact on different socioeconomic groups, is difficult. A true experimental study to measure the demand response to various price changes is under way at CEMOPLAF. However, such a study cannot provide guidance to program managers on how to identify those clients who would require a subsidy in order to adopt or continue to use services. Additional research is needed to identify reliable and feasible proxy measures for ability to pay that eventually could be used to protect truly needy clients from the effects of blanket price increases.

Study 3: Estimating Profitability of Ultrasound Services

NGOs in Latin America have been experimenting with income-generation schemes since the early 1980s. In 1992, CEMOPLAF decided to offer ultrasound services in its pilot clinic in Quito to generate additional income. Ultrasound was chosen over other possible services because management felt that the large caseload of gynecology and prenatal clients gave the agency a comparative advantage. Profits from ultrasound were used to subsidize family planning services. This initial experience proved successful, and created the momentum for expanding ultrasound services to other clinics. However, CEMOPLAF wanted to assess capabilities and the potential market at each site before purchasing several costly machines, and to estimate the profitability of the service (Bratt et al., 1994).

Methods

Profitability was the key criterion for determining which clinics would receive ultrasound, and study methods focused on estimation of costs and income. Costs of providing ultrasound included personnel, equipment, training, materials and supplies, promotion, and improvements to clinic infrastructure. This information was collected through structured interviews with clinic directors and observation of clinic infrastructure.

Revenue projections were based on two factors: (1) estimated demand for ultrasound services within the clinic and (2) prices charged by competing providers of ultrasound services. Demand estimates were derived using data from the pilot ultrasound facility in Quito. CEMOPLAF gynecology and prenatal clients were found to be the most likely users of ultrasound services. The observed rate of ultrasound procedures per 100 gynecology and prenatal visits in the pilot clinic was extrapolated to other potential sites. Prices charged by competing providers were obtained through interviews with clinic directors. Annual profits or losses were calculated by subtracting costs from revenues. Break-even points were determined by establishing the number of ultrasound procedures needed for each clinic to cover its costs fully.

Results

Of the 19 potential ultrasound sites, 12 were eliminated outright because of low client load or absence of necessary staff and infrastructure. Costs of providing ultrasound services in the seven remaining clinics were estimated to range from \$10,000 to \$22,000 in the first year of operation. Variation in costs was due mainly to higher costs of staff and equipment in one clinic, to differences in variable costs (which fluctuate according to the number of procedures), and to start-up costs such as clinic remodeling and promotion.

In its first full year of operation, CEMOPLAF's existing ultrasound facility in Quito performed 19 ultrasounds per 100 gynecology and prenatal visits. Using this factor to extrapolate demand to other clinics, an estimate that 1,000 or more ultrasounds could be performed annually in six clinics was calculated. Prices charged by competing ultrasound providers in these markets ranged from \$6.82 to \$9.09 per procedure. Multiplying these market prices by demand estimates yielded projections of first-year income per clinic ranging from \$7,500 to \$27,270, led by CEMOPLAF's existing ultrasound service.

When the list of high-demand clinics was compared with the list of suitable clinics, a final group of

four clinics emerged in which profits could be earned. With an optimistic scenario of growth in ultrasound demand of 10 percent per year (based on CEMOPLAF's 11 percent annual growth rate in gynecology and prenatal visits over the previous four-year period), two of the clinics were projected to break even in the first year, and six would be profitable by the fifth year. However, when cumulative five-year profits were calculated, only three clinics were projected to earn enough income to cover more than costs; total five-year profits in these three clinics would be \$93,909. When a more conservative scenario of 3 percent annual growth in ultrasound demand is used (consistent with projected increases in the population of Ecuadoran women of reproductive age), projected five-year profits in these clinics drop to \$64,419.

Policy Change and Outcomes

Prior to carrying out this study, CEMOPLAF managers had been prepared to purchase as many as ten ultrasound machines, an investment of at least \$250,000. The decision on where to place these machines would have been extremely difficult, because initially, 19 clinic directors wanted to provide the service. If this study had not been carried out, internal agency politics likely would have played a much larger role in framing the decision about which clinics should receive ultrasound machines. But by clearly defining objectives and carrying out a formal, well-documented research project to evaluate alternatives, CEMOPLAF managers ensured that potential profitability would decide the issue. CEMOPLAF ultimately purchased three machines, installed them in the sites recommended in the study, and all three have proved to be profitable.

The impact of any new service on quality of care and access is difficult to predict. One of the key reasons for adding services like ultrasound is to generate resources that can be used to pay for clinic improvements and also to subsidize poor clients. Presumably, these outcomes would work to increase quality and access. However, program planners need to consider carefully the impact that a new service can have on existing services. Adding services indiscriminately could eventually crowd out users of core services, and force the program to incur higher costs in the long run, because investments must be made to increase fixed capacity.

Comparison of the Three Interventions

The three examples discussed in this paper resulted in a range of actual or projected financial outcomes, summarized in Table 3. A simple presentation of results in

Table 3 Annual financial impact of three sustainability interventions, Ecuador

Intervention	Financial gain/ cost savings	Percentage increment in cost- recovery ratio, CEMOPLAF, 1993
Change IUD revisit norm	\$9,159	1.1
Standardization of prices within clinic clusters	\$31,844	3.7
Expansion of ultrasound services	\$18,000	2.1
Total	\$59,003	6.9

Note: Amounts given in 1993 US dollars.

terms of return on investment or percentage increase in revenues can be misleading. For example, Study 2 predicted a 16 percent increase in revenues if prices within clinic clusters were standardized. However, in order to measure the contribution made by each intervention toward CEMOPLAF sustainability, results of interventions must be presented in the context of total annual expenditures, as shown in the third column.

In 1993, CEMOPLAF's total income from all sources was \$603,100, whereas total expenditures were \$854,750, producing a cost-recovery ratio of 70.5 percent. The numbers in column three show the increment in the cost-recovery ratio from each intervention. For example, changing the IUD revisit norm increased the cost-recovery ratio by 1.1 percentage points, or from 70.5 percent to 71.6 percent. The total change in the cost-recovery ratio from all three interventions is almost 7 percent.

Discussion

Like many NGOs in Latin America, CEMOPLAF has experimented with different strategies for increasing income and reducing costs. Using operations research permitted CEMOPLAF to adopt an IUD follow-up norm that balanced access, quality of care, and costs. The agency surveyed clients to better understand their market and made projections of potential profitability of ultrasound services to avoid a possible financial loss. In addition to the information generated by these studies, CEMOPLAF realized other benefits from its experience with operations research: Staff became committed to using data for decisionmaking and learned an array of fundamental business skills such as cost analysis, market research, and financial forecasting.

Regarding the success of the interventions themselves, although all three did contribute additional resources to the institution, no single intervention made a large impact on CEMOPLAF's overall cost-recovery ratio. Thus, whereas neither CEMOPLAF nor any other institution has yet discovered a foolproof key to sustainability, the agency's use of operations research has helped to identify interventions that yield net financial gains.

Even modest success deserves attention, however, because many efforts to improve an agency's financial situation have been less successful than those reviewed here. Some have resulted in financial losses (McInerney and de la Quintana, 1994), whereas others have required more time to break even than expected (CEMOPLAF et al., 1996). An important lesson is that progress toward sustainability requires considerable effort, and success is often measured in small increments. CEMOPLAF's 1997 cost-recovery ratio of 78 percent reflects years of hard work and dedication on several fronts to becoming less donor-dependent. Although any single intervention may result in only a two- or three-percentage-point increase in costs recovered, CEMOPLAF's experience proves that organizations that are persistent can make substantial progress toward sustainability over the long run.

CEMOPLAF's experience also shows that organizations with an entrepreneurial bent can find other ways to cover projected declines in USAID funding. In recent years, CEMOPLAF has secured grants and contracts from several non-USAID donors, including the governments of Belgium, Canada, Japan, and the Netherlands, and also from US-based agencies such as CARE and World Neighbors. Within Ecuador, CEMOPLAF has received support from the local chapter of Rotary International and has negotiated agreements to provide health-care services for factory workers and employees of export-oriented flower plantations.

If CEMOPLAF can be expected to survive without USAID, what is the outlook for other NGOs in the Latin America region? Can elements of the CEMOPLAF model be adopted to help other agencies survive in an era of greatly reduced funding from USAID? Several factors argue against an easy replication of CEMOPLAF's experience. First and most important, few institutions can match CEMOPLAF's drive to become less donor-dependent and the accompanying willingness to take risks inherent in pursuing that goal. In contrast, many current NGO leaders come out of a strong tradition in Latin America that postulates free health-care services as a basic right of all citizens. This perspective was reinforced during the 1960s and 1970s in donor policies that sought to maximize demand by providing free family planning services. NGOs were encouraged to focus mainly on output, measured by new users or couple-years of protection (CYPs), leaving financial concerns to the donors. Executives who have spent their careers adhering to a social service ethic have had difficulty coming to terms with reduced funding, and have been less aggressive in seeking ways to become financially sustainable.

Time is running out for USAID-funded NGOs in many Latin American countries. In recent years, USAID has reduced its presence in the region by closing mis-

sions in Argentina, Chile, Uruguay, Costa Rica, and the English-speaking Caribbean; by terminating support for reproductive health activities in Colombia; and by eliminating bilateral programs in favor of activities administered by Cooperating Agencies in Brazil, Mexico, and Paraguay. Funding levels have fluctuated greatly because of opposition in the United States Congress to international family planning programs. Consequently, NGOs that depend heavily on USAID funding and are just starting to work on sustainability probably will not have enough time to make the transition. CEMOPLAF has avoided this problem because the self-sufficiency ideal has been built in to all agency activities since CEMOPLAF was founded in 1974. Thus, unlike many NGOs, CEMOPLAF has not recently had to redefine its goals to include sustainability, a process that has created much turmoil in many other institutions.

Another factor enabling CEMOPLAF's success is the agency's exceptionally close relationship with its principal donor, USAID/Ecuador. Rather than encouraging CEMOPLAF to maximize CYPs or some other output indicator, USAID/Ecuador helped to focus CEMOPLAF on sustainability by supporting the institution with substantial funding, direct technical assistance, and access to international expertise in operations research and applied economic analysis. CEMOPLAF has enjoyed an unusually strong relationship with USAID/Ecuador notable for its high level of collegiality and mutual respect.

A final factor is related to Ecuador's deteriorating economy, which, ironically, may also have created conditions that encouraged the success of sustainability interventions based on income generation. The "ability to pay" study showed that many CEMOPLAF clients, far from being poor, actually belonged to relatively high socioeconomic strata, a finding that reinforced the conclusions of Janowitz and Bixby's (1990) analysis of data from the 1988 Ecuadoran Demographic and Health Survey. This situation may be related to Ecuador's economic problems and accompanying high inflation.² As real incomes continue to fall, formerly middle-class clients may be shifting their health-care purchases away from private-sector providers, toward high-quality, low-priced programs like CEMOPLAF. Meanwhile, the truly destitute clients (those who cannot afford to pay anything for services) may be switching to public-sector providers or quitting the use of contraceptives altogether. The result is that CEMOPLAF's clientele now includes more women with the financial means to pay higher prices and to demand profit-generating services such as ultrasound.

Nongovernmental providers of family planning and reproductive health services in Latin America have entered a period of consolidation. Unfortunately, few organizations are as well-prepared as CEMOPLAF to suc-

ceed in an environment of reduced donor support. Some agencies may have developed an entrepreneurial outlook, but lack the time and skills needed to make sufficient progress toward sustainability. Others continue to resist the imperative to seek alternatives to donor funding, perhaps because the prospect of generating income from services creates a sense of shame, as if an agency's social mission obligates it to produce all services at a loss. NGOs that hold on to such attitudes will find it difficult to survive in coming years, and the pace of NGO failures in the region will probably increase.

Notes

- 1 The price of one year of IUD services includes the price of the insertion visit plus the price of the 2.3 revisits that the average client makes during the first year of use. The price of one year of gynecological services includes the price of 2.4 visits plus the price of laboratory exams customarily ordered for these clients.
- 2 Evidence from Ecuador's two most recent DHS surveys supports this hypothesis. Changes in the wealth-index variable (see below) from 1988 to 1994 show that a larger proportion of CEMOPLAF IUD and oral contraceptive users were classified as "high wealth," whereas the proportion of "low wealth" clients declined (see below). Meanwhile, the trend in the country as a whole was in the opposite direction: The proportion of women classified as "high wealth" fell from 55 percent in 1988 to 42 percent in 1994.

Wealth index for CEMOPLAF clients and all Ecuadoran women, 1989-94

User category	Wealth index (percent) Year of DHS survey	
	1988	1994
CEMOPLAF IUD users		
Low	11.8	6.5
Medium	49.0	38.4
High	39.2	55.1
CEMOPLAF oral contraceptive users		
Low	20.6	14.1
Medium	55.9	44.7
High	23.5	41.2
All survey respondents		
Low	19.3	17.2
Medium	25.0	40.9
High	55.3	41.9

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