

HFS Technical Note No. 9

**COST RECOVERY
IN PVO HEALTH CARE CENTERS
IN ECUADOR:**

Evaluation of the MAP Experiment



**Health
Financing
and
Sustainability
Project**

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Health Financing and Sustainability (HFS) Project

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ABSTRACT

The authors evaluate a six-year experiment in which two private health centers, one urban and one rural, attempt to achieve financial self-sufficiency and serve low-income people in Ecuador. Originally managed by MAP International, a US-based private voluntary organization (PVO), both centers are currently under local management and provide medical consultation, pharmacy and laboratory services. The report analyzes income expenditures to determine the levels of cost recovery; analyzes cost recovery success or failure; and assesses the socio-economic characteristics of project beneficiaries during the period January 1990 through September 1991. The outlook for sustained self-sufficiency of both centers is tenuous. The urban center served middle and low-income people and the rural center served people under the poverty line. Recommendations to achieve unsubsidized self-sufficiency and to reach the neediest include: doing market research and business planning; targeting price subsidies; decentralizing decision making; and simultaneously testing different alternatives over shorter periods. This report contributes to the design of future projects and will help the present management of the health centers to direct operations.

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EXECUTIVE SUMMARY

The MAP Alternative Health Financing Project

Between 1985 and 1991, USAID/Quito supported an experimental project aimed at testing alternative financing systems for basic health care. The project was carried out through a \$745,000 grant to MAP International (a Georgia-based health assistance PVO). The principal objectives of the project were twofold:

- Establish two private health centers, one urban and one rural, which would endeavor to become financially self-sufficient by the end of the project; and
- Improve the health status of low-income people, particularly mothers and children, who did not have access to primary health care.

The urban health center, Solanda, was the first to open its doors in September 1988 with the initiation of its medical clinic. A laboratory followed in February of 1989, and a small pharmacy began filling prescriptions later in the same year. The first service offered in Marcabelí was the laboratory, which opened in February 1989. In 1990, a small pharmacy was added to the operation. Finally, in the last months of 1991, a physician began offering medical consultations twice a week in Marcabelí; however, no data was available to assess the financial status of this service. By the end of the project, then, both sites offered medical consultations, laboratory services, and basic pharmacy products, and both were in the hands of local groups.

A common characteristic of Solanda and Marcabelí operations was that they charged fees for their services, and attempted to make a profit or break even on the sales from pharmaceuticals and related products. Both health centers were successful at generating income through fees and sales. In addition, both health centers succeeded at obtaining financial support from other sources. Finally, a substantial portion of services provided by both health centers were aimed at women and children — the groups most in need of basic health care.

Study Objectives

The main purpose of this study is to assess for USAID, the Ministry of Public Health, MAP, and the local communities the degree to which the project achieved its goals of developing financially self-sustaining basic health services and serving low-income families. Therefore, this evaluation is organized around three objectives:

- Determine the levels of cost recovery by analyzing income and expenditures;
- Analyze cost recovery success or failure; and
- Assess the socioeconomic characteristics of project beneficiaries.

To achieve these objectives, the authors carried out a comprehensive financial analysis of health center, MAP, and USAID accounts and records during the 21-month period, January 1990 through September 1991. In addition, they estimated capital expenditures and collected data on the prices and supply of competing private services. Finally, the authors carried out a sample survey of health center registration cards at Solanda, re-analyzed previous surveys, and consulted with secondary survey sources to make assessments about the socioeconomic status of project beneficiaries.

One of the main benefits of this evaluation will be the information it furnishes to the new managers of the two health centers. As this is written, they are struggling to maintain health center operations in the absence of MAP subsidies.

Study Findings

1. **Levels of Cost Recovery: Solanda.** The Solanda Health Center recovered 43.0 percent of its operating costs in 1990 and 36.7 percent of its operating costs in the first three quarters of 1991. With capital costs taken into account, the recovery percentages fall to 33.0 and 30.6 percent respectively for the two periods. During 1990, the year in which the health center functioned largely without interruption, the laboratory and pharmacy cost centers each recovered about 70 percent of their operating expenses. Medical clinic revenues, in contrast, covered only 25 percent of operating expenses for that cost center.

Levels of Cost Recovery: Marcabelí. The Marcabelí figures cover the pharmacy and laboratory cost centers. In 1990, the laboratory and pharmacy recouped 65 percent of operating costs. For the first three quarters of 1991, the figure jumped to over 100 percent. Recovery of operating and capital costs follows a similar trajectory reaching 100 percent by mid-1991.

2. **Analysis of Cost Recovery Performance.** The Solanda Health Center fell short of financial self-sufficiency mainly because of pricing medical consultations too low, internal inefficiencies related to health center management, strong competition from nearby clinics and physicians, disruptions in service provision, and a high-cost finance and administrative structure.

On the other hand, Marcabelí attained complete financial self-sufficiency by project termination thanks to a low wage structure, efficient and low-cost administration, and modest capital expenditures. However, financial sustainability at Marcabelí is tenuous. Price increases have not kept up with inflation, and only declining real wages kept Marcabelí in the black in 1991. The laboratory operated far under capacity, and there was growing competition from local pharmacies and laboratories.

3. **Socioeconomic Characteristics of Beneficiaries.** Although the information on socioeconomic characteristics of Solanda Health Center users is not conclusive, it seems to place them approximately in the middle range of urban income distribution. Many of them have occupations which are concentrated in the middle- and lower-income groups. Educational levels are consistent with the average for large urban areas which associates them strongly with the average income group. Finally, their household characteristics including home ownership

and possessions, suggest incomes which are much higher than those reported in the surveys. Based on this information, it is probably safe to assert that the Solanda Health Center beneficiaries are not in the lowest income percentiles. Neither are they in the highest percentiles. The evidence suggests that the typical person served by the Solanda Health Center is probably the average suburban Quito citizen.

Much less information on beneficiaries is available for Marcabelí. The authors used informant and personal observations, along with scattered data on the Marcabelí area to arrive at tentative conclusions about the population. This evidence suggests that the majority of the population served by the Marcabelí Health Center fall under the poverty line, and are among the lowest income percentiles in the country. This conclusion is consistent with national figures showing that 78 percent of all rural families in Ecuador are estimated to be living in poverty.

Lessons Learned

Lessons can be derived from the MAP experience that will help in the design of future projects which have the objective of stimulating private, un-subsidized health services for low income groups. The main lessons from the MAP experiment are:

- **Understand the Market.** It is important to know basic information about the contemplated market for health services before investing in an infrastructure and committing to recurrent costs. This will help project designers to determine what groups should be targeted for what kinds of services, what competition exists, what are accepted prices, and who can and cannot pay *before* services and prices are structured.
- **Price the Services Correctly.** If financial self-sufficiency is a goal, prices must reflect the actual costs of service delivery. In the absence of subsidies, prices must exceed actual costs so that profits can in turn subsidize those who can not pay, or cost centers that are not profitable.
- **Target Subsidies Through Price Discrimination.** The potential reduction in demand caused by market pricing can be offset through some form of means testing scheme.
- **Use Common Business Management Practices.** Achieving efficiency (and therefore maximizing cost recovery potential) requires the information and ability to carry out basic business and financial analyses, and to develop a business strategy. These need not be complex or complicated, but should provide information about such items: unit costs, financial status by cost center, utilization levels, and productivity.
- **Decentralize Decision Making.** When health center employees and administrators are involved in decision making, they tend to make decisions which enhance cost recovery.

- **Simplify Relations With Community.** Large investments in community relations and educational activities are probably not required to establish and maintain self-financing health centers.
- **Test Different Alternatives Simultaneously.** This project tested one possible approach to alternative basic health financing over a six-and-a-half year period. In the future, the most efficient way to expand options for private health care would be to test alternate financing and service provision approaches simultaneously, more rigorously, and in a shorter period of time.

1.0 PROJECT BACKGROUND

Between 1985 and 1991, USAID/Quito supported an experimental project aimed at testing alternative financing systems for basic health care. The project was carried out through a \$745,000 grant to MAP International, a Georgia-based health assistance PVO. Although the grant agreement was signed in 1985, current operations did not commence in earnest until late 1988. The agreement terminated on December 31, 1991.

The principal objective of the grant agreement was clear. In cooperation with one urban and one rural community, MAP was to establish two private health centers which, over the course of the project, would endeavor to become "self-sufficient" (PIO/T August 1991). During the establishment and initial operation of these health centers, MAP would analyze progress and assess the viability of the approach. A secondary objective was to improve the health status of people who did not have access to primary health care. These objectives are reiterated throughout the USAID/Quito documents on the project (USAID 1990).

The term "self-sufficient" took on different meanings during the six-year life of the project. MAP's, and USAID's, original intent was clearly that the term referred to financial self-sufficiency. According to the MAP proposal to USAID, the project hoped to achieve health care financing "without subsidy" (MAP International 1985). The intended beneficiaries of the project were to be the surrounding low-income families—in particular mothers and children.

1.1 Project Start

MAP experienced delays in project implementation from the start. First, it took considerable time for USAID to obligate sufficient funds to initiate activities. Second, MAP targeted as its initial rural site the Canton of Guamote in Chimborazo Province. It transferred staff there and began the process of establishing a health center. Activities in Guamote were abandoned in 1987 after MAP concluded that its proposed fee-charging health center could not compete with the numerous other PVOs working there which were offering health services for free. Third, there were design and start-up problems in the urban site such that activities could not begin until 1987.

A replacement rural site was identified in 1987 in the Province of El Oro in the Canton of Marcabellí. The town of Marcabellí is two-and-a-half hours by bus southwest of the port city of Machala. Its 2,000-plus inhabitants and surrounding villages live primarily from agricultural and livestock activities. At the start of project activities in Marcabellí, there existed only a small Ministry of Public Health (*Ministerio de Salud Pública* [MSP]) center to serve the local population. MAP staff established themselves in Marcabellí in 1987, and in collaboration with local citizens, began the tasks of identifying health needs and designing a project approach.

At the same time, MAP staff established themselves in the Solanda neighborhood (*barrio*) located in the southern outskirts of Quito. This *barrio* was developed through a joint project between USAID and the Housing Bank of Ecuador aimed at constructing and financing basic housing for low-income, urban wage earners. MAP worked with local community groups to determine needs and design a package of health services. MAP also worked with the *Fundación Mariana de Jesus*, the local foundation which donated the land for the Solanda development, to locate a health center site.

1.2 Project Implementation

Establishing health services at both project sites required a number of important preliminary steps. These included reaching agreement with the communities on the types of services, the fees to be charged, selecting and securing office and health center space, ordering equipment, hiring staff, setting administrative procedures and policies, and generating demand.

In addition, MAP adopted an approach to the project which focused primarily on improving community health services through educational activities. In each site, therefore, MAP staff developed extensive health and community education programs in addition to direct service provision through the health centers. In fact, the health and community education programs of the project consumed the majority of project resources during its six-year operation.

The urban health center, Solanda, was the first to open its doors in September 1988 with the initiation of its medical clinic. A laboratory followed in February of 1989, and a small pharmacy (*botica*) began filling prescriptions later in the same year. All three service or cost centers operated through the end of 1991. At that time, the Solanda Health Center was turned over to the Solanda Catholic Parish, which assumed total responsibility for the continuation of the services.

In Marcabelí, MAP helped foster, and then worked closely with the town's private health committee (*Comité de Salud*) in both community education activities and health services. The first service offered in Marcabelí was the laboratory, which opened in February 1989. In 1990, the *Comité* added a small pharmacy to the operation. Finally, in August 1991, near the end of the MAP project, a physician began offering medical consultations twice a week. In December 1991, the health center was formally turned over to the Marcabelí Health *Comité*. By the end of the project, then, both sites offered medical consultations, laboratory services, and basic pharmacy products, and both were in the hands of local groups.

The methods that MAP employed to initiate and maintain services at each site were different. In Solanda, the majority of employees working at the health center were paid directly by MAP. In addition, MAP paid for basic equipment and furniture, and capital improvements, and directly subsidized supplies, rent, and other operating expenses through cash transfers and direct payments. In Marcabelí, a much smaller operation, MAP only occasionally paid health center salaries. It provided equipment and furniture, and made periodic cash transfers to the *Comité* which, in turn, purchased supplies, paid rent, or met other short-term financial needs.

At both sites, MAP maintained resident technical advisors who, as mentioned above, spent the majority of their time engaged in community education programs. Some of these, however, assisted from time to time in administering and managing health center activities. By and large, health center operations were carried out by the health center employees themselves.

A common characteristic of Solanda and Marcabelí operations was that they charged fees for their services, and attempted to make a profit or break even on the sales from pharmaceuticals and related products. Both health centers were successful at generating income through fees and sales. In addition, both health centers succeeded at obtaining financial support from other sources.

2.0 EVALUATION OBJECTIVES, METHODOLOGY, AND ACTIVITIES

The main purpose of this evaluation is to assess for USAID, the Ministry of Public Health, MAP, and the local communities the degree to which the project achieved its goals of developing financially self-sustaining basic health services and serving low-income families. Therefore, this evaluation is organized around three objectives:

1. Analyze income and expenditures to determine the levels of cost recovery;
2. Analyze cost recovery success or failure; and
3. Assess the socioeconomic characteristics of project beneficiaries.

Clearly, the answers to these questions do not provide a full evaluation of the USAID-MAP project. This study needs to be considered in the context of past evaluations and a recent evaluation commissioned by MAP in the Fall of 1991 (Crespo 1991). This latter evaluation focused on the institutional and community factors affecting the project and its development.

This evaluation employs financial and socioeconomic analyses to answer the three questions posed above. Data collection and analysis took place during the final months of the project, November and December 1991. This included site visits to both health centers, and working periods at MAP International and USAID in Quito. Additional information was collected and analyzed in January 1992. The authors of the study carried out the research and prepared the report.

2.1 Financial Analysis

The principal sources for financial analysis included USAID records, MAP central accounts and reports, and health center account books. Health center employees, MAP personnel, and local community members also provided essential background information and helped interpret the various account books.

Data on revenues were relatively easy to collect and assign, since they are clearly identified in the health center accounts, such as laboratory fees, medical consultation fees, and interest, among others. Cost information was more difficult to obtain, since expenditures were incurred by the health centers, MAP, and in several cases by third parties. This required combining account information from different sources to create a complete picture of costs. In addition, bookkeepers did not always identify expenditures by cost center. Finally, some expenditures such as rent and utilities were shared across cost centers. Assembling costs and allocating them to cost centers, therefore, required additional effort including searching for financial records such as pay vouchers, developing methods for assigning shared expenditures, and determining expenditures by third parties, for example, the Ministry of Public Health/Municipality of Marcabelí.

Other factors affecting income and expenditures included estimating capital costs, and adjusting for changes in pharmacy inventories from quarter to quarter. The authors collected inventory records, verified them in person, collected expenditure and date-of-expenditure information from MAP and the health centers, depreciated these expenditures over time according to accepted Ecuadorian accounting and tax practices, and allocated the costs to each cost center. To the extent feasible, pharmacy inventories were analyzed in order to hold constant the effects of changes in inventory size on operating income and expenditures. Procedures and comments on how income and expenditures were collected and allocated can be found in the "Technical Notes" appended to this report.

Income and expenditure data from the different sources were combined into basic tables depicting operating, subsidy and other income, and operating and capital costs by cost center. From these tables, the authors derived the percentages of cost recovery at the operating, and total cost levels.

To assess factors affecting levels of cost recovery, the authors analyzed costs per patient and per examination over time. Through small surveys, they investigated the prices and supply of competing services, and examined the ability of clients to pay. In addition, they assessed the possible effects of the project design on the success of cost recovery efforts.

Finally, the authors analyzed the overall expenditures of MAP in this project to extract the expenses directly related to provision of technical assistance to the health centers.

2.2 Socioeconomic Analysis

The purpose of this part of the evaluation was to draw conclusions about the characteristics of the clientele served by the two health centers. In Solanda, the authors accomplished this task by sampling two data sets, and by reviewing other secondary sources. A 10 percent interval sample was drawn of the entire set of family registration cards at the health center. These were compared to a 10 percent interval sample of a household survey carried out by MAP in 1991. In addition, the authors compared the results of the registration card sample to a 1988 household survey in Solanda related to USAID's housing finance project. Finally, the authors also compared the health center registration card data to a small household survey carried out in 1989 as part of a women in development assessment.

In contrast to Solanda, there is virtually no information about the population of Marcabelí. The laboratory and the pharmacy kept no records on patients other than the name and age of the person receiving the exam. The pharmacy kept no records on purchasers. The medical clinic, which is comprised of a single visiting physician, had no available records at the time of the study. Patient information was kept personally by the physician who, despite repeated requests, had not turned over any reports to the Marcabelí Health *Comité*.

Conducting an on-site survey of beneficiaries would not have been feasible without considerably more time and funds. The authors estimate that the medical clinic, due to its recent start-up and weekend-only hours, had not been open for more than 30 days in total in 1991. The laboratory has a very uneven patient flow which varies by several fold from month to month. During the site visit of the authors, the laboratory technician was seeing only a few patients a day. For example, the laboratory had only 37 patients the last two weeks of November 1991. A statistically significant sample of the yearly patient population would have taken several months to carry out.

Due to the lack of concrete information on beneficiaries, the authors relied upon a few scattered reports on the Marcabelí area, what little could be extracted from laboratory records, and the observations of Health *Comité* members to reach conclusions about project beneficiaries.

2.3 Period of Study

Although the Solanda Health Center opened its doors in late 1988 and Marcabelí began in early 1989, this study considers only the years 1990 and 1991. There are two main reasons for limiting the study to this time frame. First, there are no available Marcabelí account books before 1990, and the Solanda accounts for 1989 and 1988 are unreliable, according to the current administrator. Not only did accounting methods change at Solanda, but the staff in charge of maintaining them apparently possessed less than adequate accounting skills. Second, the initial years of operation were distorted by the infusions of MAP subsidies associated with starting up services. By 1990, operations in both locations had reached a level of financial equilibrium compared to previous years. Therefore, 1990 and 1991 yield the most accurate picture of the outcomes of the project and provide the most current assessment of the financial viability of the two health centers.

As noted, the majority of data collection took place in the Fall of 1991. At that time, financial data for November were only partially available while no information was available yet for December. Therefore, the data for 1991 is truncated and includes only the year's first three quarters. The evaluation, therefore, is a seven-quarter analysis (1.75 years) of the financial operations of the two health centers.

One of the main benefits of this evaluation will be the information it furnishes to the new managers of the two health centers. As this is written, they are struggling to maintain health center operations in the absence of MAP subsidies. A focus on the most recent seven quarters of operation potentially will provide important technical inputs into the up-coming decisions that will affect the centers' financial viability.

3.0 FINANCE STRUCTURE OF THE HEALTH CENTERS

Despite the fact that the Solanda and Marcabelí centers are modest facilities providing very basic health services, their financing during the period of study is complex. The main sources of financing consisted of combinations of fees and charges to clients, MAP subsidies, local and national government subsidies, and in the case of Marcabelí, community organization subsidies. The financing mix was different depending on the cost center. Exhibit 1 shows the financing mix for the Solanda Health Center in 1991. The finance sources are arranged by approximate value of contribution to cost center income, and refer to operating expenditures only.

Exhibit 1
Sources of Financing: Solanda Health Center, 1991
(by Cost Center and Date of Start-Up)

Finance Source	Cost Center	Solanda Health Center
1. Ministry of Public Health 2. MAP 3. Fees for Service 4. Fundación Mariana de Jesus	Medical Clinic (September 1988)	
1. Fixed Charges 2. MAP 3. Ministry of Public Health	Pharmacy (June 1989)	
1. Fixed Charges 2. MAP	Laboratory (February 1989)	

The exhibit shows that financing Solanda operations in 1991 was dependent upon several sources, and that the role of fees paid by clients differed across the cost centers. Fees paid by clients, for example, were the third most important income source for the medical clinic, while they were the major source of income for the pharmacy and laboratory. Overall, MAP subsidies and direct payments were the major sources of financing in 1991, followed closely by fees charged to clients and Ministry of Public Health (MSP) contributions. The MSP contributions covered the salaries and benefits of physicians and nurses assigned to the center. The *Fundación Mariana de Jesus* is listed as a source for the medical clinic because it made small donations of medical supplies in prior years. The Ministry of Public Health appears as a financing source for the pharmacy because the health center received small amounts of medicine on credit from government drug programs.

The Marcabelí Health Center also had a mix of financing sources. However, unlike the Solanda Health Center, Marcabelí received the majority of its financing from fees paid by clients. Exhibit 2 depicts financing sources for Marcabelí in 1991.

Exhibit 2
Sources of Financing: Marcabelí Health Center, 1991
 (by Cost Center and Date of Start-Up)

Finance Source	Cost Center	Marcabelí Health Center
1. Fees for Service 2. Donations	Medical Clinic (August 1988)	
1. Fixed Charges 2. MAP 3. Donations	Pharmacy (June 1989)	
1. Fixed Charges 2. Municipal Government 3. MAP	Laboratory (February 1989)	

Marcabelí relied more upon fees charged clients than did Solanda, particularly in 1991. MAP was a financing source for the pharmacy and laboratory, while the local Health *Comité* donated resources generated through community activities such as bingo games. The Municipal Government became an increasingly large source of financing for the Marcabelí Health Center, especially in 1991. The *Comité* prevailed upon the local government to supplement salaries and cover several minor expenses. In addition, the Municipality used provincial government allocations to purchase some new equipment for the laboratory. These contributions were received in the fourth quarter of 1991.

4.0 LEVELS OF COST RECOVERY

The principal objective of the MAP-USAID health care project was to test the feasibility of recovering all or a portion of the costs of private health centers through fees charged to clients. This evaluation focuses on three main levels of cost recovery:

1. **Recovery of Operating Costs.** Operating costs include the weekly and monthly costs of operating the centers: salaries, supplies, maintenance, rent, utilities, insurance, and any other recurring cost. Operating costs do not include the costs of capital equipment. Operating income includes the fees and charges paid by clients, any interest on bank accounts, and donations. Operating income in this study *does not* include any subsidies defined as cash operating grants, and labor or supplies paid for by third parties. The percentage of operating costs paid for by operating income is the level of cost recovery. A level of 100 percent cost recovery would mean that the center is covering its day-to-day expenses through income essentially generated from client payments.

2. **Recovery of Operating and Capital Costs.** Both centers incurred capital expenditures for medical equipment, furniture, office equipment, and appliances, among others. These expenditures are identified, depreciated on an annual basis, and added to operating costs to obtain annual or quarterly financial costs. These costs are the most accurate estimate of total costs, and therefore yield the clearest long-term picture of financial sustainability of the centers. [Note: Capital expenditures refer to the outlays at the time of the purchase of the capital good. Capital costs are the annuitized costs of the capital expenditure according to a depreciation schedule.]

3. **Recovery of Operating, Capital, and Technical Assistance Costs.** A final level of cost recovery estimate includes the costs of MAP technical assistance. This assistance was substantial in the early years of site selection, community negotiations, and start-up. In 1990 and 1991, however, direct technical assistance to the centers declined to a mere fraction of MAP's total project costs. The cost of this technical assistance is discussed at the end of this section.

Unless otherwise indicated, the figures that form the basis of the following analyses are found in the Annex Exhibits.

4.1 Recovery of Operating and Capital Costs: Solanda

The health centers at Solanda and Marcabeli are not high-cost operations. They are, in fact, rather modest, even by Ecuadorian standards. The Solanda Health Center is the higher-cost of the two facilities. Exhibit 3 is provided here to give an idea of the size of the financial operations of the two health centers. It displays Solanda's operating income and costs, and capital costs for the first three quarters of 1991. It shows that the health center operated on less than \$U.S. 5,000 per quarter.

Exhibit 3
Operating and Capital Costs: Solanda Health Center, 1991
 (Current Suces)

	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Operating Income	838,779	1,276,207	2,149,614	n.a.	4,264,600
Operating Costs	3,003,845	4,445,028	4,160,409	n.a.	11,609,282
Operating Gain(Loss)	(2,165,066)	(3,168,821)	(2,010,795)	n.a.	(7,344,682)
Capital Costs	771,112	771,112	771,112	n.a.	2,313,336
TOTAL GAIN (LOSS)	(2,936,178)	(3,939,933)	(2,781,907)	—	(9,658,018)

Source: Annex Exhibit 1. During this year the exchange rate averaged 931 sucres per dollar.

As can be seen from Exhibit 3, Solanda operated at a considerable loss to operating income in 1991. Exhibit 4 provides the level of operating and capital cost recovery at the Solanda Health Center for the whole time period under study (January 1990 - September 1991). These percentages are extracted from Annex Exhibit 1. Operating cost recovery figures are important for analyzing the short term prospects for the health center. Since most capital expenditures covering the short-term have been made, operating cost recovery figures provide the clearest short-term financial picture to the current managers of the center.

Capital expenditures, mostly in 1988 and 1989, were covered by MAP subsidies. As such they are not real operating or capital costs to the health center. They are, however, economic costs that must be taken into account in analyzing the financial viability of the operation. Eventually, capital expenditures will need to be made, and it will be essential for the managers to understand their impact on operations.

Exhibit 4
Percent of Costs Recovered by Quarter: Solanda Health Center, 1990-91
 (Current Suces)

Cost	Q1	Q2	Q3	Q4	1990	Q1	Q2	Q3	1991
Operating	36.5	54.3	48.0	36.4	43.0	27.9	28.7	51.7	36.7
Operating & Capital	29.9	40.4	35.9	26.8	33.0	22.2	24.5	43.6	30.6

Exhibit 4 shows that the Solanda Health Center recovered 43.0 percent of its operating costs in 1990 and 36.7 percent of its operating costs in the first three quarters of 1991. With capital costs taken into account, the recovery

percentages fall to 33.0 and 30.6 percent respectively for the two periods. Expressed in more simple terms, for each 10 sucres spent by the center, six had to be provided as subsidies. This high level of subsidy occurred after three full years of efforts to make the center financially self-sufficient.

While the overall levels from year to year are similar, the variations from quarter to quarter are considerable. In two of the seven quarters, the level of operating cost recovery was over 50 percent, while in two others, the level was under 30 percent. No upward or downward trends in cost recovery are apparent at Solanda. Variations across quarters are explained mainly by changes in center income levels. For the last three quarters of 1990, costs remained static in current sucres. For the first three quarters of 1991, costs rose steadily (See Annex Exhibits 5 and 6). In contrast, the center's income declined steadily throughout 1990. It began to rise in 1991, reaching its highest level in the third quarter (See Annex Exhibits 3 and 4). The reasons for these fluctuations in income are related to pricing policies, the temporary shutdown of the Solanda pharmacy, and other factors that will be discussed later in the section on "Analysis of cost Recovery Performance".

4.1.1 Levels of Cost Recovery by Cost Center: Solanda

The levels of cost recovery varied considerably across cost centers. As noted, the Solanda Health Center has three cost centers — the laboratory, the pharmacy, and the medical clinic. Exhibit 5 details the levels of cost recovery for 1990 and the first three quarters of 1991.

Exhibit 5
Percent of Costs Recovered By Cost Center: Solanda, 1990-1991

Cost Center	1990	1991
Laboratory:		
Operating	69.9	69.2
Operating and Capital	42.1	47.4
Pharmacy:		
Operating	74.9	33.1
Operating and Capital	59.9	29.0
Medical Clinic:		
Operating	25.1	19.9
Operating and Capital	22.5	18.4

Sources: Annex Exhibits 3, 4, 5, 6.

In terms of recouping operating costs, the laboratory clearly fared the best of the three cost centers with its seven quarter results showing about 70 percent recovery. The laboratory has the highest capital costs. When these are taken into account, the level falls to about 45 percent over the two periods. The pharmacy did well in 1990 with a rate of 75 percent of operating costs recovered, but it faded to only 33 percent in 1991. This latter figure was due to the virtual shutdown of the pharmacy in the first part of the year.

The lowest level of cost recovery occurs with the medical clinic. It recovered 25 and 20 percent of its operating costs respectively in the two periods studied. These low figures are due to pricing policies, the internal inefficiency of medical clinic operations, and possibly low demand for services. These issues will be explored later in this report.

4.2 Recovery of Operating and Capital Costs: Marcabelí

The Marcabelí Health Center, consisting of a laboratory and pharmacy only, operated on less than \$U.S. 1,500 annually in 1990 and 1991 (See Annex Exhibit 2). Marcabelí's figures contrast sharply to those of Solanda. This is not surprising since, for most of its existence, Marcabelí only offered laboratory and pharmacy services which tend to produce higher income at lower costs than medical clinic visits. Exhibit 6 depicts the levels of cost recovery for the Marcabelí Health Center, excluding the recently established medical clinic.

Exhibit 6
Percent of Costs Recovered by Quarter: Marcabelí Health Center, 1990-91*
(Current Suces)

Cost	Q1	Q2	Q3	Q4	1990	Q1	Q2	Q3	1991
Operating	46.0	41.5	62.7	79.9	65.2	116.3	89.5	123.8	107.8
Operating & Capital	26.0	29.5	50.3	69.0	50.8	85.7	77.1	105.1	89.4

Sources: Annex Exhibits 7, 8, 9, 10.

* Laboratory and pharmacy only.

Not only are Marcabelí's cost recovery levels higher than Solanda's, but there is a clear trend toward higher proportions of costs recovered. In 1990, the laboratory and pharmacy recouped 65 percent of operating costs. For the first three quarters of 1991, the figure jumped to over 100 percent. Recovery of operating and capital costs follows a similar trajectory. In the first two quarters of 1990, the center recouped less than 30 percent of total costs. By the first two quarters of 1991, the figure had increased to about 80 percent. By the third quarter of 1991, the center was recovering more than 100 percent of its total costs.

Marcabelí's success in recovering costs is due to a pattern of continuously increasing revenues accompanied by lesser increases in labor and supply costs. In addition, capital costs in Marcabelí are much less than in Solanda, which also improves the financial picture.

Exhibit 7 breaks down the levels of cost recovery by cost center for Marcabelí.

Exhibit 7
 Percent of Costs Recovered By Cost Center: Marcabelí, 1990-1991

Cost Center	1990	1991
Laboratory:		
Operating	53.6	98.5
Operating and Capital	34.9	65.1
Pharmacy:		
Operating	75.1	111.7
Operating and Capital	70.3	104.0

Sources: Annex Exhibits 7, 8, 9, 10.

In 1990, both the laboratory and the pharmacy recovered significant portions of their operating costs. For 1991, both cost centers had moved to self-sufficiency in terms of covering operating costs. The pharmacy, with its low capital costs, reached self-sufficiency in 1991 in terms of operating and capital costs, and even generated a slight profit. The laboratory, however, with its high capital costs, recovered only 65 percent of its operating and capital costs in the first three quarters of 1991.

It is important to note that all of the capital expenditures at Marcabelí were incurred by MAP or the Municipality largely before 1990, so that the depreciation costs in 1990 and 1991 represent *economic costs* to the center and not direct *financial costs*. Capital expenditures should be relatively low over the next several years, so the center's financial viability appears on the surface to have a good foundation.

Marcabelí did not offer medical consultations until late 1991, and there are not data available to assess performance. However, it is worth noting that from the perspective of the center, the Marcabelí medical clinic at a minimum recovered its own operating costs. The physician who provides the medical services acts as an independent business, only using the center to see patients and collect fees. Costs incurred by the health center for the medical clinic are virtually non-existent, since the center is open anyway for the laboratory and pharmacy, and the clinic occupies a small space twice a week. In a sense, the medical clinic is "contracted out" at no cost to the center. Further, the medical clinic enhances income from the other cost centers whose revenues tend to increase on the days the physician is seeing patients. (Overhead costs would ideally be allocated to the physician but little is known about his activities, and he only worked a few days in the third quarter of 1991, the last quarter of this study.)

In sum, the two cost centers at Marcabelí achieved their goal of reaching financial self-sufficiency in relation to operating costs. In reaching this goal, Marcabelí made steady incremental gains in the proportions of costs recovered. In addition, the structure of Marcabelí's modest medical clinic makes it most likely a self-sufficient cost center. This contrasts to the Solanda experience, in which the pharmacy suffered a severe decline in cost recovery from 1990 to 1991, and the laboratory maintained a steady level of about 70 percent. The medical cost center at Solanda experienced a very low and declining rate of cost recovery over the period.

4.3 Recovery of Operating, Capital, and Technical Assistance Costs: Solanda and Marcabelí

MAP technical assistance costs are based largely upon estimates. These estimates were derived by netting out from MAP's total project expenditures all direct payments and subsidies to the health centers. The remainder is comprised of MAP direct expenses for staff, supplies, office rents, benefits, travel expenses, and indirect expenses. MAP staff estimated that 10 percent of all project expenditures went to direct technical assistance to the Solanda and Marcabelí Health Centers. The 10 percent is divided between Solanda (seven percent) and Marcabelí (three percent). These amounts are again divided equally at the facility level among the cost centers, according to MAP staff. Direct observation by the authors supported this estimate.

MAP technical assistance included training health center staff in accounting methods, inventory control, and computer use, among others. In addition, MAP assisted in making administrative decisions, worked with local community organizations, and generally helped oversee health center operations. By late 1991, when the authors of this study observed health center activities first hand, it appeared that the local staff could carry out all health center functions without technical assistance. Exhibit 8 shows the levels of cost recovery when technical assistance is taken into account for both health centers.

Exhibit 8

Percent of Total Costs Recovered Including Technical Assistance: Solanda and Marcabelí Health Centers

Year	Solanda	Marcabelí
1990	25.1	36.2
1991*	26.1	78.8

* First three quarters only.

Not surprisingly, when the expense of technical assistance is added to the cost recovery equations, the levels of recovery fall even further. Solanda only recovered a quarter of its costs plus technical assistance in both years. Marcabelí, with its excellent performance in 1991, recovered nearly 80 percent of its operating, capital, and technical assistance costs.

Figures which take technical assistance into account are not particularly significant, since the managers of the health centers had no control over these expenditures, and since it is questionable how much the technical assistance in the later years of the project contributed to productivity. In addition, the technical assistance offered by MAP during the period under study represented a daily on-site expense. It is quite possible that the health centers could have obtained similar short-term technical assistance from the local market at a much lower price. The cost recovery figures for operating and capital costs, then, are most likely the best gauge of the financial viability of the health centers.

The MAP Project will have spent over \$U.S.700,000 during its six-and-a-half year existence. Health services were initiated in Solanda three years after the project started. In Marcabelí, the laboratory was opened three-and-a-half years after the project started. The majority of project expenditures occurred before any health care services were offered to the inhabitants of Solanda or Marcabelí. Approximately 60 percent of project funds were spent by the end of 1988, according to the authors' analysis (Technical Note on "Project Expenditures"). These funds are treated in this study as "sunk costs" incurred before direct expenditures on the health centers. If they were amortized over the life of the project, it would reduce cost recovery levels to a mere fraction.

In the final two years of the project, MAP spent approximately \$U.S. 11,000 on technical assistance and \$U.S. 14,000 on direct subsidies to the health centers. If similar amounts of funds were spent by MAP on technical assistance and direct subsidies in 1989 and 1988, MAP would have spent approximately \$U.S. 50,000 on the Solanda and Marcabelí Health Centers during the life of the project. The remainder went to community education activities.

5.0 ANALYSIS OF COST RECOVERY PERFORMANCE

The overall objective of the MAP health financing project was to offer quality health services to low-income groups while achieving the maximum possible recuperation of costs. The original intent in the MAP proposal and the project grant agreement was clearly that the health centers would be operating without subsidy. By the last year of the project, however, USAID had expanded the definition of self-sufficiency to mean "services which are supported through service charges, government participation and other contributions...." (USAID 1990).

5.1 The Solanda Health Center: Reasons for Low Levels of Cost Recovery

In the context of the original definition of self-sufficiency, the Solanda Health Center fared poorly recovering only about one-third of its costs in the last two years of the project. If government subsidies are considered as "income generated," the level of cost recovery improves.

The following is an analysis of major reasons that the Solanda Health Center performed at a relatively low level of cost recovery during the two-year period under study. It includes a recalculation of cost recovery levels for 1991, taking into account government contributions. The section concludes with some recommendations.

5.1.1 Irregularity of Services Reduced Income Potential

The flow of income to the Solanda Health Center varies so much over time that it suggests that services may not have been offered in a uniform manner over the months, which adversely affected income. Total revenue declined in 1990 by 38 percent in current sucres from the first to the fourth quarter of the year. This occurred largely as a result of a decline in income from the pharmacy and the medical clinic.

The pharmacy, which had sold nearly 400,000 sucres worth of drugs in the first quarter of 1990, sold nothing in the fourth quarter. Certain personnel problems in operating the pharmacy apparently occurred during this period. The pharmacy was not staffed from about October 1990 to February 1991. In addition, few pharmaceutical purchases took place in the last two quarters of the year. A fully staffed pharmacy in 1990 could have resulted in a close to break-even situation for the year.

Similar personnel changes occurred with the staff of the medical clinic. Not only was there staff turnover, but at least one staff member was paid by different sources from month to month. In this case, a nurse who had been paid by MAP through a temporary agency was switched over to the Ministry of Public Health payroll. She was not fully paid for approximately four months, receiving only small payments, and no benefits. Such problems may have resulted in interruptions in service. In September of 1990, for example, the number of patients seen for the month dropped to 165. The previous eight months had averaged 437 patients per month.

Finally, the laboratory technician was paid under different payment schemes. First, he received a salary. In late 1990, his income was switched to a percentage of the gross revenues from examinations. This turned out to be unsatisfactory, and he went back on salary in early 1991. At about the time that he reverted to a salary basis, his hours were reduced from eight to six per day — a cut of 25 percent in working time with no apparent corresponding reduction in salary. This reduction in working time may have contributed to lower than normal laboratory revenues.

5.1.2 Price Structure Reduced Income Potential

The Medical Clinic. The principal cause of Solanda's low level of cost recovery is related to the prices charged in the medical clinic; sixty-three percent of Solanda's deficit in 1991 came from the medical clinic. Almost all patients were charged a single fee for being seen by a physician. Other higher fees were charged for special visits such as emergencies. However, these special visits were a fraction of the total number of visits, amounting to less than 10 percent of all visits.

From the opening of the health center in September 1988 until May of 1991, the charge for a physician consultation was 200 sucres. In June of 1991, the fee was raised to 400 sucres where it remained until the end of the project. During the period September 1988 to June 1991, while the price of a physician visit remained static, the consumer price index for low- and middle-income families rose by 241 percent (Banco Central del Ecuador 1991). By December 1991, the consumer price index had risen by at least another 25 percent more. Unlike most public and private institutions in Ecuador, the Solanda Health Center did not benefit from price increases commensurate with inflation. On the other hand, costs, including salaries, supplies, and utilities did increase at rates close to inflation.

The initial price of a physician visit in 1988 was very low by Ecuadorian standards. Had there been quarterly inflation adjustments in the price of a visit, medical clinic revenues would have been 66 percent higher in the second quarter of 1991. The level of cost recovery for the medical clinic would have risen from 15.5 to 25.2 percent assuming no change in demand.

The core problem in pricing, however, was not just a matter of pegging prices to inflation. The core problem was that the initial price was set too low for any possibility of substantial cost recovery. A consultation price of 200 sucres in 1988 was equal to about 20 percent of the lowest private sector price at the time. By the end of the project, even though there had been a doubling of the price to 400 sucres, the fee for a consultation was still a fraction of the private sector price. Exhibit 9 shows the price of a Solanda medical clinic visit, the price of a visit to the nearest private doctor, and the price of a visit to another PVO health center.

Exhibit 9
**Price of a General Medical Consultation in Barrio Solanda,
 October-December 1991 (Current Sucres)**

Solanda Health Center	Private Doctor 1	Private Doctor 2	Private Doctor 3	Private Doctor 4	Centro Medico Tierra Nueva**
400	2,500	2,000	1,500 - 2,500*	4,000	1,000

* Price is determined by unknown means testing mechanism.

** PVO health center located in barrio next to Solanda.

In December of 1991, the last month of the project, the basic charge at Solanda was only 40 percent that of a nearby PVO clinic. In comparison to private doctors in the neighborhood, Solanda charged about 20 percent of the going private rate. It was the decision of the health center management to charge a flat rate to all clients with no exceptions. This precluded any opportunity to charge a higher consultation fee to some patients while exempting the poorest clients through some form of means testing. Charging 1,000 sucres per visit in the Fall of 1991 (or about 50 percent of the private price), and exempting 20 percent of all clients would have increased revenues by 100 percent assuming no fall in demand. Under this scenario, the medical clinic would have approached breaking even on operating costs if the costs of the government-provided physician and nurse are not included in the equation.

In any case, it is obvious that the prices charged at the Solanda Health Center were far lower than the lowest charges of any alternative fee-for-service providers. As a comparison to other prices, a newspaper costs between 250 and 300 sucres. A pack of cigarettes costs 1,000 sucres. Therefore, the price of a medical consultation at Solanda in late 1991 was equal to the price of eight cigarettes, and slightly more than the price of a newspaper. Why were prices set so low?

Community Objections to Fee Charging. From the initiation of discussions with the Ministry of Public Health and the community organizations, there were strong objections to fee charging. Long before the opening of the clinic doors, the Ministry, which had to approve the project, objected to the charging of fees. The Ministry, borrowing a decree which pertained to public clinics only, informed MAP that the law guarantees free services to the population (MAP 1986).

The cry against fee charging was taken up by community organizations and the *Fundación Mariana de Jesus*, which was to provide the health center facility. Thus, throughout the life of the project, MAP was pressured to keep fees at a very low level. Only toward the very end of the project, when the community began contemplating the financial sustainability of the health center, were prices at the medical clinic raised. It is the authors' understanding that the Solanda Parish, which took over the health center in late December 1991, raised medical clinic fees substantially on January 1, 1992. Clearly, the financial performance of the Solanda Health Center would have been much improved with a price structure more in line with local markets, and some form of means testing to exempt the truly poor.

The Pharmacy. Pharmacy prices at Solanda are approximately 10 percent less than at nearby commercial pharmacies. The Solanda pharmacy is only stocked with basic drugs and does not have the selection of neighboring commercial pharmacies. Prices are probably set about as high as they can be without driving clients to the nearby pharmacies. Sales volume is unlikely to be expanded because of an enforced prescription requirement.

The Laboratory. The laboratory charged slightly less than the going fees at competing facilities. The average charge at Solanda in October 1991 for 17 different examinations was 1,006 sucres. The average charges at two nearby private laboratories were 1,147 and 1,565 respectively. A PVO laboratory in the next *barrio* had an average charge of 1,135 sucres for the same set of tests. Blood tests are the most common form of laboratory exam, making up more than half of all tests at Solanda. There is virtually no difference in the prices of blood tests among Solanda, one private laboratory, and the other PVO laboratory. The parasite exam, for example, which accounted for 46 percent of all exams at Solanda, had a price of 500 sucres in all four facilities surveyed. Prices therefore do not seem to have been a factor in the inability of the laboratory to recoup all of its operating costs.

5.1.3 Competition Reduced Income Potential

When the Solanda Health Center opened its doors, observers report that there were no private physicians practicing in the *barrio*. Three years later there were at least five or six storefront doctor's offices with at least one new one ready to open. In the next *barrio*, there are other storefront doctors, a Ministry of Public Health clinic, and a PVO clinic. Finally, there are at least four pharmacies within a 10-minute walk of the health center. The Solanda Health Center, therefore, faced considerable competition from these other facilities in 1990 and 1991.

Solanda's laboratory and pharmacy prices were within 10 percent of the competition, on average. In contrast, its medical clinic prices were drastically lower than the competition's. In light of the low price of a physician visit at Solanda, it is curious that the facility was not inundated with patients, especially given its underused capacity (See the following section on "Project Design"). This study did not investigate quality of care at Solanda, but this is one conceivable explanation of why people stay away from clinics. Another explanation may have been the image of the health center in the community. Crespo's study (1991) on community factors in the MAP-USAID project sheds light

on this issue. It is also possible that the poorest people in the community went to the free Ministry of Public Health clinic in the next *barrio*. Finally, it is clear that many people who could pay went to private physicians, and these private physicians may have offered discount prices to the lowest income families. In any case, the existence of competing and presumably more desirable alternatives for many of Solanda's inhabitants had a dampening effect on the health center's revenues.

5.1.4 Project Design May Have Reduced Productivity and Income Potential

Internal Efficiency. Stated in simple business terms, income or even profit is highly dependent on how efficiently inputs are applied to an activity. An inefficient application of inputs lowers the value of income and limits profit potential. In health care, a key efficiency measure is staff productivity, since labor is usually the most expensive input. Solanda's financial picture appears to have suffered from inefficiencies in productivity due to staffing patterns.

In the first quarter of 1990, the medical clinic received 1,434 visits. In no subsequent quarter over the next two years did the number of visits exceed this number (See Annex Exhibit 14). In several months during its history, the clinic saw over 500 patients, with a high of 675 in September 1989. Assuming a similar staffing configuration over time, therefore, the clinic must have operated under capacity for much of the time. Indeed, for at least the second half of 1991, there were two physicians and one registered nurse on duty at the health center. The physicians worked four-hour shifts for a total coverage of eight hours per day. The average daily patient load during this six month period was 17. Therefore, if the physicians adhered to their duty hours (which they generally do), they were seeing on average two patients per hour.

Since four patients per hour is a minimum standard in Ecuador, it is possible that the medical clinic was operating as much as 50 percent under its capacity. Incidentally, the health center administrator stated that the capacity of the medical clinic was 30 patients per day, or an amount nearly identical to four patients per hour.

Large shifts in the cost per patient visit in the medical clinic also suggest mismatches between staff labor and the demand for services. Annex Exhibit 14 shows that the total cost per patient visit varied between 943 and 1,928 sucres during the seven quarters under study—a surprising 100 percent difference. The average total cost per visit in the first three quarters of 1991 was about 1,800 sucres — an amount very close to the private charge for a physician visit, as indicated earlier in Exhibit 9.

Regarding the pharmacy, the great majority of its clients (90 percent, according to the administrator) are referrals from the medical clinic. A prescription is required, which limits the clientele to those who have just seen a health center doctor, or those few who receive prescriptions from private doctors. Most pharmacies in Ecuador derive their main revenues from self-prescribing patients and the sales of non-pharmaceuticals such as soap, face creams, and over-the-counter drugs. Since the Solanda pharmacy sells only basic drugs, and a prescription is required, the pharmacy cannot expand its sales unless there is a large increase in the number of patients seen in the medical clinic. Under current circumstances, its only hope for financial self-sufficiency is to lower costs, which are already minimal.

The laboratory also had large fluctuations in the total cost per examination. It ranged from a low of 604 sucres to a high of 1,346 sucres per exam (based on an index of the most common exams) over the seven quarters under study (See Annex Exhibit 15). The highest number of laboratory exams took place in the second quarter of 1990. If we take this to be equal to the maximum production, then the laboratory operated 15 percent under capacity on average for the other six quarters. Unlike the pharmacy, the laboratory draws its clientele mainly through referrals from private physicians. It may have been possible to expand referrals through a minimal marketing effort.

Decision Making and Incentives. The final project design issue involves who made decisions and the types of incentives built into the health center operation. At Solanda, there was not a local person or organization that actually managed the operation, except for an on-site administrative assistant/pharmacy clerk). MAP staff made most of the key management decisions about health center staffing, training, equipment purchases, and other administrative matters. Thus, these decisions were not in the hands of the people directly responsible for the day-to-day operation of the health center. It is possible that an on-site business manager may have made less costly choices than did MAP staff. MAP on the other hand had access to large amounts of funds for subsidy with no day-to-day incentives to make the best possible financial choices. The Solanda Health Center vehicle is an example of this. This vehicle reverted to the health center at the conclusion of the project. It cost tens of thousands of sucres to maintain and repair each year. Operating independently, the health center would have saved considerable operating expenses by using inexpensive local transportation (taxis and buses) for its needs.

Finally, the records show no evidence that MAP collected or analyzed information on utilization or productivity. Information generated and reported to USAID on cost recovery performance compared income with salaries paid by the health center and no other costs. This procedure gave inflated results for Solanda's cost recovery outcomes. Using standard accounting methods to measure cost recovery, and collecting and analyzing data on utilization and productivity could have helped MAP make decisions that would have improved efficiency and cost recovery performance.

5.1.5 Cost Recovery Performance Improves With Government Contribution

In 1991, MAP and the Solanda Health Center succeeded in obtaining a physician and a nurse from the Ministry of Public Health. These two staff were on the payroll of the Ministry and were provided free-of-charge to Solanda to work in the medical clinic. The salary and benefit costs assumed by the Ministry amounted to approximately 50 percent of the total cost of the medical clinic in the first three quarters of 1991. If we use USAID's redefinition of self-sufficiency which places government subsidies in the same category as income from fees and sales (USAID 1990), the level of cost recovery for the medical clinic and the health center improves dramatically.

When total economic costs are taken into account, cost recovery in the Solanda medical clinic was 18.4 percent of total costs in 1991. When the Ministry subsidy is added to the cost side of the equation, the level of cost recovery jumps to 71.1 percent (Annex Exhibits 4 and 6). Further, in 1991, MAP entirely subsidized the rent for the health center site, which is paid to the *Fundación Mariana de Jesus*. With the transfer of the health center from MAP to the Solanda Parish, the authors understand that no rent will be charged in 1992. Without the rent expense in the first three quarters of 1991, total cost recovery for the medical clinic would have increased to 76.4 percent.

Finally, the Solanda Health Center will have few if any capital expenditures in the next three or four years, and as noted, most capital expenditures were paid by MAP in 1988/89. Without capital expenditure costs, rent payments, or Ministry subsidies taken into account, the medical clinic cost recovery level for 1991 would have been 56.1 percent. Higher consultation fees or higher productivity may have enabled the medical clinic to approach break even in 1991 under this discounting method of cost analysis.

5.2 The Marcabelí Health Center: Reasons for High Levels of Cost Recovery

The analysis of Solanda performance explained reasons for its low levels of cost recovery. Since Marcabelí experienced much higher levels of cost recovery, this analysis will focus on the reasons for its success. Marcabelí's success derived from a variety of sources which are discussed below. These are followed by a discussion of areas of concern for Marcabelí as the health center proceeds on its own in 1992 and beyond. It is important for the reader to note that the **Marcabelí Health Center was comprised of a laboratory and a small pharmacy with no medical clinic.**

5.2.1 Low Wages, Long Hours

The laboratory technician and the pharmacy clerk earned minimal wages at Marcabelí. These lower wages occur because no benefits are paid at Marcabelí, and salaries are lower relative to Solanda. This reduces labor costs in the Marcabelí laboratory by approximately 43 percent (Annex Exhibits 5 and 9). Marcabelí's total salary costs for the laboratory in 1990 were 730,000 sucres while Solanda's were 1,288,000 sucres for about 10 percent less labor. In the pharmacy, the clerk worked for all of 1991 at less than the minimum wage.

Not only are wages lower, but Marcabelí employees put in longer hours. The laboratory technician worked eight hours a day, compared to six hours at Solanda in 1991. Further, the laboratory is open Wednesday through Sunday. This enables the laboratory to serve clients who cannot come to the health center on weekdays. This practice captures all the rural clients who come to town on the weekends to conduct their business. Finally, the pharmacy clerk works a full *seven days a week* at Marcabelí. These longer hours translated into higher income potential, especially for the pharmacy.

Marcabelí's pharmacy prices were identical to those of Solanda. The laboratory's prices were somewhat less than those of Solanda but not enough to off-set the advantages of significantly lower wages at Marcabelí. Exam prices at Marcabelí averaged somewhat less than those at Solanda in 1990. For the first two quarters of 1991, prices were actually higher at the Marcabelí laboratory (See Annex Exhibits 15 and 16).

5.2.2 Efficient Administration

Another factor that lowers labor costs at Marcabelí is the absence of an on-site administrator. In Marcabelí, the laboratory technician and the pharmacy clerk handle much of the administrative work (receiving and recording payments, writing receipts, registering patients, ordering supplies, among other things). The local *Comité de Salud* (health committee) keeps a general ledger for the health center.

5.2.3 Low Capital Costs

The Marcabelí Health Center is a lightly capitalized operation compared to Solanda. The facility is smaller, and requires less furniture, office equipment, and appliances. In addition, MAP seems to have made minimum capital expenditures in Marcabelí compared to Solanda. Capital costs for the Marcabelí laboratory, for example, were 58 percent less than Solanda in 1990.

5.2.4 Project Design Encouraged Community Involvement and Financial Self-Sufficiency

A number of factors in the design of the Marcabelí Health Center favored high levels of cost recovery. One of the most important was the high degree of local control over health center operations. As noted, the Marcabelí health committee made most of the key decisions about operations, with advice from MAP staff. The authors observed a strong sentiment of financial responsibility for the center on the part of the health committee members. This sense of ownership and responsibility brought serious deliberation to any decisions about the financial condition of the health center. MAP reinforced this sense of responsibility by limiting the funds available for subsidy. This may have caused the health committee to be more innovative and efficient than they otherwise would have been with more liberal subsidies. Direct subsidies paid by MAP in the first three quarters of 1991 were a fraction of those paid by MAP to Solanda during the same period, .2 vs. 4.7 million sucres (Annex Exhibits 4 and 8).

The Marcabelí *Comité* endeavored to raise funds through community activities. In November 1990, the *Comité* contributed 238,000 sucres it had earned from a bingo game it sponsored. The *Comité* made a similar contribution in late 1991 as a result of a community dance. Besides raising funds through the community, the health center employees and the *Comité* undertook promotional activities for the laboratory by visiting schools and offering volume discounts for required annual school lab tests. Other discount "specials" were occasionally offered to stimulate demand.

The Marcabelí pharmacy, unlike its Solanda equivalent, did not have a prescription requirement. In addition, it sold over-the-counter products and drug store sundries, which significantly expanded its sales volume, even though it was a much smaller operation than Solanda. Because of these factors and longer hours of operation, Marcabelí sales volume out-performed Solanda's by a margin of 130 percent in the first three quarters of 1991 (Annex Exhibits 4 and 8).

Both Solanda and Marcabelí experimented with incentive payments to employees in lieu of salaries. After several months' trial at Solanda, MAP abandoned a scheme whereby the laboratory technician received a portion of his pay from gross laboratory receipts. The Marcabelí health committee instituted incentive schemes for the laboratory and the pharmacy which were in effect from August 1990 to the end of 1991. The Marcabelí incentive system (a base pay plus a percent of gross) probably contributed to the health center's cost recovery performance, especially in the pharmacy, where the clerk voluntarily extended the hours of operation to increase sales potential.

Like Solanda, the Marcabelí Health Center sought other sources of support beyond the fees and charges paid by clients. The center was successful in attracting financial support from the Municipality of Marcabelí, which began to pay a base salary to the laboratory technician in late 1990. In addition, the Municipality made a major contribution in late 1991 to upgrade laboratory equipment. If these municipal contributions are counted as operating income (as in the 1990 USAID revised definition of self-sufficiency), operating and capital cost recovery reaches nearly 100 percent for 1991 (Annex Exhibits 8 and 10).

Reasons to Be Cautious About Marcabelí's Financial Condition

Although Marcabelí's performance in 1991 should be cause for optimism about the future of the health center, several factors raise some question about its long-term viability:

First, Marcabelí had the same problem with pricing as Solanda. In the laboratory, it held prices constant for a two-and-a-half year period despite rises in the costs of reagents. To succeed, Marcabelí's laboratory exam prices will have to be more sensitive to inflation.

Second, Marcabelí's laboratory appears to be operating far under capacity. The records show that the laboratory technician can easily handle 10 patients per day. There are numerous days in the history of the laboratory when more than 10 patients were tested. The average number of patients seen for the seven-quarter period under study was approximately 6.0. For a three-week period in November

1991, during field work for this study, the laboratory averaged only 3.5 patients per day. Because of erratic patient flow, the costs per laboratory patient vary considerably over time. The average operating cost per patient in the third quarter of 1991 was 173 percent higher than in the previous quarter (see Annex Exhibit 16). Marcabelí's laboratory will have difficulty managing if such fluctuations in costs per patient persist. A more steady flow of patients would alleviate this potential problem.

Third, Marcabeli faces potentially stiff competition from local pharmacies. There are three pharmacies within two blocks of the Marcabelí Health Center. More serious is a new laboratory 15 minutes away in Balzas which was scheduled to open in early 1992. The closest 1991 competition was a two-hour bus ride away. This new laboratory could draw off large portions of Marcabelí's laboratory patients, since many of them come from Balzas, and the new laboratory will be offering more sophisticated tests. Any decline in the laboratory's patient volume would have dire consequences for Marcabelí.

Fourth, the salaries and incentives paid at the Marcabeli Health Center may be too low to be sustainable. As noted, the pharmacy clerk made less than the minimum wage, yet worked close to 60 hours a week. The laboratory technician, a skilled professional, made only twice the minimum wage on average in 1991. Both employees suffered large decreases in real wages in 1991, thanks to 50 percent inflation and constant salaries. This wage structure most likely cannot be sustained and will require significant adjustment if the center hopes to retain its employees. With a 50 percent wage adjustment, Marcabelí's operating cost recovery would have slipped in 1991 from 108 percent to 94 percent. Operating and capital cost recovery would have dropped from 89 to 80 percent.

Fifth and finally, despite technical assistance from MAP in accounting, the Marcabeli Health Center and the local health committee lack basic financial planning capability. At the time of the authors' visit in late 1991, just days before the final transference of the equipment from MAP to the center, there were no budgets for 1992 and the Committee had little notion of its financial condition for the coming year.

6.0 ASSESSMENT OF THE SOCIOECONOMIC CHARACTERISTICS OF URBAN CLIENTS AT SOLANDA

The Solanda barrio has a population of approximately 30,000 people. The Solanda Health Center received on average 7,500 visits per year to its medical clinic and laboratory (Annex Exhibits 14 and 15). The majority of pharmacy visits were medical clinic patients. There is no way of knowing how many multiple visits there were from the same clients, so it is impossible to determine exactly how many people were served by the health center. The medical clinic registered 2,300 families over the course of the project. This would mean that at least one member of some 40 percent of Solanda households visited the health center.

The following information establishes some of the socioeconomic characteristics of the Solanda barrio and the clientele of the Solanda Health Center. The following analysis, based on different surveys of each population, shows that for the most part, health center clientele are representative of the entire community.

6.1 Income

The Solanda Health Center was planned and opened at the same time that the Solanda Housing Finance Project was in full operation. The project was approved in 1980, and by 1988, construction was complete with 5,746 units. Most were occupied by 1989. These housing units were targeted to low-income families who ranked in the lower half of Quito's income scale, that is, below the 50th percentile. Twenty percent of occupants were permitted to be outside of this range (PADCO, Inc. 1989).

The Ecuadorian Housing Bank (*Banco Ecuatoriano de Vivienda*) estimated that the 50th income percentile for Quito in 1988 was 53,112 sucres. At that time the maximum permissible income for housing applicants was 53,200 sucres, or about 3.7 times the minimum wage (PADCO, Inc. 1989). Another study in 1985 put the 50th percentile at the equivalent of 66,252 in 1988 sucres (World Bank 1990). If the Solanda applicants, in fact, had incomes at the 50th percentile or below, it would be possible to conclude that the Solanda barrio indeed was largely occupied by the lower income groups.

Another measure of low income is the level of poverty. A 1988 estimate put the poverty level at 2.8 times the minimum salary for a family of six (PADCO, Inc. 1989). The National Institute of Statistics and Censuses (INEC) has defined this level as the amount of monthly income necessary to purchase a basic food basket. Solanda's average family size is less than five, making the Solanda equivalent of poverty about 2.3 times minimum salary and below. The International Labor Organization (ILO) estimated in 1987 that 45.8 percent of family units in Ecuador's main urban centers, including Quito, lived in poverty (World Bank 1990). This includes 15 percent of the large urban population living in absolute poverty. Under these definitions, the majority of applicants to the Solanda housing project would have been living in poverty at the time of the application.

With these figures as background, we can examine the income data gathered from several later Solanda surveys. Three surveys provide data on income: PADCO's household survey in 1988 (1989), Rodriguez's household survey in 1989 (1990), and HFS's *Ficha* (Registration Card) survey covering three years (1989-1991). Exhibit 10 presents information on self-reported family income of the population in general, and Solanda Health Center users. These incomes are converted to sucres of June 1991 for comparative purposes. These income figures are then compared to the poverty income ceiling of 2.3 times the minimum salary.

Exhibit 10

**Average Self-Reported Monthly Income, and Poverty Ceiling:
Solanda Population and Health Center Users
(Sucres of June 1991)**

Survey	Monthly Income	Real Monthly Income	Poverty Level (less than:)
PADCO, Inc (May 88)	31,543	132,481	140,070
Rodriguez (March 89)	46,807	110,465	141,128
Ficha, HFS (June 89) (median)	42,132 (34,000)	92,690 (74,800)	136,620
Ficha, HFS (June 90) (median)	69,089 (70,000)	102,943 (104,300)	92,529
Ficha, HFS (June 91) (median)	120,207 (100,000)	120,207 (100,000)	92,000

Source: Technical Notes on Household Income.

The two shaded columns compare the general population and the health center users to estimated poverty levels. The 1988 and 1989 figures show that average self-reported incomes are lower than the poverty ceiling. For 1990 and 1991, the pattern reverses and income levels are somewhat above the poverty line. This changing pattern can be explained by a severely declining real minimum wage, and the possibility that Solanda households are increasing their incomes even in the face of near hyper-inflation. In any case, the reported income figures are close enough to the poverty line that it is arguable that the majority of Solanda residents and health center users were living at or near poverty at the time of the surveys.

A major question is whether these figures on income are reliable. Self-reported income data are fraught with problems simply because there are numerous incentives for respondents to underreport:

- First and most obviously, respondents may under-report income to interviewers fearing that they may not qualify for a mortgage, or may have to pay a higher fee. In the case of the Solanda surveys, these incentives to under-report were strongly evident.

- Second, respondents may not want neighbors or interviewers to know their incomes.
- Third, they may not know their total household income, since not all household members necessarily report income to the head of household.
- Fourth, informal sector workers may not have an idea about their income, or it may vary substantially from month to month.
- Finally, they may not recognize that in-kind payments, barter exchanges and the like, constitute income.

Unfortunately, there is no way to measure how far under-reported they are with the current information.

6.2 Income Proxies

Another way to gain a sense of income levels is to use proxies such as occupation, education, or housing characteristics. These are often strong indicators of a family's economic situation.

Exhibit 11 shows the results of two HFS surveys which depict the occupations of heads of households in Solanda. The major occupation in both surveys is "services" which includes domestic workers, drivers, food workers, laundry workers, nurse assistants, retail clerks, and others.

In both surveys, the second leading category is "laborer", however, there are nearly twice as many laborers in the health center *Ficha* survey than in the general survey. Similarly, there are many fewer artisans in the health center survey than in the *Barrio* survey. Taken together, the *Ficha* data suggest that the heads of households of families that use the Solanda Health Center are in what are perceived to be lower income occupations. More than 80 percent of the sample were in service, labor, or petty commerce jobs.

Some of these low-income occupations may not be low-paying jobs. Both the services and laborer categories cover some well-paying jobs such as auto mechanic, policeman, or taxi driver. They also include persons who are supervisors in these job categories. A construction foreman would have most likely been listed in the "laborer" category. While the occupational data strongly suggests that the Solanda Health Center users were low-income, it lacks certain details that would reveal what proportion were in fact low income.

Another factor that complicates using occupation as an income proxy is membership in the Ecuadorian Social Security Institute. Members account for only 12 percent of the working population. Benefits include total health care, a pension, long-term disability coverage, sick leave pay, and access to low cost loan funds. Borrowing from the Social Security Institute is the most common way in Ecuador that people buy homes or vehicles. Membership in the Institute clearly raises one's income level and potential in Ecuador. Among Solanda medical clinic users, 51 percent of heads of households were members.

There is a strong correlation between education and income levels. One study in Ecuador showed that workers who had completed secondary school had incomes 62 percent higher than those who had completed only primary school (World Bank 1990). The Solanda data on education only reveals whether a person *reached* an education level, not whether the person completed the level. Nevertheless, the data from Solanda is still revealing. It shows that for both the health center *Ficha* and *Barrio* surveys, about half (48 percent) of the heads of households had either attended or finished secondary school. Another 7-11 percent had undertaken university studies. Roughly 60 percent of the sample had educations which are associated with higher income levels in Ecuador ("Technical Notes on Education"). About 40 percent had only primary education, which is, in turn, associated with lower income groups. Thus, education levels suggest that perhaps four in ten of Solanda families fall in the low-income category.

Exhibit 11

**Occupations of Heads of Households:
Solanda Clinic and Barrio Surveys
(Percentage of Sample)**

Occupation	<i>Ficha</i> , HFS (1989-91)	<i>Barrio</i> , HFS (1991)
Services	49.3	45.5
Laborer	25.4	13.0
Street Vendors	8.3	10.4
Artisan	5.3	13.0
Professional	3.4	5.8
Not Classified	6.3	9.1
Homemaker	1.5	2.6
Inactive	0.5	0.6
Total Percent	100	100
Sample Size	n = 205	n = 155

Sources: *Ficha* Survey, HFS 1991; *Barrio* Survey, HFS 1991; PADCO, Inc. 1989.

Evidence on the quality of housing also suggests that a substantial portion of the Solanda population may be in the middle- or higher- income groups. The PADCO (1989) evaluation of the Solanda housing project noted that 84 percent of the housing units had been improved. The evaluators remarked further that, "The rapidity of the build-out and the quantity of much of the unit expansions and extensions may reveal a larger group of above median-income beneficiaries than indicated in our analysis of income distribution and survey results." The evaluators also stated that the participating lending institutions remain doubtful, "...as to whether the original target group was adequately served by this project" (PADCO, Inc. 1989, p. 44). Data on household characteristics shed light on these conclusions.

Home ownership is very high in the Solanda barrio, which is to be expected given the nature of its founding. Ownership alone is an indicator of higher income because of the cash down payment required for home purchase. Although the government required a down payment of five percent, the average Solanda purchaser paid eight percent. This made the average cash down payment equal to about three

times the monthly minimum wage. A higher portion of the health center *Ficha* sample rented their homes, suggesting that their incomes or circumstances did not permit them to purchase.

The homes are relatively ample, with an average of over two bedrooms and a kitchen. Most of them have the amenities of modern life. Two-thirds of the health center sample owned refrigerators, while over 90 percent of both groups had television sets. Virtually all had radios. A television cost at least 10 times the minimum salary in 1991, and presumably families would only buy one after their food and housing needs had been met. Perhaps most surprising is that any of the families own vehicles.

Nearly one in ten of the health center users stated that they owned a vehicle. Vehicle owners are generally in the very highest income groups in Ecuador.

In sum, although the information on socioeconomic characteristics of the Solanda Health Center users is not conclusive, it seems to place them approximately in the middle range of urban income distribution. Many of them have occupations which are concentrated in the middle- and lower- income groups. Their educational levels are consistent with the average for large urban areas (CEPAR/MSP 1990) which associates them strongly with the average income group. Finally, their household characteristics including home ownership and possessions suggest incomes which are much higher than those reported in the surveys. Based on this information, it is probably safe to assert that the Solanda Health Center beneficiaries are not by any means in the lowest income percentiles. Neither are they in the highest percentiles. The typical person served by the Solanda Health Center is probably the average Quito citizen.

Note on Health Needs at Solanda

The survey data indicates that the Solanda Health Center helped to meet some of the community's basic health care needs during the life of the MAP project. This conclusion arises from data on the initial diagnosis found on the family registration card (*ficha*), and information supplied by respondents about births, deaths and abortions.

Exhibit 12

**Household Characteristics:
Two Surveys in Solanda**

Characteristic	<i>Ficha</i> , HFS, 1988-91	<i>Barrio</i> , HFS, 1991
Owners of Home	63.7%	85.8%
No./Bedrooms	2.2	2.6
Refrigerator	62.2%	78.1%
Radio	92.3%	94.8%
Television	91.9%	98.1%
Vehicle	9.1%	4.5%

Sources: *Ficha* Survey, HFS 1988-91; *Barrio* Survey, HFS 1991.

The four main diagnoses for the first visit were respiratory infections, child health care, diarrhea, and gynecological problems. Together, these four diagnoses accounted for 68.4 percent of total first visits over the period 1988-91. These diagnoses are most often complaints of children and women — usually a society's most vulnerable groups from a health perspective. The average number of pregnancies per woman was 3.5 and 3.7 respectively for the two HFS surveys. These are not completed fertility rates; the total fertility rates are probably much higher. The number of abortions, either induced or spontaneous, appears to be very high, with over half of Solanda Health Center families reporting at least one abortion. The Solanda Health Center provides little in the way of family planning services, which in view of the number of abortions, seems to be a serious deficiency in serving basic health needs.

7.0 ASSESSMENT OF THE SOCIOECONOMIC CHARACTERISTICS OF RURAL CLIENTS AT MARCABELÍ

As noted in the methodology discussion, very little is known about the population of Marcabelí. No records with socioeconomic data are kept. Further, since Marcabelí is a remote site of relatively recent settlement, there has been little academic or development agency interest in the area. Thus, unlike Solanda, no books have been written about Marcabelí, no evaluations have been undertaken, and no surveys of socioeconomic characteristics have been carried out. What little we do know is impressionistic and based on scattered facts and logic.

Marcabelí is a small rural town surrounded by eight small settlements. The town and the settlements together had a population of 4,798 in 1991 (INEC 1991). Local observers estimate that the town has about 2,000 inhabitants. The surrounding settlements are informal groups of houses of varying size and quality. The *Comité* members stated to the authors that many of the people who occupy these settlements live in abject poverty. It takes five hours by foot to walk from the furthest settlement to the town. Walking is the most common form of transport for these settlement dwellers.

The majority of the population of Marcabelí work in agriculture. A small group are artisans, laborers, and employees. There is a local elite consisting of the major business and land owners. One of the most respected local personages estimated that five percent of the population are *gente que tiene* ("those that have"). Another 30 percent have enough income to live reasonably. The lowest 60 percent are "very poor" in this same person's view.

A municipal document prepared in 1990 estimated that the average household income in Marcabelí including the surrounding settlements was 32,000 sucres a month (*Municipalidad de Marcabelí* 1990). The document contains no mention of how this figure was derived, so it must be considered with great caution. This income level is equivalent to about 48,000 sucres of 1991, or 8,000 sucres per month more than the minimum wage. Recalling the previous analysis of Solanda, the Government of Ecuador estimates that an income of 2.8 times the minimum wage is required to sustain a family of six — the estimated size of a Marcabelí household. If these figures are correct, the Marcabelí household is well under the poverty line.

As with Solanda, income levels at Marcabelí are probably under-reported. They are perhaps likely to be even more under-reported at Marcabelí where such a high proportion of the economically active population is involved in agriculture. The agricultural environment offers the potential of local food production, and commodities for trade and barter — all of which would not be counted by respondents as income.

The authors' own observations of the Marcabelí community strongly support the local assessments of income levels. Although the community is growing economically, it still lacks telephonic communications with the rest of the country. There is a noticeable lack of vehicles in Marcabelí. There is visible poverty on the streets, especially in the surrounding settlements. Water supply and electricity are irregular. There are no financial or banking institutions in town or nearby. The town and its environment are decidedly rural. Finally, the municipality in its 1990 assessment stated that the three main causes of

morbidity are parasites, anemia, and skin disorders. These are generally not the main complaints found among high- or middle- income groups, or even lower income groups in urban areas.

Taken together, the above impressions, observations, and facts suggest that the majority of the population served by the Marcabelí Health Center fall under the poverty line, and are among the lowest income percentiles in the country. Given that 78 percent of all rural families in Ecuador are estimated to be living in poverty, this is a logical conclusion (World Bank 1990).

Note on Health Needs at Marcabelí

As at Solanda, the Marcabelí Health Center helped meet the community's basic health needs according to scattered information on the types of clients served in the laboratory. This conclusion is reached by examining the gender of clients served for the sample period, September–November 1991. Two-thirds (64 percent) of all clients were females. Furthermore, the laboratory operated a special discount program for school children which brought in large numbers for testing. The monthly records for 1989–91 show that during the peak volume months of April and May, up to 75 percent of clients were school children being tested for parasites and blood type. Therefore, a large portion (probably half) of the remaining 36 percent of clients were male children. Thus, more than 80 percent of laboratory clients at Marcabelí were individuals in the target group of women and children.

8.0 CONCLUSIONS AND RECOMMENDATIONS

The MAP-USAID approach in this project was to test an alternative health financing mechanism by establishing and paying for two health centers. The objective was to obtain financial self-sufficiency through serving low-income groups. MAP developed and paid for the infrastructure, hired staff, covered recurrent costs, and provided technical assistance. The PVO also handled relations with the community and tried to foster a desire in the community to assume responsibility for the health centers. Once established, MAP attempted to shift the costs of operation over to the health centers and the communities, with varying degrees of success.

By the end of the project in 1991, the largest of the two health centers, Solanda, was recovering about 30 percent of its total costs. The Marcabelí Health Center, a more modest effort, was recouping 90 percent of its costs. The financial viability of both health centers was in question by the end of the project.

8.1 The Solanda Health Center

The performance of the Solanda Health Center suffered because prices were set too low to be financially sustainable, the medical clinic and laboratory were underutilized, staff was inefficiently allocated, and nearby competition reduced demand. The project design probably contributed to these outcomes. Achieving the objectives of financial self-sufficiency required that the health centers be operated using basic business operating principles, such as realistic pricing, accurate accounting of profits and losses, analyzing financial impacts of decisions, among others. The activity was not carried out like a business, but in fact operated as a heavily subsidized PVO service provider with token fees. For example, no business strategy or plan is found in any of the project documents. Little economic and financial analysis was carried out to assess performance and make business-like decisions. The staff assigned to operate the health center did not have backgrounds or experience in the business of health services.

Community influences further pressured the health center managers to make decisions, such as, not to raise prices, that severely limited improved financial performance. Unanticipated local competition appears to have held down demand even though prices were extremely low at Solanda. All of these factors are related to the structure called for in the project design, and the outcome of minimal cost recovery at Solanda is consistent with that design.

Finally, one of the main objectives of the project was to serve low-income groups. At Solanda, this was achieved by offering a large subsidy to all clients regardless of income level. This blanket subsidy adversely affected financial performance and limited the opportunity to target those in most need with assistance. All persons at Solanda paid the same heavily subsidized prices.

8.2 The Marcabelí Health Center

The Marcabelí Health Center was operated more like a business. Therefore, its performance in achieving financial self-sufficiency was markedly better than Solanda's. Part of Marcabelí's success derived from the fact that it did not operate a highly subsidized medical clinic. For most of the project, Marcabelí operated only a laboratory and a small pharmacy.

MAP kept subsidies low compared to Solanda. Thus, the employees and community managers had a strong incentive to be efficient by keeping costs under control, and expanding income potential. Laboratory exams were marketed to the community and even to nearby towns. Discounts were offered to schools for blocks of exams. The pharmacy began to stock over-the-counter drugs and personal care products in an effort to increase sales volume. The community, through the Marcabelí *Comité de Salud*, raised funds to expand the inventory in the pharmacy. It also enlisted the assistance of the municipal government for the purchase of additional laboratory equipment, and small operating subsidies for the laboratory.

Because of the way the Marcabelí Health Center project was designed, the community had control over decisions and felt as if it had a stake in the center's operation and success. It generally made the right business decisions. For example, when the health committee decided to recruit a physician to offer consultations in the health center, it chose the lowest cost and lowest risk arrangement possible. Because of Marcabelí's incentives, and its community base, therefore, the health center there achieved near self-sufficiency in the final year of the project.

8.3 Recommendations

It is not the purpose of this study to suggest what should or could have been done to improve performance. However, lessons can be derived from the MAP experience that will help in the design of future projects which have the objective of stimulating private, un-subsidized health services for low income groups. In addition, these recommendations may be helpful to the communities which now have responsibility for managing the Solanda and Marcabelí Health Centers.

8.3.1 Understand the Market

It is important to know basic information about the contemplated market for health services before investing in an infrastructure and committing to recurrent costs. This includes data on the size of the population to be served, health needs, income levels, and sub-groups within that population to be targeted. In addition, it is essential to collect information on where people are now obtaining health services, what they are paying for health services, and what services are available. This information greatly improves project design by making it possible to determine what groups should be targeted for what kinds of services, what are accepted prices, and who can and cannot pay these prices before service packages and prices are fixed.

Surveys on demand and supply of health services in Ecuador are very inexpensive to carry out, and should be required before large amounts of funds are invested in health care provision. Such a survey in Solanda may have resulted in a different pricing structure, or a different service mix. It could also have alerted the project managers to possible problems in competition. For example, there are several other laboratories in Solanda and neighboring barrios which charge similar prices for exams. A full understanding of these competing facilities may have resulted in a design decision to have all laboratory tests carried out at a nearby facility through a referral arrangement. In this hypothetical case, the Solanda Health Center would have improved its efficiency by eliminating a money-losing part of the operation with no diminution of services to the clients.

8.3.2 Price the Services Correctly

Complete cost recovery will not be successful if the services are priced below the costs of providing the services, unless of course there are highly profitable services in other cost centers that can subsidize unprofitable ones. In the case of Solanda, the fixed charge for a consultation in the medical clinic was set so low that significant cost recovery was impossible. If prices had been raised at Solanda to cover all costs, the price of a medical consultation would have approximated prices in the lower end of the local private market. Given that the medical clinic was underused in any case, charging market prices may have severely reduced demand and jeopardized the entire operation.

The Solanda Health Center will survive in 1992 because of the large Ministry of Public Health subsidy (in the form of a physician and a nurse) obtained in 1991, and because rent payments will not be required from the Fundación Mariana de Jesus. As noted, when these subsidies are not counted as real costs, the level of cost recovery rises dramatically. Had the Solanda Health Center charged 1,000 sucres per medical consultation in 1991 (equal to nearby PVO charges), and had the rent been forgiven as it is in 1992, *operating* cost recovery would have risen from 56 to 87 percent assuming no decline in demand. At 87 percent cost recovery, improvements in the efficiency of the cost centers coupled with a rise in productivity could make the health center financially self-sustaining for its day-to-day operations. This rise in prices would not solve longer-term problems of eventually having to recover more than operating costs in order to save or borrow for future capital expenditures.

8.3.3 Target Subsidies Through Price Discrimination

The price structure at Solanda served all clients regardless of income. Surveys show there is a wide income distribution in Solanda. Raising the prices of medical consultations at Solanda to achieve greater cost recovery would have undoubtedly reduced demand by the lowest income families. The potential adverse impact of higher charges for services could be alleviated by charging the lowest income families a lower fee. This would require some form of means testing which is sometimes difficult to administer effectively. However, given that the Solanda Health Center is not financially viable with its 1990/91 structure and organization, means testing and a segmented price schedule would have been possibly the only way to achieve project objectives.

8.3.4 Use Common Business Management Practices

If cost recovery and the provision of health services to low income families is the main objective of a project, it is imperative to introduce solid business practices into the operation. One of the main problems in all of Solanda's cost centers, and in the Marcabelí laboratory is the internal efficiency of operations. The high costs of service provision alone would signal managers that there may be inefficiencies in the system. However, the unit costs of services, for example, were not tracked or even calculated at either site. It also appears that there was little analysis of labor allocations in relation to health center outputs such as, client visits or exams performed. Without basic financial and business analysis, decision makers had little information with which to make decisions, or make presentations to community leaders. Under these circumstances, decisions are based on intuition and best estimates instead of easily available hard information. In this kind of project experiment, it is essential to set up financial analysis systems in order to gain the greatest efficiency in performance.

Included in the definition of common business practices is having a business strategy. Financial analysis would have shown that certain cost centers were not fully used. To improve efficiency associated with not operating at full capacity, a business can lower the costs, for example, cut back on hours or increase sales. The Marcabelí Health Committee recognized this to some degree and endeavored to widen their markets for both the laboratory and the pharmacy. This business strategy was one of the reasons for Marcabelí's success. Solanda could have benefitted from a program to expand demand for services in some of the same ways that Marcabelí did.

Finally, technical assistance must include skills such as business management, accounting, and financial analysis so that employees and managers left behind after the project ends have the tools to assess performance and make sound decisions.

8.3.5 Decentralize Decision Making

One of the major differences between Solanda and Marcabelí is how financial decisions were made. In Solanda, these decisions were basically made by an outside group, while in Marcabelí they were made in close collaboration with employees and community leaders. The Marcabelí model seems to have been much more effective in engendering community support, developing local capacity, and fostering sound financial decisions. One main result of this approach is reflected in the higher levels of cost recovery for the laboratory and pharmacy at Marcabelí than at Solanda.

8.3.6 Simplify Relations with Community

Complex and sometimes contentious relations with the community hindered the achievement of sustainability at Solanda. Large amounts of financial and human resources were invested in community activities and relations to make sure that all parties supported the health center and agreed on how it would be operated. Because so many parties were involved, some key decisions became political rather than financial issues, such as the price of services. As a result, cost recovery

performance suffered. Although community support is helpful, it can consume huge amounts of front-end resources, and can stymie good decision making. Again, Marcabelí contrasts to Solanda in this regard.

8.3.7 Test Different Health Financing Alternatives Simultaneously

The MAP-USAID project tested one variation of numerous possible configurations for the provision of self-sufficient health services to low income families. The project took six-and-a-half years, and resulted in a series of lessons learned. The Solanda Health Center probably does not provide a replicable model, while the Marcabelí case possibly could be transferred elsewhere. Even though only a fraction of project resources went to the two health centers, the project incurred enormous relative costs on home office staff, start-up expenditures, site selection, and community relations. For this reason alone, the project is not replicable.

The objective of the project, however, is even more worthy of pursuit than it was in 1984 when MAP submitted its original proposal. Given the reality of shrinking public sector resources and declining service quality in the Ministry of Public Health and Social Security Institute, millions of Ecuadorians of all income groups will seek health services in the private sector. The majority of Ecuadorians probably already obtain their out-patient care from private sources. Expanding options for high quality services for low income families in the private sector can make an invaluable contribution to the country's development, while at the same time take pressure off already overburdened public sector providers.

The most efficient way to expand options for private health care would be to test alternate financing and service provision approaches *simultaneously, and more rigorously, and in a shorter period of time*. The MAP-USAID experience suggests some additional approaches for testing that could build on the lessons learned from this project.

8.4 Additional Approaches for Testing

- **Contract Arrangements with Private Providers.** In the Solanda and Marcabelí experiments, MAP shouldered virtually all the costs of start-up and initial operations. In Solanda, MAP also paid for the bulk of recurring costs during operations. In a heavily subsidized operation such as Solanda, there was limited incentive by employees or the community to achieve maximum efficiency. An alternative approach would be to establish a joint venture with private groups to provide quality services at reasonable prices. Initial investments could be fronted by the donor, but the operating risks would be shared with private providers who would offer discounts. In a sense, this approach was taken by the Marcabelí *Comité* when it offered its space and clients to a private physician who agreed to provide consultations at affordable rates. This approach introduced incentives for efficiency and cost containment, and it cost the Marcabelí Health Center almost nothing.

- **Invest Only in Start-Up Costs**

In several Latin American countries, the "Doc-in-the-Box" approach has been very effective. In this approach, physicians are provided with the initial investment to open practices among low-income populations. They assume total responsibility thereafter, and must adhere to certain service practices, for example, lower prices for the poor. This experiment is being tested in Ecuador and should be thoroughly studied.

- **Gain Community Support Through Good Services**

The community may be as convinced of the value of high quality, inexpensive health services through experiencing such services, rather than through networking and community education. This approach hypothesizes that it is worth testing fee-for-service health care without investing large resources into community relations.

- **Provide Technical Assistance to Existing Private Services**

The private sector already provides health services to large proportions of people in Ecuador, especially for outpatient care. It may be more cost-effective and efficient to work directly to improve or expand existing private health care systems to meet the needs of low-income groups. There is enormous potential for private expansion in Ecuador as indicated in previous reports prepared by the HFS Project.

- **Subsidize Poor Families Directly to Use Existing or Emerging Private Services**

The financial analysis from Solanda show costs for services which are at least equal to equivalent private prices. In essence, the MAP-USAID project created a provider which delivered services at the same cost as existing private providers. Some of these services reached low income families and some reached families with higher incomes. The addition of large start-up costs and technical assistance costs would have raised the real costs far above existing private costs.

A possible alternative would be to directly subsidize the lowest income families through vouchers good in private clinics which would reduce the price of private services to affordable levels. Solanda's medical clinic deficit is estimated at 8.3 million current sucres in 1991. This amount was subsidized by MAP and the Ministry of Public Health. Assuming that 25 percent of Solanda's clients are in the lowest income target group, the cost of subsidizing these families would be approximately 1.25 million sucres per year plus administrative costs estimated at no more than 1.0 million sucres. Under this approach, the annual costs to those subsidizing the operation would fall by 75 percent. The amount of subsidy would be less than currently provided by the Ministry of Public Health. This approach could also stimulate private providers and possibly lower private prices.

MAP Evaluation
TECHNICAL NOTES

1.0 Accounting System at MAP

MAP has used three different accounting systems during the life of the project. The first system was used from project inception in 1985 until 1988. Another system was used for 1988 through 1990, while the current system is being employed for 1991 — the final year of the project. All three systems contain a general ledger, monthly income and expenditure statements, and monthly balance sheets. The three systems differ mainly in the amount of detail that they provide, the categories of expenditures from year to year, and by source of funds and accounting location.

During the first years of the project, the majority of funds consisted of direct dollar transfers from A.I.D. By 1988, the dollar funds had been largely expended and the main source of funds became the local currency account administered by the Ministry of Finance. Therefore, for the period 1988 through 1990, MAP divided the accounting system by funding source. Regarding the level of detail, the later years are much more comprehensive in the number of sub-account categories, and also provide more information through more detailed line item labeling. Therefore, the improvement in the project accounting system by 1991 makes the allocation of expenditures by cost center feasible for the final two years of the project.

None of the MAP systems separate accounts by cost center. In order to obtain expenditures by cost center, it was necessary to disaggregate sub-accounts in the general ledger and assign them to cost centers. This involved reviewing and allocating hundreds of general ledger entries. For many of these entries, the recipient cost center was not obvious, making it necessary to review numerous entries with MAP staff who had firsthand knowledge of expenditures. An example of this problem would be an entry under the sub-account entitled "Human Resources" with the notation of "Sistema Salud Solanda/Reimb." This entry would have to be checked against the accounts of the Solanda Health Center to determine if cost center allocation was possible through their records, and if not, MAP staff in Quito with direct knowledge would be consulted. If comparing against other accounts or checking with MAP staff produced the information that the expenditure was for, say, equipment, then the inventory list would be checked, and the expenditure allocated to its proper cost center.

Similarly, various general ledger entries are simply aggregates of several expenditures. For contract labor, it was necessary to review all vouchers submitted by the temporary agencies and reconstruct labor charges. Finally, for the years before 1991 some categories of charges, such as direct hire labor and contract labor, are spread among several sub-accounts in the MAP accounting system. For example, in the 1990 accounts, direct hire labor charges appear in three sub-accounts — salary, benefits, and human resources (where health insurance charges are found).

2.0 Dollar and Sucre Accounts and Exchange Rates

For the purposes of A.I.D. requirements, MAP keeps most of its accounts in dollars even though nearly all the funds received in the past two years are Ecuadorian sucres. Because this study is aimed at Ecuadorians, all tables and analysis are carried out in sucres. This required using MAP voucher records to convert all MAP figures from dollars to sucres at the same monthly rate that they were originally converted to dollars. MAP uses an A.I.D. exchange rate that is slightly lower than the open market rate.

The conversion rates used for 1990 and 1991 are:

Note Exhibit 1

Ecuadorian Exchange Rates (Sucres = \$1.00)		
	1990	1991
January	581	858
February	662	858
March	692	902
April	692	977
May	692	977
June	778	977
July	791	977
August	791	1108
September	846	1108
October	858	1108
November	858	1108
December	858	1108

Source: MAP International. 1991. December exchange rate is provisional.

3.0 Assignment of Unallocated Costs at MAP

Certain cost categories maintained by the MAP central office are unallocated by cost center or by health center, and could not be traced as in the above cases. Therefore, it was necessary to estimate the proportions of each cost category that are allocated to 1. the health center, and 2. the cost center within the health center.

MAP support to the project took the form of direct payments to staff working in the Health Centers, the provision of equipment, training, supplies, vehicles, and cash subsidies. MAP also had its own staff stationed near the health centers and in the home office in Quito. These staff spent varying amounts of time working on the activities of the different cost centers. These individuals included on-site coordinators, field facilitators and communicators. In the home office, staff included the Project Director, the Accountant, and overhead support such as secretarial services.

MAP staff in the field supporting the health centers also had their own equipment and supplies, and maintained offices to administer all or part of project activities. MAP staff in the home office in Quito also had their own equipment, supplies, offices, and administrative apparatus. In addition, MAP staff in Quito travelled frequently to the health center sites to oversee activities, provide technical assistance, and carry out community activities.

To obtain accurate figures on all projects costs, it was essential to disaggregate the considerable unallocated MAP costs according to cost centers in a manner similar to that carried out with the Solanda and Marcabelí accounts. This exercise was required not only for MAP field costs but for home office costs as well. The researchers disaggregated the principal unallocated costs categories according to the following formulas. Again, the formulas are based upon direct measurement, direct observation by the research team, or upon the advice of MAP staff with intimate knowledge of the project activities and personnel.

3.1. Direct Hire Labor

MAP field staff allocated the great majority of their labor to community education activities. Lesser portions were allocated to the establishment and operation of the laboratories, pharmacies and clinics. Direct hire MAP staff rarely, if ever, worked "on the line" in laboratory, pharmacy or medical clinic operations. Rather, they assisted as needed in planning, training, administration, and liaison with the community. MAP did not maintain, nor would they be expected to maintain, detailed records of how their staff divided their labor among the four cost centers that made up the project. Therefore, the authors developed proportional allocations of field staff time in consultation with project management and staff. MAP staff and managers estimate that 10% of their overall project effort was spent on health service provision activities, that is, laboratory, pharmacy or medical clinic at the two sites. Community education activities accounted for the other 90%. This includes staff in the field and staff in the Quito home office. A review of the various accounts, expenditure categories, job descriptions, and direct observation support this estimate.

The split in level of effort between Solanda and Marcabelí is estimated at seven percent for Solanda and three percent for Marcabelí. This is because Solanda simply received more human and financial support than Marcabelí. Again, a review of project documentation supports this split. Among the cost centers at each health center, MAP direct hire level of effort was divided equally. Therefore, for MAP direct hire staff, their allocations are as follows for each health center: Solanda, laboratory (2.33%), pharmacy (2.33%), medical clinic (2.33%); Marcabelí, laboratory (1.5%), pharmacy (1.5%).

3.2. Contract Labor

Besides direct hire field staff, MAP also contracted for the services of staff to serve directly in health center operations. These were line workers who included administrators, physicians, nurses, laboratory technicians and pharmacy sales persons. MAP contracted these individuals through temporary employment agencies in various configurations and for varying time periods over the life of the project. In addition, this cost category also included short-term consultants, and other small miscellaneous expenditures related to field activities. These costs appear in the general ledgers as a single entry for contract labor. To disaggregate these labor costs, the authors examined all monthly bills submitted by the temporary employment agency for 1990 and 1991. This exercise provided the name of the worker and the amount of labor charge. The authors then determined the cost center(s) in which the worker was employed, and assigned the expenditure to the labor category in that cost center. Short-term consultants and miscellaneous expenditures not specifically identified were assigned proportionally as in "Direct Hire Labor" above.

3.3. Travel and Transportation

MAP direct hire staff were the principal beneficiaries of travel and transportation expenditures. It was not possible from the accounts to determine which health centers and which cost centers were recipients of the expenditures. For example, in 1990 there are 113 entries under the travel and transportation category many of which simply note "travel reimbursement," or "travel advance."

These costs have been allocated according to estimates derived from MAP staff and management as above. Again, the majority of these costs are allocated to community education activities since this was the main task of most direct hire MAP staff. Accordingly, these costs are allocated in the following manner for each health center: Solanda, laboratory (2.33 percent), pharmacy (2.33 percent), medical clinic (2.33 percent); Marcabelí, laboratory (1.5 percent), pharmacy (1.5 percent).

- **Vehicles:** The project purchased three vehicles. One is used and maintained by Quito home office staff, while the other two are used by field staff in Marcabelí and Solanda. The primary use of these vehicles is for MAP staff which means that they are principally used for community education activities. However, the two field vehicles perform valuable transport services for the various cost centers. Not only do they move staff around, for example, take the Marcabelí accountant to the bank in Machala 90 minutes away, but they are used to pick up or move equipment and collect certain supplies. It is estimated that 10% of the total cost of MAP vehicles is used equally by each cost center in the two locations.

This amount would undoubtedly cover the costs of public transportation should the MAP vehicles become unavailable to the health centers. For 1991, vehicle costs are amortized equally across the year.

3.4. Supplies and Office Expenses

Where it was possible to identify the location and cost center of an expenditure, the cost was allocated to the proper cost center. For example, within this category in the 1990 general ledger is a subsidy to the Solanda Health Center which is noted in the analysis as a subsidy expense for MAP and donated income for Solanda. For the remainder of the expenses, the authors derived estimates through an analysis of the expenditures and consultation with MAP staff, and used the percentages as in "direct hire labor" above.

3.5. Indirect Costs

Since 1988, MAP's indirect rates have varied between 10 percent and 13 percent. These are apportioned according to the same formula as direct hire MAP labor: Solanda, laboratory (2.33%), pharmacy (2.33%), medical clinic (2.33%); Marcabelí, laboratory (1.5%), pharmacy (1.5%).

3.6. Capital Expenditures

Many of these are identified in the MAP accounting systems, and others are identified in the health center inventories. Those which have not been identified have been apportioned according to the same formula as "direct hire labor" above. Unidentified allocations of capital expenditure have been depreciated on a straight line basis. Depreciation is further discussed in another technical note. (See 6.0 Depreciation).

3.7. Rent

MAP directly pays rent to the *Fundación Mariana de Jesus* for the use of the building housing the Solanda Health Center. These expenses are paid to the Fundación in two or three payments each year. For example, the rent payments for 1991 were all made between October and December. The rent for 1990 was 1,536,000 sucres while the rent for 1991 dropped to 1,000,000. The current annual costs were divided by 12 and the amounts entered as monthly rent.

3.8. Other Miscellaneous Costs

These include such items as audits, legal consultations, and contingencies. They have been apportioned as in "direct hire labor" above.

3.9. Miscellaneous Subsidies

MAP provided direct subsidies to the two health centers to support service provision. These are periodic transfers which are used to meet needs in the laboratory, pharmacy and medical clinics. No records were kept on the exact nature of the request or how the funds were expended in the health centers. MAP

staff estimates that in the past two years, the subsidies were spent in the following manner: Solanda, laboratory (50 percent), pharmacy (25 percent), and medical clinic (25 percent); Marcabelí, laboratory (75 percent), pharmacy (25 percent).

4.0 Allocation of Costs at Solanda

Accounts at the Solanda Health Center are only partially kept according to cost center. For example, it is possible to discern the salary expenses for the laboratory, pharmacy, or the medical clinic. However, there are a number of costs which are not accounted for by cost center. These costs are allocated in calculations according to the formulas below. They are based upon either direct measurement, direct observation by the research team, or on advice of MAP or health center staff. Several of these are sub-categories which are in turn incorporated into larger expenditure categories. For example, installations are included in the analysis under the category of "Other Direct Costs." Final categories are noted in brackets.

4.1. Office supplies

Divided equally among the three cost centers: laboratory (33.3 percent), pharmacy (33.3 percent), and medical clinic (33.3 percent). [Supplies]

4.2. Installations

The laboratory in both health centers has accounted for the large majority of equipment installations. The agreed upon allocation is laboratory (70 percent), pharmacy (15 percent), and medical clinic (15 percent). [Other Direct Costs]

4.3. Transport

These are direct charges by the health centers for transportation of goods or personnel by public means. Divided equally among each cost center. [Transport]

4.4. Cleaning Services

Allocated proportionally according to square meters of building space: laboratory (56.2 percent), pharmacy (20.4 percent), and medical clinic (23.4 percent). [Other Direct Costs]

4.5. Telephone, refreshments, administrative training, short-term labor (for example, painting)

Divided equally among the three cost centers. [Other Direct Costs]

4.6. Administrator

The administrator at the Solanda Health Center has multiple responsibilities which include general accounting for the center, accounting for the three cost centers, registrar for patients, and part-time pharmacist sales person. The administrator provided estimates of how she spends a typical eight-hour day. The results are: pharmacy (three hours), laboratory (one hour), medical clinic (one

hour), and general accounting and administrative (three hours). The authors allocated the three general accounting hours equally across the three cost centers. The administrator's costs are distributed as follows: pharmacy (50 percent), laboratory (25 percent), and medical clinic (25 percent).

Other important costs at Solanda have been paid by the Ministry of Public Health. Beginning in 1990, the Ministry provided a physician and a nurse to the medical clinic at the Solanda health center. The Ministry will continue to provide these critical personnel at no direct cost to the health center. The analysis notes this economic cost to clinic operations.

5.0 Allocation of Costs at Marcabelí

Accounts at the Marcabelí Health Center are kept by the Treasurer of the Marcabelí *Comité de Salud*. The account books from 1989 (the first year of laboratory operations) could not be located in the town. The present Treasurer has possession of the 1990 and 1991 books. These are general ledgers similar to those of Solanda. For 1990, laboratory and pharmacy income and expenditures were kept in the same ledger. For 1991, the Treasurer is keeping separate accounts for each of the two cost centers. The recording of income and expenditures for both years is clear and there were no problems in assigning direct costs and income to each cost center.

In August 1991, the Marcabelí Comité initiated a weekend medical clinic using a small space in the health center. This clinic is staffed by a visiting physician. The physician keeps all the books on his operation in his home city of Machala—some two hours away. During this research, it was impossible to contact the physician or to obtain his records. Further, the health committee had no information on the practice as the physician had not responded to its requests for financial and patient information. Therefore, this study is missing cost information on the Marcabelí medical clinic for part of August and all of September 1991 (a maximum of 12 days of operation). Since the medical clinic operated in laboratory and pharmacy space, the physician uses his own equipment, and since apparently few patients were seen, the absence of this information does not affect the evaluation of the laboratory and pharmacy.

The Marcabelí Health Center is a remarkably simple operation compared to Solanda. There are virtually no unallocated costs. Those that would normally be unallocated, such as, telephone, cleaning services, administrator, do not exist at Marcabelí. Those few unallocated costs such as office supplies were assigned equally to the laboratory and the pharmacy, for the quarters in which they both operated.

6.0 Depreciation

6.1 Method of Calculation

The authors consulted with an accounting firm, a major private hospital, and with others to determine the standard periods of depreciation for capital goods used at Solanda and Marcabelí. The following periods are standard, accepted practice

in Ecuador as of December 1991: Vehicles--five years; Office equipment--five years; Medical equipment--five years; Furniture, cabinets, bookshelves--10 years; Major appliances--10 years.

MAP and health center inventories show, with few exceptions, the date of purchase and the *dollar value* of the item. The authors depreciated all items using the straight line method. In a few cases, the data of purchase for Solanda capital expenditures was unknown. Since most capital expenditures occurred in 1987 and 1988, the year of purchase was assumed to be 1988 for unidentified items. This was the year that the center opened.

After calculating depreciation costs for 1990 and 1991, dollars were converted into current sucres and inflated according to the exchange rates used by A.I.D. and MAP. An average annual rate of exchange was used ($S/758 = \$1.00$ for 1990, and $S/931 = \$1.00$ for 1991). Total annual adjusted depreciation was then divided into the four quarters of each year.

7.0 Pharmacy Inventories

The lack of information available on inventories makes it difficult to calculate accurately the income or expenditures accruing to the pharmacy cost centers due to inventory build-ups or drawdowns, or price changes. To achieve a true picture of operating gains or losses, it is necessary to adjust the income accounts for additions and subtractions to inventory and profits and/or losses on sales.

Unfortunately, the records kept at Solanda and Marcabelí do not permit an accurate accounting of the effects of inventory changes on operating income (that is, the accrual method of inventory accounting). Inventories are taken only once a year on average. The original value of the inventory is carried on the books from one month to another until there is another inventory. In the absence of supplementary accounts, it was not possible to decipher the net gains and losses from inventory turn over from the balance accounts.

The general ledger for Solanda, however, does list all purchases and sales of pharmacy goods from the pharmacy's inception in 1989 until October 1991. From this ledger, it was possible to reconstruct the inflows, outflows, and period-end inventories for Solanda. These figures, in turn, enabled the calculation of net additions or subtractions to operating income due to sales or purchases which would change the total inventory stock. These are called "inventory adjustments" in the Solanda pharmacy accounts in this evaluation, and are expressed in current sucres. These adjustments for Solanda have the effect of holding the inventory constant during the two year period of analysis. While not the most desirable method for taking inventory gains (losses) into account, this method is preferable to a cash accounting approach which distorts operating costs.

The records on the Marcabelí pharmacy inventory are more complicated. The account balances, unlike Solanda, show profits and losses on pharmacy inventory using accrual accounting (that is, sales less cost of sales). The general ledgers also show total purchases and sales. The general ledger for November 1990 shows an expenditure entry for some 975,000 sucres which represented in fact a loan from the Ministry of Public Health in the form of pharmaceuticals. Some of these pharmaceuticals were sold with the remainder being carried on the books

as inventory until they were to be returned to the Ministry of Public Health in late 1991. These "loaned" pharmaceuticals severely distort the calculation of inventory adjustment from the general ledger.

For Marcabelí, therefore, the balance sheet indications of profit and loss for the first two quarters of 1991 are used in the pharmacy income tables though it is not clear how they were derived. However, they seem reasonable in view of the fact that the pharmacy aims to achieve a 15 percent profit on its sales, and the amount of profits shown for the 6-month period January-June 1991 are about 15 percent of the value of sales. Profits on sales for the third quarter of 1991 and the last two quarters of 1990 were extrapolated from the first two quarters of 1991 sales and profits, that is, derived using the same percentage of profit on sales.

8.0 MAP-USAID Project Expenditures

The MAP-USAID/Quito agreement originally called for a budget of \$645,000. It was amended in 1990, the original final year of the project, with the addition of another \$100,000 making the project total \$745,000. The following is the authors' accounting of total project expenditures based upon MAP general ledger accounts. It is presented with the understanding that it could be incomplete due to the difficulty of deciphering the early year accounts.

Note Exhibit 2

Annual and Cumulative Expenditures: MAP-USAID/Quito Project (Current U.S. Dollars)

Year	Annual Expenditure	Cumulative
1985	29,710	29,710
1986	93,519	123,229
1987	149,703	272,932
1988	133,791	406,723
1989	137,771	544,494
1990	73,931	618,425
1991*	47,886	666,311
Total	\$666,311	\$666,311

* First 10 months only

USAID's reports show the total expenditure for the project through September 1991 as \$633,745 (USAID 1991). With probable accruals, the figures in the exhibit above and USAID's are very close if not identical.

9.0 Household Income Estimates

Self-reported income estimates are nearly always considered with reservations, and the following Solanda estimates are no exception. Respondents tend to under-report because:

- It is not to their advantage to give the full amount (for example, they are trying to be charged a lower fee, or they do not want their neighbors to know their income); or
- They do not know how much the household earns each month.

On the latter point, many household members may earn money sporadically by doing odd jobs, or alternatively they might earn cash as a street vendor and not even report the income to the head of household.

Income information in the three surveys below are obtained by asking the head of household how much money the household takes in each month. The *Ficha* (Registration Card) Survey data was taken by the clerk of the Solanda clinic at the time of the first visit of any family member. The Rodriguez survey was data was obtained from a several-hour interview taken in the respondent's home by a neighborhood interviewer. PADCO obtained its information through professional door-to-door interviewers.

Despite the drawbacks of income data obtained in this manner, data from the three surveys below appears to be remarkably consistent. It is especially consistent when one considers real wages where the differences from the average is about 20 percent. This suggests that respondents may be under-reporting at approximately the same rates in each survey. It also means that the survey results are probably comparable.

Note Exhibit 3

Average Self-Reported Monthly Income: Three Surveys, 1988-91 The Solanda Barrio (Current and Real Suces)					
Month/Year	Ficha Survey	Rodriguez	PADCO Inc	Real Income (June 1991 Suces)	Real Minimum Wage*
May 1988			31,543	132,481	60,900
March 1989		46,807		110,465	61,360
June 1989 (median)	42,132 (34,000)			92,690 (74,800)	59,400
June 1990 (median)	69,089 (70,000)			102,943 (104,300)	40,230
June 1991 (median)	120,207 (100,000)			120,207 (100,000)	40,000

Sources: *Ficha* (Registration) Survey, HFS 1991; Rodriguez 1990; PADCO, Inc. 1989; World Bank 1990; Inflation figures from Banco Central del Ecuador, 1987-91.

Notes: Inflation index based on monthly index where June 1991 = 100. Multipliers are June 1990 (1.49), June 1989 (2.20), March 1989 (2.38), and May 1988 (4.20), authors' calculations. The Solanda *Ficha* survey sample was drawn evenly over the course of each year. The June inflation figures are used as an average for the entire year in these three cases.

10.0 Occupational Characteristics

The three surveys below sample approximately the same population. Two qualifications are worth noting. First, PADCO reports a lesser portion of occupations in "services" and a much higher proportion in "professional" than the HFS surveys. The discrepancy occurs because of PADCO's definition of these two categories. For example, PADCO includes drivers, nurse aides, and clerks in the "professional" category, while in the HFS *Ficha* and *Barrio* surveys, these are considered "services". A reconciling of these discrepancies would probably yield PADCO figures very similar to those of HFS.

A second qualification is that the *Barrio* survey is based on a 100 percent sample of the households in Sector 1. This sector was the first settled in Solanda and could represent families who are more established. This would explain why the *Barrio* survey shows fewer heads of households in the "laborer" category and more in the "artisan" category.

Note Exhibit 4

**Occupational Characteristics: Solanda Barrio Surveys and
Clinic Survey, 1988-91
(Percentage of Survey Sample)**

Occupation	<i>Ficha</i> Survey, HFS (1989-91)	<i>Barrio</i> Survey, HFS (1991)	PADCO (1988)
Service	49.3	45.5	28.9
Laborer	25.4	13.0	18.2
Street Vendor	8.3	10.4	9.5
Artisan	5.3	13.0	12.4
Professional	3.4	5.8	19.9
Not Classified	6.3	9.1	7.3
Homemaker	1.5	2.6	—
Inactive	0.5	0.6	3.8
Total Percent	100	100	100
Sample Size	n = 205	n = 155	n = 346

Sources: *Ficha* Survey, HFS 1991; *Barrio* Survey, HFS 1991; PADCO 1989.

Note Exhibit 5

**Education Levels Reached or Completed by Heads of Households,
Three Surveys of Solanda, 1988-91
(Percentage of Total)**

Level	Rodriguez (1989)*	<i>Ficha</i> Survey, HFS (1988-91)	<i>Barrio</i> Survey, HFS (1991)
None/No Response	—	5.9	5.2
Primary	50.5	38.5	35.5
Secondary	43.8	48.3	48.3
University	5.9	7.3	11.0
Total	100.0%	100.0%	100.0%

* Adjusted from authors' figures to add to 100 percent; All with no education placed in "primary" category.

Sources: Rodriguez 1990; HFS 1991.

Note Exhibit 6

Diagnosis for Initial Visit to Solanda Medical Clinic, 1988-1991 (Percent of Total)	
Respiratory Infection	33.7
Child Health Care	17.1
Diarrhea	8.8
Gynecological	8.8
Prenatal Care	3.9
Skin Disorder	3.4
Emergency	0.4
Other	23.9
Total	100.0

Source: *Ficha* Survey, HFS 1991.

Note Exhibit 7

Select Health and Demographic Characteristics,
Two Surveys in Solanda, 1988-1991

Characteristic	<i>Ficha</i> Survey, HFS, 1988-91	<i>Barrio</i> Survey, HFS, 1991
Average No. Pregnancies/Woman	3.54	3.67
Average No. Children	2.59	2.42
Women Who Had Infant Die	7.3%	9.7%
Women Having at Least One Abortion*	51.6%	28.3%

* Abortions probably include induced and spontaneous varieties.

Sources: HFS 1991.

MAP Evaluation

ANNEX EXHIBITS

ANNEX EXHIBIT 1A.

TOTAL LEVEL OF COST RECOVERY: Solanda Health Center, 1990 (Current Sucres)

	Quarter				
	Q1	Q2	Q3	Q4	YEAR
Operating Income	1,037,450	987,925	898,194	636,100	3,559,669
Operating Costs	2,845,390	1,818,515	1,871,821	1,746,758	8,282,494
Oper Gain (Loss)	(1,807,940)	(830,590)	(973,627)	(1,110,658)	(4,722,825)
Percent Operating Costs Recovered	36.5%	54.3%	48.0%	36.4%	43.0%
Capital Costs	627,823	627,823	627,823	627,823	2,511,292
Oper + Capital Costs	3,473,213	2,446,338	2,499,644	2,374,591	10,793,786
Percent Oper + Cap. Costs Recovered	29.9%	40.4%	35.9%	26.8%	33.0%
Technical Assistance	843,834	843,834	843,834	843,834	3,375,336
Oper + Cap. + T.A. Costs	4,317,047	3,290,172	3,343,478	3,218,425	14,169,122
TOTAL GAIN (LOSS)	(/S3,279,597)	(/S2,302,247)	(/S2,445,284)	(/S2,582,325)	(/S10,609,453)
Percent Total Cost Recovery	24.0%	30.0%	26.9%	19.8%	25.1%

ANNEX EXHIBIT 1B.

TOTAL LEVEL OF COST RECOVERY: Solanda Health Center, 1991 (Current Suces)

	Quarter				YEAR
	Q1	Q2	Q3	Q4	
Operating Income	838,779	1,276,207	2,149,614	0	4,264,600
Operating Costs	3,003,845	4,445,028	4,160,409	0	11,609,282
Oper Gain (Loss)	(2,165,066)	(3,168,821)	(2,010,795)	0	(7,344,682)
Percent Operating Costs Recovered	27.9%	28.7%	51.7%	0.0%	36.7%
Capital Costs	771,112	771,112	771,112	0	2,313,336
Oper + Capital Costs	3,774,957	5,216,140	4,931,521	0	13,922,618
Percent Oper + Cap. Costs Recovered	22.2%	24.5%	43.6%	0.0%	30.6%
Technical Assistance	802,159	802,159	802,159	0	2,406,477
Oper + Cap. + T.A. Costs	4,577,116	6,018,299	5,733,680	0	16,329,095
TOTAL GAIN (LOSS)	(/S3,738,337)	(/S4,742,092)	(/S3,584,066)	/S0	(/S12,064,495)
Percent Total Cost Recovery	18.3%	21.2%	37.5%	0.0%	26.1%

Note: Some rows/columns are slightly off due to Lotus rounding.

ANNEX EXHIBIT 2A.

TOTAL LEVEL OF COST RECOVERY: Marcabelli Health Center, 1990 (Current Suces)

	Quarter				
	Q1	Q2	Q3	Q4	YEAR
Operating Income	118,837	200,529	500,647	997,000	1,817,013
Operating Costs	258,610	482,836	798,248	1,247,894	2,787,588
Oper Gain (Loss)	(139,773)	(282,307)	(297,601)	(250,894)	(970,575)
Percent Operating Costs Recovered	46.0%	41.5%	62.7%	79.9%	65.2%
Capital Costs	197,711	197,711	197,711	197,711	790,844
Oper + Capital Costs	456,321	680,547	995,959	1,445,605	3,578,432
Percent Oper + Cap. Costs Recovered	26.0%	29.5%	50.3%	69.0%	50.8%
Technical Assistance	361,643	361,643	361,643	361,643	1,446,572
Oper + Cap. + T.A. Costs	817,964	1,042,190	1,357,602	1,807,248	5,025,004
TOTAL GAIN (LOSS)	(S/699,127)	(S/841,661)	(S/856,955)	(S/810,248)	(S/3,207,991)
Percent Total Cost Recovery	14.5%	19.2%	36.9%	55.2%	36.2%

ANNEX EXHIBIT 2B.

TOTAL LEVEL OF COST RECOVERY: Marcabelli Health Center, 1991 (Current Suces)

	Quarter				
	Q1	Q2	Q3	Q4	YEAR
Operating Income	790,236	1,351,508	1,683,657	0	3,825,401
Operating Costs	679,411	1,510,553	1,359,442	0	3,549,406
Oper Gain (Loss)	110,825	(159,045)	324,215	0	275,995
Percent Operating Costs Recovered	116.3%	89.5%	123.8%	0.0%	107.8%
Capital Costs	242,835	242,835	242,835	0	728,505
Oper + Capital Costs	922,246	1,753,388	1,602,277	0	4,277,911
Percent Oper + Cap. Costs Recovered	85.7%	77.1%	105.1%	0.0%	89.4%
Technical Assistance	343,782	343,782	343,782	0	1,031,346
Oper + Cap. + T.A. Costs	1,134,018	1,695,290	2,027,439	0	4,856,747
TOTAL GAIN (LOSS)	(S/343,782)	(S/343,782)	(S/343,782)	S/0	(S/1,031,346)
Percent Total Cost Recovery	69.7%	79.7%	83.0%	0.0%	78.8%

ANNEX EXHIBIT 3.

TOTAL INCOME: Solanda Health Center. 1990 (Current Sucres)

Income Source	Quarter				YEAR
	Q1	Q2	Q3	Q4	
Fees and Sales	1,028,867	971,554	878,889	636,100	3,515,410
Interest	8,583	16,371	19,305	0	44,259
Total Oper Inc	1,037,450	987,925	898,194	636,100	3,559,669
Cash Subsidies: MAP	116,870	0	0	0	116,870
Salary Subsidies: MAP	1,502,495	1,021,914	1,030,552	663,184	4,218,145
Other Subsidies: MAP	384,000	384,000	384,000	384,000	1,536,000
Salary Subsidies: MSP	0	0	0	0	0
Total Subsidy Inc	2,003,365	1,405,914	1,414,552	1,047,184	5,871,015
TOTAL INCOME (Operating + Subsidy)	/S3,040,815	/S2,393,839	/S2,312,746	/S1,683,284	/S9,430,684

LABORATORY INCOME: Solanda Health Center. 1990

Income Source	Quarter				YEAR
	Q1	Q2	Q3	Q4	
Examination Fees	340,300	434,600	516,250	416,000	1,707,150
Interest	2,861	5,457	6,435	0	14,753
Total Operating Inc	343,161	440,057	522,685	416,000	1,721,903
Cash Subsidies: MAP	0	0	0	0	0
Salary Subsidies: MAP	426,574	294,523	284,861	82,447	1,088,405
Other Subsidies: MAP	89,856	89,856	89,856	89,856	359,424
Salary Subsidies: MSP	0	0	0	0	0
Total Subsidy Inc	516,430	384,379	374,717	172,303	1,447,829
TOTAL INCOME	/S859,591	/S824,436	/S897,402	/S588,303	/S3,169,732

PHARMACY INCOME: Solanda Health Center, 1990

Income Source	Quarter				
	Q1	Q2	Q3	Q4	YEAR
Sales	381,846	272,479	102,714	0	757,039
Interest	2,861	5,457	6,435	0	14,753
Inventory Adjustment	100,654	100,654	100,654	100,654	402,616
Total Operating Inc	485,361	378,590	209,803	100,654	1,174,408
Cash Subsidies: MAP	116,870	0	0	0	116,870
Salary Subsidies: MAP	135,917	48,172	122,679	164,896	471,664
Other Subsidies: MAP	78,336	78,336	78,336	78,336	313,344
Salary Subsidies: MSP	0	0	0	0	0
Total Subsidy Inc	331,123	126,508	201,015	243,232	901,878
TOTAL INCOME	/S816,484	/S505,098	/S410,818	/S343,886	/S2,076,286

MEDICAL CLINIC INCOME: Solanda Health Center, 1990

Income Source	Quarter				
	Q1	Q2	Q3	Q4	YEAR
Fees	306,721	264,475	259,925	220,100	1,051,221
Interest	2,861	5,457	6,435	0	14,753
Total Operating Inc	309,582	269,932	266,360	220,100	1,065,974
Cash Subsidies: MAP	0	0	0	0	0
Salary Subsidies: MAP	940,004	679,219	623,012	415,841	2,658,076
Other Subsidies: MAP	215,808	215,808	215,808	215,808	863,232
Salary Subsidies: MSP	0	0	0	0	0
Total Subsidy Inc	1,155,812	895,027	838,820	631,649	3,521,308
INCOME	/S1,465,394	/S1,164,959	/S1,105,180	/S851,749	/S4,587,282

ANNEX EXHIBIT 4.

TOTAL INCOME: Solanda Health Center, 1991 (Current Suces)

Income Source	Quarter				YEAR
	Q1	Q2	Q3	Q4	
Fees and Sales	838,779	1,233,274	2,120,175	0	4,192,228
Interest	0	42,933	29,439	0	72,372
Total Oper Inc	838,779	1,276,207	2,149,614	0	4,264,600
Cash Subsidies: MAP	2,121,770	291,862	0	0	2,413,632
Salary Subsidies: MAP	302,803	430,740	589,769	0	1,383,312
Other Subsidies: MAP	289,140	293,820	297,738	0	880,598
Salary Subsidies: MSP	1,089,600	1,089,600	1,089,600	0	3,268,800
Total Subsidy Inc	3,803,313	2,165,022	1,977,107	0	7,946,442
TOTAL INCOME	/S4,642,092	/S3,442,229	/S4,126,721	/S0	12,211,042
(Operating + Subsidy)					

LABORATORY INCOME: Solanda Health Center, 1991

Income Source	Quarter				YEAR
	Q1	Q2	Q3	Q4	
Examination Fees	552,200	734,900	956,900	0	2,244,000
Interest	0	14,311	9,813	0	24,124
Total Operating Inc	552,200	749,211	966,713	0	2,268,124
Cash Subsidies: MAP	1,060,885	145,931	0	0	1,206,816
Salary Subsidies: MAP	75,701	122,685	172,711		371,097
Other Subsidies: MAP	71,547	73,107	74,413		219,067
Salary Subsidies: MSP	0	0	0		0
Total Subsidy Inc	1,208,133	341,723	247,124	0	1,796,980
TOTAL INCOME	/S1,760,333	/S1,090,934	/S1,213,837	/S0	/S4,065,104

PHARMACY INCOME: Solanda Health Center, 1991

Income Source	Quarter				YEAR
	Q1	Q2	Q3	Q4	
Sales	91,980	315,864	633,656	0	1,041,500
Interest	0	14,311	9,813	0	24,124
Inventory Adjustaent	(69,601)	(69,601)	(69,601)		(208,803)
Total Operating Inc	22,379	260,574	573,868	0	856,821
Cash Subsidies: MAP	530,443	72,966	0	0	603,409
Salary Subsidies: MAP	151,401	245,370	294,703	0	691,474
Other Subsidies: MAP	64,047	65,607	66,913	0	196,567
Salary Subsidies: MSP	0	0	0	0	0
Total Subsidy Inc	745,891	383,943	361,616	0	1,491,450
TOTAL INCOME	/S768,270	/S644,517	/S935,484	/S0	/S2,348,271

MEDICAL CLINIC INCOME: Solanda Health Center, 1991

Income Source	Quarter				YEAR
	Q1	Q2	Q3	Q4	
Fees	264,200	252,111	599,220	0	1,115,531
Interest	0	14,311	9,813	0	24,124
Total Operating Inc	264,200	266,422	609,033	0	1,139,655
Cash Subsidies: MAP	530,442	72,965	0	0	603,407
Salary Subsidies: MAP	75,701	122,685	122,355		320,741
Other Subsidies: MAP	153,546	155,106	156,412		465,064
Salary Subsidies: MSP	1,089,600	1,089,600	1,089,600		3,268,800
Total Subsidy Inc	1,849,289	1,440,356	1,368,367	0	4,658,012
INCOME	/S2,113,489	/S1,706,778	/S1,977,400	/S0	/S5,797,667

ANNEX EXHIBIT 5

TOTAL COSTS: Solanda Health Center, 1990 (Current Sucres)

COST	Quarter				YEAR
	Q1	Q2	Q3	Q4	
Salaries:					
Paid By Center	0	0	0	381,560	381,560
Directly Paid By MAP	1,502,495	1,021,914	1,030,552	663,184	4,218,145
Directly Paid By MSP	0	0	0	0	0
Supplies	798,117	242,163	293,959	300,231	1,634,470
Transport	17,442	14,880	11,277	3,990	47,589
Rent Paid By MAP	384,000	384,000	384,000	384,000	1,536,000
Other Direct Costs	143,335	155,558	152,033	13,703	464,630
Total Oper Costs	2,845,390	1,818,515	1,871,821	1,746,768	8,282,494
Capital Costs	627,823	627,823	627,823	627,823	2,511,292
TOTAL COSTS	/S3,473,213	/S2,446,338	/S2,499,644	/S2,374,591	/S10,793,786

Note: Figures may vary slightly from other tables due to dollar conversions and *rounding*

BEST AVAILABLE DOCUMENT

LABORATORY COSTS: Solanda Health Center, 1990

COST	Quarter				YEAR
	Q1	Q2	Q3	Q4	
Salaries:					
Paid By Center	0	0	0	200,083	200,083
Directly Paid By MAP	426,574	294,523	284,861	82,447	1,088,405
Directly Paid By MSP	0	0	0	0	0
Supplies	164,094	111,244	173,551	226,340	675,229
Transport	5,814	4,950	3,759	1,330	15,863
Rent Paid By MAP	89,856	89,856	89,856	89,856	359,424
Other Direct Costs	35,117	44,809	39,261	6,467	125,654
Total Oper Costs	721,455	545,392	591,288	606,523	2,464,658
Capital Costs	406,068	406,068	406,068	406,068	1,624,272
TOTAL COSTS	/S1,127,523	/S951,460	/S997,356	/S1,012,591	/S4,088,930

ANNEX EXHIBIT 5 (Cont.)

PHARMACY COSTS: Solanda Health Center, 1990

COST	Quarter				YEAR
	Q1	Q2	Q3	Q4	
Salaries:					
Paid By Center	0	0	0	91,287	91,287
Directly Paid By MAP	135,917	48,172	122,679	164,896	471,664
Directly Paid By MSP	0	0	0	0	0
Supplies	437,025	70,195	39,651	26,570	573,411
Transport	5,814	4,360	3,759	1,330	15,263
Rent Paid By MAP	78,336	78,336	78,336	78,336	313,344
Other Direct Costs	28,318	33,079	35,810	5,638	102,845
Total Oper Costs	685,410	234,712	280,235	368,057	1,568,414
Capital Costs	98,393	98,393	98,393	98,393	393,572
TOTAL COSTS	/5783,803	/5333,105	/5378,628	/5466,450	/51,961,986

BEST AVAILABLE DOCUMENT

MEDICAL CLINIC COSTS: Solanda Health Center, 1990

COST	Quarter				YEAR
	Q1	Q2	Q3	Q4	
Salaries:					
Paid By Center	0	0	0	90,290	90,290
Directly Paid By MAP	940,004	679,219	623,012	415,841	2,658,076
Directly Paid By MSP	0	0	0	0	0
Supplies	196,398	60,754	80,757	47,321	385,830
Transport	5,814	4,360	3,759	1,330	15,263
Rent Paid By MAP	215,808	215,808	215,808	215,808	863,232
Other Direct Costs	79,901	77,670	76,362	1,598	226,131
Total Oper Costs	1,438,525	1,038,411	1,000,298	772,188	4,249,422
Capital Costs	123,362	123,362	123,362	123,362	493,448
TOTAL COSTS	/51,561,887	/51,161,773	/51,123,560	/5895,550	/54,742,870

ANNEX EXHIBIT 6

TOTAL COSTS: Solanda Health Center, 1991 (Current Budget)

COST	Quarter				YEAR
	Q1	Q2	Q3	Q4	
Salaries:					
Paid By Center	537,049	540,183	1,208,019	0	2,285,251
Directly Paid By MAP	302,303	490,740	589,769	0	1,383,312
Directly Paid By MSP	1,089,500	1,089,500	1,089,500	0	3,268,500
Supplies	637,825	1,768,057	826,932	0	3,232,814
Transport Paid By Cent	6,366	9,714	0	0	16,080
Transport Paid By MAP	39,141	43,821	47,739	0	130,701
Rent Paid By MAP	249,999	249,999	249,999	0	749,997
Other Direct Costs	141,062	152,914	148,351	0	442,327
Total Oper Costs	3,003,845	4,445,028	4,160,409	0	11,609,282
Capital Costs	771,112	771,112	771,112	0	2,313,336
TOTAL COSTS	/S3,774,957	/S5,216,140	/S4,931,521	/S0	/S13,922,618

Note: Figures may vary slightly from other tables due to dollar conversions and rou

LABORATORY COSTS: Solanda Health Center, 1991

COST	Quarter				YEAR
	Q1	Q2	Q3	Q4	
Salaries:					
Paid By Center	427,049	557,183	544,863	0	1,529,095
Directly Paid By MAP	75,701	122,685	172,711	0	371,097
Supplies	234,361	487,901	297,720	0	1,019,982
Transport (Center)	2,122	3,238	0	0	5,360
Transport (MAP)	13,047	14,607	15,913	0	43,567
Rent Paid By MAP	58,500	58,500	58,500	0	175,500
Other Direct Costs	34,118	42,547	55,848	0	132,513
Total Oper Costs	844,898	1,286,661	1,145,555	0	3,277,114
Capital Costs	498,746	498,746	498,746	0	1,496,238
TOTAL COSTS	/S1,343,644	/S1,785,407	/S1,644,301	/S0	/S4,773,352

ANNEX EXHIBIT 6 (Cont.)

PHARMACY COSTS: Solanda Health Center, 1991

COST	Quarter				YEAR
	Q1	Q2	Q3	Q4	
Salaries:					
Paid By Center	0	4,000	0	0	4,000
Directly Paid By MAP	151,401	245,370	294,702	0	691,474
Supplies	30,891	1,095,113	481,270	0	1,597,274
Transport (Center)	2,122	3,239	0	0	5,360
Transport (MAP)	13,047	14,607	15,913	0	43,567
Rent Paid By MAP	51,000	51,000	51,000	0	153,000
Other Direct Costs	31,919	38,081	27,751	0	97,751
Total Oper Costs	280,380	1,441,409	870,637	0	2,592,426
Capital Costs	120,849	120,849	120,849	0	362,547
TOTAL COSTS	/S401,229	/S1,562,258	/S991,486	/S0	/S2,954,973

MEDICAL CLINIC COSTS: Solanda Health Center, 1991

COST	Quarter				YEAR
	Q1	Q2	Q3	Q4	
Salaries:					
Paid By Center	110,000	79,000	663,156	0	852,156
Directly Paid By MAP	75,701	122,685	122,355	0	320,741
Directly Paid By MSP	1,089,600	1,089,600	1,089,600	0	3,258,800
Supplies	372,573	195,043	47,942	0	615,558
Transport (Center)	2,122	3,239	0	0	5,360
Transport (MAP)	13,047	14,607	15,913	0	43,567
Rent Paid By MAP*	140,499	140,499	140,499	0	421,497
Other Direct Costs	75,025	72,286	64,752	0	212,063
Total Oper Costs	1,878,567	1,716,958	2,144,217	0	5,739,742
Capital Costs	151,517	151,517	151,517	0	454,551
TOTAL COSTS	/S2,030,084	/S1,868,475	/S2,295,734	/S0	/S6,194,293

ANNEX EXHIBIT 7

TOTAL INCOME: Marcabelli Health Center, 1990 (Current Sucres)

Income Source	Quarter				YEAR
	Q1	Q2	Q3	Q4	
Fees and Sales	109,300	191,400	419,482	725,354	1,446,036
Interest	9,537	9,129	7,165	20,733	46,564
Donations	0	0	74,000	250,413	324,413
Total Oper Inc	118,837	200,529	500,647	997,000	1,817,013
Cash Subsidies: MAP	112,100	486,534	185,861	103,096	887,591
Salary Subsidies: MAP	0	0	32,000	96,000	128,000
Subsidies: Mun. Govt.	0	0	32,000	96,000	128,000
Total Subsidy Inc	112,100	486,534	249,861	295,096	1,143,591
TOTAL INCOME (Operating + Subsidy)	/S230,937	/S687,063	/S750,508	/S1,292,096	2,960,604

Note: Cash subsidies paid by MAP include transportation costs. Transportation cost estimated by extrapolating backwards from 1991 figures and adjusting for inflation

LABORATORY INCOME: Marcabelli Health Center, 1990

Income Source	Quarter				YEAR
	Q1	Q2	Q3	Q4	
Examination Fees	109,300	191,400	187,450	154,450	642,500
Interest	9,537	9,129	7,165	20,733	46,564
Donations	0	0	0	0	0
Total Operating Inc	118,837	200,529	194,615	175,183	689,164
Cash Subsidies: MAP	112,100	408,655	167,818	83,526	772,099
Salary Subsidies: MAP	0	0	0	0	0
Subsidies: Mun. Govt.	0	0	32,000	96,000	128,000
Total Subsidy Inc	112,100	408,655	199,818	179,526	900,099
TOTAL INCOME	/S230,937	/S609,184	/S394,433	/S354,709	/S1,589,263

PHARMACY INCOME: Marcabelli Health Center, 1990

Income Source	Quarter				YEAR
	Q1	Q2	Q3	Q4	
Sales	0	0	201,592	496,441	698,033
Interest	0	0	0	0	0
Donations	0	0	74,000	250,413	324,413
Profit(Loss) on Sales	0	0	30,440	74,962	105,403
Total Operating Inc	0	0	306,032	821,817	1,127,849
Cash Subsidies: MAP	0	77,879	18,043	19,570	115,492
Salary Subsidies: MAP	0	0	32,000	96,000	128,000
Subsidies: Mun. Govt.	0	0	0	0	0
Total Subsidy Inc	0	77,879	50,043	115,570	243,492
TOTAL INCOME	/50	/577,879	/5356,075	/5937,387	/51,371,341

Notes: Donations in Q3 comprised value of furniture given by municipality.
 For Q4, donation consisted of cash proceeds from Health Committee bingo game.

ANNEX EXHIBIT B

TOTAL INCOME: Marcabelli Health Center, 1991 (Current Suces)

Income Source	Quarter				YEAR
	Q1	Q2	Q3	Q4	
Fees and Sales	782,236	1,351,508	1,665,987	0	3,799,731
Interest	0	0	0	0	0
Donations	8,000	0	17,670	0	25,670
Total Oper Inc	790,236	1,351,508	1,683,657	0	3,825,401
Cash Subsidies: MAP	39,141	43,821	127,739	0	210,701
Salary Subsidies: MAP	0	0	0	0	0
Subsidies: Mun. Govt.	72,000	120,000	120,000	0	312,000
Total Subsidy Inc	111,141	163,821	247,739	0	522,701
TOTAL INCOME (Operating + Subsidy)	/S901,377	/S1,515,329	/S1,931,396	/S0	4,348,102

Note: Cash subsidies paid by MAP include transportation costs.

LABORATORY INCOME: Marcabelli Health Center, 1991

Income Source	Quarter				YEAR
	Q1	Q2	Q3	Q4	
Examination Fees	292,000	479,300	271,800	0	1,043,100
Interest	0	0	0	0	0
Donations	0	0	0	0	0
Total Operating Inc	292,000	479,300	271,800	0	1,043,100
Cash Subsidies: MAP	19,571	21,911	63,870	0	105,352
Salary Subsidies: MAP	0	0	0	0	0
Subsidies: Mun. Govt.	72,000	120,000	120,000	0	312,000
Total Subsidy Inc	91,571	141,911	183,870	0	417,352
TOTAL INCOME	/S383,571	/S621,211	/S455,670	/S0	/S1,460,452

ANNEX EXHIBIT 9 (Cont.)

PHARMACY INCOME: Marcabelli Health Center, 1991

Income Source	Quarter				YEAR
	Q1	Q2	Q3	Q4	
Sales	425,922	757,783	1,211,283	0	2,394,988
Interest	0	0	0	0	0
Donations	3,000	0	17,670	0	25,670
Profit(Loss) on Sales	64,314	114,425	182,904		361,643
Total Operating Inc	498,236	872,208	1,411,857	0	2,782,301
Cash Subsidies: MAP	19,570	21,910	63,869	0	105,349
Salary Subsidies: MAP	0	0	0	0	0
Subsidies: Mun. Govt.	0	0	0	0	0
Total Subsidy Inc	19,570	21,910	63,869	0	105,349
TOTAL INCOME	/5517,806	/8894,118	/51,475,726	/50	/52,987,550

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ANNEX EXHIBIT 9

TOTAL COSTS: Marcabelli Health Center, 1990 (Current Suces)

COST	Quarter				YEAR
	Q1	Q2	Q3	Q4	
Salaries:					
Paid By Center	160,000	210,000	244,000	231,355	845,355
Directly Paid By MAP	0	0	0	0	0
Supplies	33,300	185,088	487,877	888,272	1,595,137
Transport	30,200	31,568	36,086	76,542	174,396
Rent	12,000	11,000	16,500	32,500	72,000
Other Direct Costs	22,510	45,180	13,785	19,225	100,700
Total Oper Costs	258,610	482,836	798,248	1,247,894	2,787,588
Capital Costs	197,711	197,711	197,711	197,711	790,844
TOTAL COSTS	/5456,321	/5680,547	/5995,959	/51,445,605	/53,578,432

LABORATORY COSTS: Marcabelli Health Center, 1990

COST	Quarter				YEAR
	Q1	Q2	Q3	Q4	
Salaries:					
Paid By Center	160,000	210,000	180,000	180,000	730,000
Directly Paid By MAP	0	0	0	0	0
Directly Paid By MSP	0	0	0	0	0
Supplies	33,900	185,088	16,775	83,080	318,843
Transport	30,200	31,568	18,043	19,571	99,382
Rent	12,000	11,000	8,250	16,250	47,500
Other Direct Costs	22,510	45,180	13,785	8,050	89,525
Total Oper Costs	258,610	482,836	236,853	306,951	1,285,250
Capital Costs	197,711	197,711	147,220	147,229	689,881
TOTAL COSTS	/5456,321	/5680,547	/5384,083	/5454,180	/51,975,131

Note: Q1 and Q2 carry all depreciation. A portion of Health Center capital goods are shifted to pharmacy beginning in Q3 when pharmacy opened.

ANNEX EXHIBIT 9 (Cont.)

PHARMACY COSTS: Marcabelli Health Center, 1990

COST	Quarter				YEAR
	Q1	Q2	Q3	Q4	
Salaries:					
Paid By Center	0	0	54,000	51,355	115,355
Directly Paid By MAP	0	0	0	0	0
Directly Paid By MSP	0	0	0	0	0
Supplies	0	0	471,102	805,132	1,276,234
Transport	0	0	18,043	56,971	75,014
Rent	0	0	2,250	16,250	24,500
Other Direct Costs	0	0	0	11,175	11,175
Total Oper Costs	0	0	561,395	940,943	1,502,338
Capital Costs	0	0	50,481	50,482	100,963
TOTAL COSTS	/50	/50	/561,876	/5991,425	/51,603,301

Note: Pharmacy opened in August. MSP drug program advanced pharmacy approximately /\$975,000 in goods. Approximately /\$650,000 was returned unsold in 1991. This amount has been subtracted from total for this table.

All totals may vary slightly from other tables due to dollar conversions and rounding.

ANNEX EXHIBIT 10

TOTAL COSTS: Marcabelli Health Center, 1991 (Current Sucres)

COST	Quarter				YEAR
	Q1	Q2	Q3	Q4	
Salaries:					
Paid By Center	284,949	412,800	330,638	0	1,028,387
Directly Paid By MAP	0	0	0	0	0
	0	0	0	0	0
Supplies	319,321	990,882	948,725	0	2,258,928
Transport Paid by MAP	39,141	43,821	47,739	0	130,701
Rent	24,000	26,000	30,000	0	80,000
Other Direct Costs	12,000	37,050	2,340	0	51,390
Total Oper Costs	679,411	1,510,553	1,359,442	0	3,549,406
Capital Costs	242,835	242,835	242,835	0	728,505
TOTAL COSTS	/S922,246	/S1,753,388	/S1,602,277	/S0	/S4,277,911

Note: Figures may vary by several sucres from other tables due to rounding and dollar conversions.

LABORATORY COSTS: Marcabelli Health Center, 1991

COST	Quarter				YEAR
	Q1	Q2	Q3	Q4	
Salaries:					
Paid By Center	211,930	293,790	231,540	0	737,250
Directly Paid By MAP	0	0	0	0	0
Directly Paid By MSP	0	0	0	0	0
Supplies	18,510	53,810	107,364	0	179,684
Transport Paid By MAP	19,571	21,911	23,870	0	65,352
Rent	12,000	13,000	15,000	0	40,000
Other Direct Costs	12,000	23,590	1,040	0	36,630
Total Oper Costs	274,011	405,101	378,814	0	1,058,926
Capital Costs	180,832	180,832	180,832	0	542,496
TOTAL COSTS	/S454,843	/S586,933	/S559,646	/S0	/S1,601,422

ANNEX EXHIBIT 10 (Cont.)

PHARMACY COSTS: Marcabeli Health Center, 1991

COST	Quarter				YEAR
	Q1	Q2	Q3	Q4	
Salaries:					
Paid By Center	73,019	119,010	99,098	0	291,127
Directly Paid By MAP	0	0	0	0	0
Directly Paid By MSP	0	0	0	0	0
Supplies	300,811	937,072	841,361	0	2,079,244
Transport Paid By MAP	19,570	21,910	23,369	0	65,349
Rent	12,000	13,000	15,000	0	40,000
Other Direct Costs	0	13,460	1,300	0	14,760
Total Oper Costs	405,400	1,104,452	980,628	0	2,490,480
Capital Costs	62,003	62,003	62,003	0	186,009
TOTAL COSTS	/S467,403	/S1,166,455	/S1,042,631	/S0	/S2,676,489

Note: Pharmacy opened in August. Supplies costs for 1991 equal to purchases minus returns.

ANNEX EXHIBIT 11.

PURCHASES, SALES, VALUE OF INVENTORY: Solanda Pharmacy, 1989-1991 (Current Sucres)

	Purchases	Sales	Period-End Inventory	Net Gain for Period
31 December 1989	1,041,732	24,083	1,017,649	(1,017,649)
31 December 1990	372,933	775,547	615,035	402,514
31 October 1991	1,534,798	1,302,795	847,038	(232,003)
Total	2,949,463	2,102,425	847,038	

Quarterly Income Adjustaent for 1990	100,654
Quarterly Income Adjustaent for 1991	(69,601)

Note: December 1989 refers to previous 8 months; December 1990 refers to previous 12 months; October 1991 refers to previous 10 months.

PROFITS AND LOSSES ON PHARMACY SALES: Marcabelli Health Center Pharmacy, 1990-1991 (Current Sucres)

Period	Profit (Loss)
August-September 1990*	30,440
October-December 1990*	74,963
January-March 1991	64,314
April-June 1991	114,425
July-September 1991*	182,904

* Estimated

ANNEX EXHIBIT 12
 DEPRECIATION: Solanda Health Center (Current Dollars)

Capital Good	Cost Basis	Recov. Period	1990 Charge	1991 Charge

Furniture		10-Years		
(1987)	938.11		93.81	93.81
(1988)	3,237.09		323.71	323.71
Appliances		10-Years		
(1988)	736.55		73.66	73.66
Office Equip.		5-Years		
(1988)	3,857.23		771.45	771.45
(1989)	111.96		22.39	22.39
Medical Equip.		5-Years		
Laboratory				
(1987)	216.36		43.27	43.27
(1988)	7,311.11		1,462.22	1,462.22
(1989)	1,729.45		345.89	345.89
Med. Clinic				
(1988)	883.24		176.65	176.65
=====				
Current Dollar Depreciation Charge			3,313.05	3,313.05
=====				
Current Sucre Depreciation Charge			/S2,511,288	/S3,084,445
By Cost Center:				
Laboratory			1,624,271	1,994,982
Pharmacy			393,572	483,397
Medical Clinic			493,446	606,066
=====				
Average Sucre Conversion Rates For Dollar			758	931

 Note: Conversions may vary by several sucres due to rounding. Depreciation for furniture, appliances, and office equipment divided equally among the three cost centers. Medical equipment costs assigned as indicated.

ANNEX EXHIBIT 13

DEPRECIATION: Marcabeli Health Center (Current Dollars)

Capital Good	Cost Basis	Recov. Period	1990 Charge	1991 Charge
Furniture (1988)	623.37	10-Years	62.34	62.34
Appliances (1988)	450.00	10-Years	45.00	45.00
Office Equip. (1988)	112.96	5-Years	22.59	22.59
Medical Equip. Laboratory (1988)	4,567.01	5-Years	913.40	913.40
Current Dollar Depreciation Charge			1,043.33	1,043.33
Current Sucre Depreciation Charge			/5790,844	/5971,341
By Cost Center:				
Laboratory			689,881	723,329
Pharmacy			100,963	248,013
Average Sucre Conversion Rates For Dollar			758	931

Note: Conversions may vary by several sucres due to rounding and dollar conversions. Pharmacy opened in Q3/90. At that time furniture and office equipment were shifted from the laboratory to the pharmacy. This adjustment is reflected in the 1990 figures.

ANNEX EXHIBIT 14

COST PER PATIENT VISIT: Solanda Health Center Medical Clinic, 1990-1991 (Current and Real Sucres)

Quarter	1990				1991			AVERAGE
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	
Operating Costs	1,438,525	1,038,411	1,000,298	772,188	1,878,567	1,716,958	2,144,217	1,427,023
Number of Visits	1,434	1,238	985	950	1,053	1,217	1,231	1,158
Oper Cost Per Visit	1,003	839	1,016	813	1,784	1,411	1,742	1,230
Real Oper Cost/Visit (Q3/91 = 100)	1,796	1,342	1,503	1,089	2,141	1,524	1,742	1,591
Capital Costs	123,362	123,362	123,362	123,362	151,517	151,517	151,517	135,428
Oper + Cap. Costs	1,561,887	1,161,773	1,123,660	895,550	2,030,084	1,868,475	2,295,734	1,562,452
Oper + Cap. Cost/Visit	1,089	938	1,141	943	1,928	1,535	1,865	1,348
Real Oper + Cap. Cost/Visit	1,950	1,501	1,688	1,263	2,313	1,658	1,865	1,748
Charge Per Visit	200	200	200	200	200	200	400	
Real Charge Per Visit	358	320	296	268	240	216	400	
Real Oper + Capital Cost Recovery Per Visit	18.4%	21.3%	17.5%	21.2%	10.4%	13.0%	21.4%	
Inflation Index (Q3/91 = 100)	1.79	1.6	1.48	1.34	1.2	1.08	1	

ANNEX EXHIBIT 15

COST PER PATIENT/EXAM: Solanda Health Center Laboratory, 1990-1991 (Current and Real Sucres)

	1990				1991			AVERAGE
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	
Operating Costs	721,455 =	=	=	=	844,898 =	=	=	223,765
Number of Patients	564	742	909	523	599	802	907	721
Oper Cost Per Patient	1,279	0	0	0	1,411	0	0	384
Real Oper Cost/Patient (Q3/91 = 100)	2,290	0	0	0	1,693	0	0	569
Number of Exams	1,054	1,491	1,652	978	1,070	1,326	1,399	1,281
Oper Cost Per Exam	684	0	0	0	790	0	0	211
Real Oper Cost/Exam	1,225	0	0	0	948	0	0	310
Capital Costs	406,068	406,068	406,068	406,068	498,746	498,746	498,746	445,787
Oper + Cap. Cost	1,127,523	406,068	406,068	406,068	1,343,644	498,746	498,746	669,552
Oper + Cap Cost/Exam	1,070	272	246	415	1,256	376	357	570
Real Oper + Cap. Cost/Exam	1,915	436	364	556	1,507	406	357	791
Ave. Charge/Blood Exam	467	467	600	600	600	600	883	
Real Charge/Blood Exam	836	747	888	804	720	648	883	
Real Blood Exam Charge As Percent of Total Exam Cost	43.7%	171.5%	244.1%	144.5%	47.8%	159.5%	247.7%	
Inflation Index (Q3/91 = 100)	1.79	1.6	1.48	1.34	1.2	1.08	1	

Note: It is not possible to calculate cost recovery for examinations since the data do not permit the disaggregation of the total cost per exam by type of exam.

ANNEX EXHIBIT 16

COST PER PATIENT/EXAM: Marcabelli Health Center Laboratory, 1990-1991 (Current and Real Sucres)

	1990				1991			AVERAGE
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	
Operating Costs	258,610	680,547	384,083	454,180	274,011	180,832	180,832	344,728
Number of Patients	229	346	333	240	337	742	254	354
Oper Cost Per Patient	1,129	1,967	1,153	1,892	813	244	712	1,130
Real Oper Cost/Patient (Q3/91 = 100)	2,021	3,147	1,707	2,536	976	263	712	1,623
Number of Exams	-	-	-	-	374	826	-	600
Oper Cost Per Exam	-	-	-	-	733	219	-	476
Real Oper Cost/Exam	-	-	-	-	879	236	-	558
Capital Costs	-	-	-	-	180,832	586,933	-	383,883
Oper + Cap. Cost	-	-	-	-	454,843	767,765	-	611,304
Oper + Cap Cost/Exam	-	-	-	-	1,216	929	-	1,073
Real Oper + Cap. Cost/Exam	-	-	-	-	1,459	1,004	0	1,232
Ave. Charge/Blood Exam	433	433	433	433	633	633	663	
Real Charge/Blood Exam	775	693	641	580	760	684	663	
Real Blood Exam Charge As Percent of Total Exam Cost	-	-	-	-	52.0%	68.1%	-	
Inflation Index (Q3/91 = 100)	1.79	1.6	1.48	1.34	1.2	1.08	1	

Note: It is not possible to calculate cost recovery for examinations since the data do not permit the disaggregation of the total cost per exam by type of exam.

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