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**MATERNITY SERVICES IN COCHABAMBA, BOLIVIA:
COSTS, COST-RECOVERY, AND CHANGING MARKETS
REPORT OF A FIELD STUDY**

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ABBREVIATIONS

ALOS	Average length of stay
HGU	Hospital German Urquidi
HQ	Hospital Quillacollo
IEC	Information, education, and communication
JSI	John Snow, Inc.
LOS	Length of stay
MPSSP	Ministry of Social Welfare and Public Health

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EXECUTIVE SUMMARY

This study explores aspects of the market for maternity services in the Cochabamba region of Bolivia. Its specific goal is to identify the trends in costs, utilization, and cost-recovery and their implications for the financial and economic viability of the system of services in the region. This analysis will contribute to the design of financing strategies which support desired improvements in the quality and utilization of maternity services.

The Hospital German Urquidi serves as a referral facility as well as a primary provider for maternity and pediatrics services for the Cochabamba region. During the period from 1985 to 1990, utilization of hospital services changed significantly. The total number of discharges declined by a quarter, reflecting in large part a 40% decline in the number of normal deliveries at the institution. The number of patients treated for complications from abortions also fell significantly, while the number of cesarian deliveries rose by 35%.

Despite this decline in the number of patients treated at the hospital, the number of patient days increased by 56% from 1985-90, resulting in an increase in the average length of stay from 2.48 to 5.14 days. This indicates a changing role for the hospital as it treats more complicated cases. Simpler cases such as normal deliveries are being seen more often in other facilities, particularly in the growing private health sector in Cochabamba. The growth in the number of deliveries at a small district hospital in nearby Quillacollo (up 65% from 1985-90) indicates that mid-level public institutions also play an increasingly important role in maternity services in the region.

Since 1987, the hospital has been responsible for recovering all of its costs (excluding permanent personnel and capital expenditures) through the charging of fees to its patients. An analysis of the costs and revenues of the hospital showed that it is recovering nearly all of its nonpersonnel recurrent costs (98% cost recovery in 1990). While some services (particularly normal deliveries) generate significantly more revenues than their average costs, others (including outpatients, complicated cases, and pediatrics) are being subsidized from these excess revenues.

This pattern of cross-subsidization, combined with the changing role of the hospital in the market, indicates potential problems for the hospital's future financial viability. If the current trend continues to expand the hospital's role as a referral institution treating largely complicated cases (who are less able to pay the costs of their care) while normal deliveries are seen elsewhere within the health system, the hospital is likely to encounter difficulties in generating sufficient revenues to cover its costs.

This report recommends several alternative strategies for financing improved maternal and neonatal services in the Cochabamba region. These include strategies focused on the Hospital German Urquidi itself (e.g., sale of packages of prenatal and delivery services) and system-wide strategies designed to include a range of public and private providers. One such system-wide strategy would create an insurance fund for maternity services. Participants in the fund--encompassing both public and private providers--would pay a premium for each maternity patient they see. In return, any patient requiring referral due to complications would be treated at no additional cost at the hospital. The costs of referral treatment would be paid out of the fund. This fund could also be linked to training, quality assurance, and consumer education in order to enhance the quality of maternity services in the Cochabamba region.

I. INTRODUCTION

This study explores aspects of the market for maternity services in the Cochabamba region. Central to this analysis is a study of the utilization, costs, and cost-recovery experience of the Hospital German Urquidi (HGU), the central referral facility for maternity services in Cochabamba, Bolivia, and the linking of that experience to that of other providers serving this population. Its specific goal is to identify the trends and their implications for the financial and economic viability of the system of services. This analysis will contribute to the design of financing strategies which support desired improvements in the quality and utilization of maternity services.

This study was undertaken as part of a set of MotherCare activities designed to help improve the utilization and quality of maternal and neonatal services in Cochabamba, Bolivia. Additional studies to be carried out by MotherCare include a household survey and qualitative studies to examine patterns of service utilization as well as client attitudes, preferences, and behaviors within the overall medical service delivery context. The results of these studies will be used to develop an information, education, and communication (IEC) campaign to promote increased utilization of appropriate maternal and neonatal services. The analysis here is not intended as an academic exercise. Its goal, as with all of the MotherCare activities, is to support the development of initiatives which will improve the utilization and quality of effective maternal and neonatal services.

II. BACKGROUND

The Hospital German Urquidi, operated by the Ministry of Social Welfare and Public Health (MPSSP), serves as a referral setting as well as a primary provider for maternity and pediatrics services for the Cochabamba region. While housed in a single institution and, ultimately, drawing on many of the same revenues, the two services are treated as separate with most operations, staff, and support functions managed independently for each. This study is focused primarily on the maternity side of the institution.

The interest in the cost and cost-recovery experience of the Hospital German Urquidi reflects a number of concerns. In 1987, as part of a "privatization" effort, the MPSSP initiated a local cost financing program which called for the establishment of fees for services rendered at all MPSSP facilities. Under this program, the MPSSP continues to pay the costs of permanent personnel and capital expenditures, but support for other recurrent operating costs is eventually to be recovered from patient fees. The experience of the hospital over the past few years provides insight into the long-run viability of that goal and its possible implications for the use of services in the region.

Of equal importance, during this same period there has been a decline in the number of deliveries at the Hospital German Urquidi. Some have interpreted this change as a response to the cost-recovery effort and are concerned that appropriate patterns of utilization cannot be achieved when patients are required to pay for services. Institutional birthing is generally underutilized in Cochabamba. Any further limitations on use generated by patient fees are seen as conflicting with the overall need to raise the quality of services and to promote safer maternal experiences by encouraging the appropriate use of services. Since the hospital is the referral facility for the Cochabamba region, changes in its utilization experience will have to be interpreted in the context of maternal and neonatal services in the region as a whole.

To facilitate this comparison, an analysis was made of the utilization and cost-recovery experience of the district hospital in Quillacollo, one of the two districts which make up the Cochabamba region. Its location in a rapidly growing periurban community relatively close to the referral hospital makes its experience particularly relevant to an assessment of overall market behavior. The presentation that follows includes the Quillacollo experience where it is applicable.

Clearly both of these issues are central to any assessment of cost-recovery efforts. The move to cost-recovery is typically a response to inadequate public resources to support an appropriate level and quality of services. The capacity to generate adequate revenues through user fees depends on effective pricing and the impacts of prices on utilization. Yet the generation of revenues is not the objective of the system. Producing adequate revenues while failing to provide needed services is not an acceptable outcome. Understanding the relationships among prices, pricing policies, and utilization of services is essential to the design and implementation of effective cost-recovery programs. This study contributes to that understanding, for maternal and neonatal services in the Cochabamba region.

III. PRODUCTION OF SERVICES--UTILIZATION AND OUTPUT

The market for maternity services in Cochabamba has been changing significantly during the past few years. In general, women in the region have had a high proportion of deliveries outside of the medical care system and unattended by trained personnel. This has been particularly true of the rural population. As the Cochabamba region is becoming home for a growing proportion of such women through the processes of immigration and urbanization, the potential for significant increases in the overall volume of maternity services is considerable.

Some evidence of these changes on the supply side is demonstrated by the visible increase in the number of private physicians in the region, almost all of whom emphasize deliveries as a central part of their practice. While no accurate count of new practitioners was possible for the region as a whole, in Quillacollo, the number of practitioners in the immediate area of the hospital increased from four to over 24 in the past three years. No clear conclusions can be drawn, however, as to the volume of services represented by these visible supply changes. The general oversupply of physicians, the lack of alternative employment, and the relatively low cost of entry encourages the establishment of a new practice even in a weak market.

A. Inpatient Services

Evidence of changes in the market for maternity services is also found in the experience of the two study hospitals. The two experiences, while considerably different, are quite complementary in the context of the system as a whole. The utilization experience of the Hospital German Urquidi is presented in Tables 1 and 2 and Figures 1-2. It reflects, in general, a continuing move toward more complex procedures, appropriate for a referral institution. Between 1987 and 1990, the HGU experienced a decline in the number of discharges of 24%. This decline in discharges was concentrated almost entirely in a reduction in the number of normal deliveries and abortions.¹ During the same period, the hospital produced an increased number of cesarian deliveries. These three categories of care represented 88% of all cases in 1990.

¹ The category "Abortions" refers to treatment of complications from incomplete abortions performed outside the hospital.

However, while the number of discharges declined over the period, the intensity of use of the hospital increased. Occupancy rates at the end of the period (65.61%) were 44% higher than at the beginning (45.56%). Table 2 presents these data more clearly. While discharges declined from 1987 through 1990, total days of care showed little change over the same period. This reflects the fact that HGU had a continuously rising average length of stay (ALOS), increasing from 2.48 days to 5.14 days over the six year period.

The basis for the longer ALOS is made clearer when data for the six major diagnoses in 1990 are examined. These data are presented in Tables 3 and 4. The ALOS for the hospital as a whole in 1985 was 2.48 days. In 1990, the ALOS for normal deliveries was 2.58 days, but these represented only half of the discharges, with all other categories having significantly longer ALOS. The six categories of care in Table 3 represent 96% of all cases in 1990 and changes in the mix of services will continue to have implications for use of resources within the hospital.

The wide range of lengths of stay within each category (see Table 4) indicates considerable differences in the degree of complexity within the categories as well as among them. In the subsequent analysis, a distinction is made between complicated and noncomplicated cases for cesarians and abortions based on generalized clinical assessments from the hospital staff. In general, complicated cases involve an associated infection and always require considerably more time in the hospital. While no longitudinal analysis was made, the staff reports an increase in the average complexity within abortions and cesarians. This suggests that less complicated cases are being treated in other settings.

The above hypothesis is supported by the experience of the Hospital Quillacollo (HQ), even though it demonstrates a somewhat different pattern over the period (see Tables 5 and 6 and Figures 3 and 4). While there has been little change overall in the number of discharges, the mix of services has changed continuously over the six-year period. In 1985, maternity related services--deliveries, cesarians, and abortions--represented less than 40% of the total output of the hospital. By 1990, that share had increased to almost 60%, making the district hospital more and more a maternity institution. In contrast to HGU, deliveries increased from less than 35% of total cases in 1985 to over 52% in 1990, an increase attributed by the hospital director not only to growth in the market but, more importantly, to the development of a number of Mothers' Clubs which serve as outreach for the institution. The increasing number of cesarians reflects both the availability of a surgeon in the hospital and a growing demand for such services among the population being served.

The growth in provision of maternity services in HQ reflects a growing role in the provision of uncomplicated hospital based maternity services. The data in Table 6 and Figure 4 illustrate this point. ALOS for both deliveries and cesarians is considerable lower than the stays in HGU. An assessment of the distribution of LOS indicates a very narrow range of experience, with almost all of the cases concentrated within the range for noncomplicated cases (7 or fewer days for cesarians and 4 or fewer days for normal deliveries). These data suggest that, while the categories may be similar, the patients in HQ represent mostly noncomplicated cases, while the patients in HGU represent a much wider range of complexity and resource requirements.

B. Outpatient Services

The production of outpatient services also changed considerably over the six-year period. For HGU, total outpatient visits increased by almost 45% from 1985 through 1990, a period in which prenatal visits were almost constant (see Table 7 and Figure 5). For non-prenatal visits alone, the increase over

the period was more than 115%. As a result, prenatal visits, which accounted for over 58% of all outpatient visits in 1985, accounted for only 38% in 1990.

These changes need to be related to the overall decline in deliveries as a component of the inpatient activities of the hospital. Table 8 presents the relationship between the production of outpatient visits for prenatal care and the volume of deliveries from 1985 through 1990. It shows that prenatal visits have not declined in the face of a reduced volume of deliveries. In 1985, HGU averaged .71 prenatal visits for every delivery in the hospital. For 1990, the average had increased to .92. If only first visits are counted and all those making prenatal visits at HGU are assumed to have delivered there, approximately one-third of the women delivered in 1985 had received prenatal services from the institution. In 1990, almost one-half of the deliveries had received such attention.

While the data suggest some increase in the proportion of women delivered in the hospital who have received prenatal care from the hospital, the average number of visits for each falls considerably short of the hospital's goal of 4 visits per delivery. In 1985, the hospital averaged 2.08 visits per initial visit while, in 1990, that average had fallen to 1.88, suggesting somewhat greater success in the numbers receiving some prenatal attention but no progress toward earlier and more extensive use of prenatal services for the average maternity patient in the institution.

It should be emphasized that the above data only refer to the use of prenatal services at HGU. Clearly some women may arrive at the hospital for delivery having received prenatal care from other sources but there is little indication that this occurs sufficiently frequently to modify the above observations. Conversely, it is not known whether the women who receive prenatal services are the same women who deliver in the hospital. It is possible that some of the women who use HGU prenatal services deliver in other settings. To the extent that this occurs, the figures overstate the amounts of prenatal care received by those who deliver in HGU.

A similar analysis was made of the experience in HQ, although it was not possible to distinguish between initial prenatal visits and follow-up visits (see Table 9). During the six-year period, deliveries increased by 65%. During the same period, prenatal visits increased by almost 400%. As a result, the hospital produced 2.52 prenatal visits per delivery in 1990 as compared to .84 at the beginning of the period. The director of the hospital attributed much of the increase in prenatal visits to the implementation of a feeding supplementation program which provided an incentive for seeking prenatal care. (It was also noted that the interruption of such a program at HGU had resulted in a drop in prenatal services in the current year.)

As with the inpatient experience, the changing patterns of outpatient services suggest an increasing role for the district hospital in the ongoing production of routine maternity services. For the referral hospital, even the outpatient department demonstrates an increase in production of non-routine services and, perhaps, a growing share of more serious deliveries arriving with less prenatal care and possibly more serious conditions. Such an observation is only suggestive. No conclusion about the clinical nature of these patients can be correctly derived without specific analyses not feasible for the current study.

IV. COSTS OF PRODUCTION

The changes noted above only refer to the mix of types of patients (diagnostic categories) receiving services from the referral hospital. This section explores the likely impact of these changes on the cost of producing maternity services in HGU. The analysis examines three issues:

1. How much does it cost the hospital to produce each unit of service?
2. How many units of service of each type are used on average by a patient in each of the major diagnostic categories?
3. How much does it cost the hospital to produce the services required to treat each of the major diagnostic categories?

The results of the three analyses permit an assessment of how the changes in the mix of diagnostic categories are likely to affect the overall costs of production of the HGU.

The analysis explores each of these questions in terms of the experience of the hospital in 1990 and uses its actual expenditures to develop estimates of unit costs and costs per diagnosis. With the exception of administration expenditures, all costs incurred by HGU are specifically allocated to maternity or pediatrics, as appropriate, by the accounting office. For this reason, it was possible to limit the analysis to maternity services only.

A breakdown of total costs is presented in Table 10. Each of the rows represents a category of expenditure such as personnel or paper products. These categories are often referred to as "line items" since they represent items in the official budget of the hospital. Each of the columns represents the service or activity on which the expenditure was made.² In 1990, total costs of production for all maternity services in HGU were 892,132 Bs. It is this sum that needs to be allocated among the individual services to carry out the desired analyses.

The activities which make up the columns are of two types--final services and activities which support final services. As an example, the first row in the table distributes the total expenditure for permanent personnel among the activities which used them. Personnel in the left-hand columns, from Outpatients to Surgical Theater/Delivery Room, provided services directly to patients in the hospital. Personnel in the columns to the right, from Laboratory to Administration, products such as medicines or meals, which were used by the first set of personnel to treat the patients, or supported the operation of the hospital overall. To determine the total costs of these "final" services to patients, it is necessary to allocate all of the other costs to the final services they support. In the current example, this means allocating all of the costs in the right-hand columns to the appropriate activities on the left.

The basis for allocation differs among the categories of expenditure. For certain expenditures, such as food and pharmaceuticals, it was possible to identify the final use of output through records. For

² The total costs of maternity is the sum of all of the rows in the table less the pediatrics personnel column and the share of administration costs which are allocated to pediatrics. Administration costs were allocated to activities in proportion to personnel costs. The personnel portion of pediatrics costs was included in this table to demonstrate the basis for the distribution. In the analysis that follows, no pediatrics costs are included.

these categories, the distribution of expenditures reflects the actual distribution of products, e.g. pharmacy orders or meals requested, based on a survey made by the hospital staff for May 1990 by the hospital staff. For food service, the distribution of food serves as a good indicator of the distribution of costs. For pharmaceuticals, some adjustment was made to recognize that the average costs of drugs for outpatient patients per visit was lower than the average cost of drugs for a day in the hospital. For most of the other categories, expenditures were distributed in proportion to the distribution of personnel expenditures which served as a general indicator of the overall volume of resource use.³

The procedure for allocating costs to final services was implemented in a stepwise process, with each category of intermediate service allocated in turn to those categories not yet allocated. This "step-down" process is displayed in the middle of Table 10. The expenditures for the services at the right of Table 10 were each allocated in order to all services to the left, gradually working toward a consolidated distribution of total expenditures associated with each of the final service producing areas in the hospital. The data on total costs for maternity are presented at the bottom of the table.

A. Unit Costs of Services

The determination of unit costs for services started with the results of the above process. Two additional breakdowns were required to support the analysis of impacts of a changing mix of diagnostic categories on the overall costs of the hospital. Because the cost-recovery targets of the HGU do not include the costs of permanent personnel, separate estimates were made of the personnel and non-personnel unit costs. The estimates of unit costs without permanent personnel are estimates of the costs that need to be recovered by the hospital. The estimates of total unit costs provide some indication of the general level of subsidy for publicly provided services.

The second type of adjustment reflects the fact that some of the costs of operation, such as administration and permanent personnel, are essentially unaffected by differences in the volume of services while other costs, such as pharmaceuticals, vary with the volume of output. The total costs identified in Table 10 reflect both fixed and variable costs at the particular levels of output experienced by HGU in 1990. The analysis of unit costs needs to differentiate these two types of cost components since changes in the volume of production will affect each differently. For example, as production increases, the unit fixed cost will decrease since the same expenditure will be spread over more units of output. At the same time, unit variable costs will not change since these expenditures are associated with individual patient services. Therefore, total fixed costs will stay the same and total variable costs will increase as output increases.⁴

The results of the analysis of unit costs are presented in Table 11. The first section of the table presents the total expenditures in 1990 for each unit of final service. Data for the general ward were separated into surgical and nonsurgical cases. At the present time, there are nine beds in the general ward specifically designated for surgical patients. All staff and supplies are pooled for the two types of patients, giving each essentially the same unit costs. The exception to this is the use of medicines which could be

³ The process for allocating costs is described more fully in Day and Rosenthal 1990.

⁴ These observations will not hold true over very wide differences in production which might require changes in permanent staffing patterns or reconfiguration of the bed allocation among the services of the hospital. Under such conditions, all costs are variable.

specifically attributed to each category. As is shown in the table, surgical patients, who accounted for less than 25% of the days in the general ward, accounted for over 50% of the costs of medicines. All of the other services occupy distinct space and utilize their own designated personnel.

In the analysis, no distinction is made between the surgical theater and the delivery room. Although staff are separately assigned on paper, physicians working in the areas report that while there are separate surgical and delivery suites, all resources and supplies as well as personnel are pooled for the area. As a result, there is no basis for distinguishing among these functions with respect to costs and one unit of use for delivery is treated as identical to a unit of use for surgery for costing purposes.

Total expenditures for each service have been separated into permanent personnel costs, other fixed costs, and variable costs which are further divided between medicines and other items. This distribution was made based on the characteristics of each of the line items which make up the costs for each service. It is worth noting that, as is the case of many facilities which do not utilize a lot of high diagnostic and treatment technology, most of the costs, other than medicines, are relatively unaffected by volume. As one member of the staff noted, "This is a specialty referral institution because it has trained specialists, not because it has high technology." This means that unit costs will be very sensitive to reductions in the overall volume of services since total costs will change little.

Table 11 also presents the volumes of production which generated the above costs in 1990. These data are used to convert total costs to unit costs. The capacity figures refer to the total number of days available throughout the year and are calculated by multiplying the number of assigned beds for the service by the number of days in the year. These numbers represent the arithmetic upper limit of use of each type of service. In actual fact, current levels of use are high in the general ward, over 80%. Since there is inevitably some day-to-day variation, significantly higher levels of use would probably require additional fixed costs well before the 100% level. The private ward of 13 beds is generally underutilized, although it is potentially usable for other areas of non-septic service. In the case of outpatient visits and the surgical/delivery room, there are no capacity estimates.

The results of the unit cost calculations are presented in the lower section of the table. Unit costs without permanent personnel for the wards vary from 13.45 Bs. for nonsurgical general patients to 47.23 Bs. for patients in the private ward. The unit cost for use of the surgical/delivery suite was 53.94 Bs., and the unit cost of an outpatient visit was 9.09 Bs. The major components of unit cost for all categories are medicines and permanent personnel. For the patient wards, medicine is the major cost component, particularly for surgical patients. For the newborns and the surgical/delivery suite, personnel costs are more significant. The private ward unit costs are high due to low use even though they do not represent a major share of the hospital's capacity. These estimates of unit costs provide the basis for estimating the costs of treatment for each of the major diagnostic categories.

B. Major Diagnostic Categories

In 1990, almost half of the patients in HGU were admitted for normal deliveries. This diagnostic category, together with cesarians and abortions, accounted for 88% of all discharges. The three next most frequent causes for admission--feminine genito-urinary illnesses (mostly urinary tract infections), malignant tumors, and benign tumors--account for another 8%, with the rest of the admissions widely distributed with only a few in each diagnostic category. The major characteristics of these patient experiences are presented in Table 12.

From the initial analysis presented in Table 4, it was clear that there were a wide range of clinical conditions incorporated in the categories of cesarians and abortions. Under normal conditions, neither of these diagnoses would demonstrate such a wide distribution of length of stay. Discussions with the medical staff indicated that the major stay differences were related to the existence of complications, which were almost always infections that necessitated a longer course of treatment and, important for this study, treatment in a different ward. To incorporate this reality into the analysis, both cesarians and abortions were divided into complicated (with infection) and noncomplicated cases. The distinction was made based on the lengths of stay. For cesarians, all stays of 7 or fewer days were treated as noncomplicated while all stays of 8 or more days were considered complicated. For abortions, the cutoff point for complicated cases was 6 or more days, with all patients having a shorter stay treated as noncomplicated. As a result, the ALOS for uncomplicated cesarians was 5.21 days and for complicated cesarians, 14.27 days. For abortions, the ALOS were 2.16 days and 12.51 days respectively.

Most of the production of the hospital is incorporated in these eight diagnostic categories. However, each of them represents a different intensity of use of hospital services. While normal deliveries were almost one-half of the patients, they utilized less than one-quarter of the days of care. Complicated cesarians, on the other hand, were only 6% of the cases but used 17% of the days. Complicated cases were only 20% of all abortions but they utilized over 60% of the days provided to abortion patients. For cesarians, the 25% of cesarian cases assigned to the "complicated" category used almost half of the cesarian days. While the "other" category (consisting of all cases not included in the eight diagnoses) represented less than 7% of the cases, it utilized more than 14% of the hospital days. Changes in the mix of diagnoses will therefore result in changes in the ways that hospital resources are used.

C. Unit Costs of Treatments

The estimates of the unit costs per diagnosis are presented in Table 13. For each diagnosis, the table describes the quantity of each service used on average in 1990. With the exception of uncomplicated cesarians, each diagnosis received only one type of ward service. As noted earlier, complicated cesarians and abortions were assumed to be treated in the septic ward and normal deliveries, uncomplicated abortions, and female genito-urinary illnesses in the general ward. Tumors were assumed to receive treatment in surgical beds in the general ward.

For uncomplicated cesarians, it was clear that some were treated in surgical beds while others were treated in nonsurgical beds. Only 2,726 days of care were provided in surgical beds in 1990, 945 of which were utilized by the tumor patients. This left only 1781 days for all other patients. Uncomplicated cesarians used 2680 days of care, far more than would be available. If all of the available days for surgery patients were used by cesarian patients, it still would have been necessary to provide one-third of all uncomplicated cesarian days in nonsurgical beds. In fact, there were other surgical cases in the hospital during the year. As a result, the days of care for noncomplicated cesarians were divided equally between surgical and nonsurgical beds. This distribution allocates almost half of all of the surgical days to uncomplicated cesarian patients. Another 35% were utilized by the tumor patients. Together, these three diagnoses account for all but 441 days of care in the surgical ward. This amount of unaccounted for capacity represents less than 20% of the days utilized by patients in the "other" category which would be assumed to include some surgical cases.

These quantities of service use, together with the unit costs per service presented in Table 11, are used to derive the unit cost per diagnosis (less the costs of permanent personnel). As an example, normal deliveries utilized one unit of the delivery room and 2.58 days in the nonsurgical general ward. Since the

full cost of the delivery room was 53.94 Bs. and the cost per day for the general ward was 13.45, the total cost for the average normal delivery was 88.64 Bs. Without including the cost of drugs, the average cost for a normal delivery was 36.02 Bs. This same procedure was followed for all eight of the selected diagnoses.

When organized in this form, the significance of drug costs in the overall costs of treatment (less permanent personnel) is more evident. Drug costs are almost 60% of the costs (not including permanent personnel costs) of a normal delivery or an uncomplicated abortion, over 73% of the costs of an uncomplicated cesarian, and over 93% of the average cost of treatment for malignant tumors. In general, the more complicated the treatment, the higher is the proportion of drug costs to total costs. The trends noted earlier toward increasing complexity will place a premium on the effective management of drug costs and utilization, already the most closely managed component of the hospital's system of accounting and control.

Overall, considerable differences exist in the costs of treatment among the different diagnoses. Yet this range is widened considerably by the differences in drug costs. Without including drugs, the most expensive diagnosis cost 2.63 times the least expensive. When drugs were included in the analysis, the most expensive diagnosis cost 6.38 times the least expensive. It should be emphasized once again that these estimates do not include the cost of permanent personnel since these costs are not currently included in the cost-recovery targets for the institution. The next section relates the costs incurred by the hospital to its experience in cost-recovery.

V. HOSPITAL REVENUES AND COST RECOVERY

A. Revenues

1. Institutional Revenues

The earlier review of patient records indicated that the hospital has received user fees for services for many years. Although it was not possible to obtain fee schedules prior to 1987, patient records as early as 1972 indicated some patient payments. In 1987, as part of a "privatization" effort, the MPSSP initiated a local cost financing program which called for the establishment of fees at all of the facilities which they operated. Under this program, the MPSSP continues to pay the costs of permanent personnel and capital expenditures, with the support for other recurrent operating costs to be recovered from patient fees. This initiative placed a renewed emphasis on patient payments as a source of revenue and provided a stimulus for the present study.

Revenues are generated by the hospitals primarily from the sale of services and products (mostly medicines). In 1990, HGU generated revenues of over 700,000 Bs., of which 48% were from the sale of medicines (see Figure 6). Table 14 and Figure 7 present the revenues of HGU for the years 1988, 1989, and 1990. The changes in the mix of revenue sources over the period reflects the earlier-noted changes in the mix of services, with some decline in revenues from maternity services and a considerable increase in revenues from the sale of medicines. Significant revenues were also generated from the sale of services, in particular, payments for the use of the delivery room and the surgical suite. Together, these sources accounted for 21.2% of total revenues in 1990, down from 24% in 1989 and almost 25% in 1988.

The hospital in Quillacollo also generates revenues from the sale of services. Revenues for 1989 and 1990 are presented in Table 15.⁵ Most revenues come from payments for deliveries and outpatient services. Both of these categories showed considerable increase from 1989 to 1990, reflecting the overall increase in deliveries and outpatient services. Many of the categories of revenues reflect reimbursement for payments made by the hospital on behalf of patients. The HQ does not provide medicines or lab and x-ray services. Drugs are purchased by the patients through commercial outlets. Lab and x-ray services are provided locally, paid for by the hospital, and then charged to the patient. Ambulance fees also reflect charges for payments made by the hospital to transport patients to other facilities for medical services.

2. Revenues for Diagnoses

The above data relate to hospital revenues from all patients. By analyzing copies of patients receipts for payment, it was possible to document patient payments for specific diagnostic categories. Table 16 and Figure 8 present the annual average payments by patients for normal deliveries and cesarians from 1985 through 1990. These averages may be slightly overstated because they do not include patients who paid nothing since no records were maintained in the billings office for these cases.

Average payments for both services increased annually during the period. In general, patients paid 10 to 12 times as much in 1990 as in 1985. Much of the increase occurred between 1985 and 1986, a time of significant inflation and economic stress in Bolivia. During that single year, patient payments increased from 460% to 564%. Increases over the next 4 years ranged from 192% to 260%. When these data are adjusted for increases in the consumer price index, little change in the "real" value of user payments is observed for the 1986-1990 period. However, even in "real" terms, patient payments approximately doubled from 1985 to 1986.

Table 17 and Figure 9 present the above data in a more disaggregated form for the period 1985-1989. Although the trend of steadily increased payments is still evident, there is considerable fluctuation in the level of average payment from period to period. The experience in 1987 is worth noting since the current fee schedule was instituted between the February observations and the July observations. The initiation of the new higher fee schedule was followed by an higher rate of patient payment which, after a few months, returned to the trend patterns which characterized the earlier period.

The use of monthly averages tends to obscure the fact that, within each diagnostic category, there is a wide range of payment. Table 18 presents the distribution of payments in 1990 for a sample of patients for each of the three major diagnostic categories. Payments for normal deliveries are the most narrowly distributed, with 65% of the patients paying between 91 Bs. and 110 Bs. without drugs and almost 90% paying less than 130 Bs. For total payments, almost 75% paid between 121 Bs. and 160 Bs., with only 8% paying more than 200 Bs. For abortions, the average payments were similar to normal deliveries but with a much less concentrated distribution. Only 48% of the patients paid between 91 Bs. and 110 Bs., and 29% of the patients paid more than 200 Bs. Payments for cesarians were distributed over a much wider range, with the average payment over twice the average payment for a normal delivery.

⁵ Data on revenues for earlier periods were only available for selected months, making it difficult to estimate total year revenues. For this reason, no earlier data are presented. However, the records indicate that patient payments were being collected in early 1986, well before the 1987 fee schedules were adopted.

For cesarian patients, average payments for drugs were almost 55% of total payments. For normal deliveries and abortions the drug shares of total payments were 30% and 35% respectively. In general, total payments were distributed over a much wider range than payments without drugs, indicating that drug payments alone varied more widely than other payments. This may also reflect the fact that when partial payments are made, the hospital tends to adjust payments for services more than payments for products which it needs to replace. As a result, drug charges are more likely to be paid in full, increasing their relative share of total patient payments.

B. Cost-Recovery Experience

1. Revenue-Price Relationships

One important dimension of cost-recovery in public facilities is the ability to modify the economic barriers to care, usually through some type of waiver system where adjustments to charges are made for patients who cannot pay. As noted earlier, the analysis of patient charges indicates that HGU routinely evaluates a patient's ability to pay and modifies its charges accordingly. In particular, room charges are graded on a sliding scale, determined at the time of admission.

Since room charges are typically not the major portion of the patient's bill, additional adjustments are often made on an individual basis. Table 18 provides some indication of the range of adjustment. A normal delivery with no complications typically incurred charges of between 130 Bs. and 150 Bs. Almost 25% of the patients in 1990 paid less than this amount. Charges without drugs would typically be 100 Bs., yet 12% of the patients paid less than 90 Bs. For cesarians, the average stay of 5.21 days for a noncomplicated case would cost over 125 Bs. without drugs. However, over half of the patients paid less than this amount. These data indicate the effective operation of an extensive system of waivers.

For some types of services, it is possible to establish a direct relationship between revenues and prices to determine the proportion of exemption granted to the standard prices. In both hospitals, there is a standard charge for the use of outpatient services; 6 Bs. in HGU and 3 Bs. in HQ. Revenues from outpatient visits are accounted for separately from other revenues. Since the number of outpatient visits are also recorded, it is possible to determine the average revenue per outpatient visit and compare it to the "official" price. A similar analysis can be made, as well, for maternity services, which also have a standard price (60 Bs.) and separately recorded revenues. The results of these analyses are presented in Tables 19 through 21.

Table 19 presents the data for HGU. The number of outpatient visits increased from 3,958 in 1987 to 5,382 in 1990. Average revenues over the four year period ranged from 5.24 Bs. to 5.67 Bs., while the "official" price was 6.00 Bs. As a result, price-recovery percentages ranged from 87.38% to 94.44%. For maternity services, the volume of deliveries declined over the period, with a range of average revenues ranging from 41.29 Bs. to 51.12 Bs. compared to an "official" price of 60 Bs. Price-recovery percentages over the period ranged from 68.81% to 85.19%, lower than that for outpatient services.

A similar experience is found for the HQ, although in every case the price-recovery percentages are lower (see Tables 20 and 21). For HQ, data are based on full year experiences for 1989 and 1990 and averages over a sample of months for which data were available in 1986 and 1988. For outpatient visits, average revenues ranged from 0.98 Bs. to 1.97 Bs., yielding price-recovery percentages between 39.4% and 65.7%. For maternity services, the experience is similar, with price-recovery percentages ranging

between 33.6% and 68.2% for the four study years. These results indicate that HQ also has developed a vehicle for adjusting charges to the economic realities of its patient population. As a public district hospital in a growing periurban area, it would be expected to serve as an important facility for the poorest in the population. The relatively low price-recovery percentages indicate that it is playing that role.

2. Revenue-Cost Relationships

The above analysis of revenue-price relationships provides an indicator of the degree to which the institutions are responding to the diverse economic conditions that characterize the populations that they serve. It does not provide, however, a basis for assessing the degree to which revenues are sufficient to support the institution's resource requirements. This requires linking revenues to the costs of production.

The revenue-cost relationships can be assessed on two levels, each of which provides a different perspective on the institution's economic performance. For the institution as a whole, economic viability requires that total revenues be sufficient to cover total costs, regardless of the degree to which the costs of producing an individual service are covered by the revenues generated from payments for that particular service. Yet, understanding the cost-recovery experience for individual services provides a basis for assessing the potential economic implications of changes in output mix and pricing policies. Both of these aspects of cost-recovery are examined for HGU.

For the institution as a whole, the cost-recovery experience of the past three years has been positive. Table 22 presents the consolidated revenue-cost data for both maternity and pediatrics for the years 1988-1990. Overall, the hospital has come quite close to its goal of recovering all of its recurrent costs (excluding permanent personnel costs), achieving over 98% of the target in 1989 and 1990. A large factor in this achievement has been the steadily increasing cost-recovery for pharmaceuticals, over 103% in 1990.

When the maternity component of the hospital is considered separately, the cost-recovery experience is quite different. Table 23 presents the cost-recovery data for 1990 in disaggregated form. While the maternity portion of the HGU represented less than 60% of costs, it accounted for more than 78% of the consolidated revenues. Maternity recovered over 200% of its non-pharmaceutical costs while pediatrics recovered slightly more than one-third. While pediatrics recovered over 200% of their drug costs, those costs represented only slightly more than 10% of all drug costs for the consolidated institution. Overall, maternity recovered almost 30% more than their total costs, while pediatrics recovered slightly more than half. As a result, revenues from maternity patients were available to subsidize the operations of the pediatrics facility.

The economic basis for the generation of revenues from maternity services is made clearer when the average payments for individual diagnoses are compared to the estimates of unit costs. The results of this analysis are presented in Table 24. In 1990, average revenues for each of the three major diagnostic categories were considerably higher than their unit costs of production (excluding permanent personnel). Each normal delivery, for example, cost 63 Bs. less than the average patient payment. For cesarians, the difference was 108 Bs., while for abortions it was 51 Bs. This means that, given the current structure of costs and revenues, the services that accounted for almost 85% of all patients generated more revenue than they cost to produce. This "excess" revenue was available to support other services for which costs were higher than revenues. For the hospital as a whole (maternity and pediatrics), this cross-subsidy was sufficient to enable the institution to meet its cost-recovery targets.

C. Cross-Subsidies and the Impact of Market Changes

The existence of potential cross-subsidies is an essential component of a successful cost-recovery strategy. In general, the institutional setting within which revenues are shared needs to produce a mix of services which, on average, generate sufficient revenues to cover their costs. For any individual service, however, this condition may not be achievable.

In the world of simple economics, the inability of a service (or good) to command a price sufficient to cover costs is seen as an indication that the service should not be produced. In the current setting, a central referral hospital in a system of maternal and neonatal health services, such a conclusion would be inappropriate. The mix of services in the referral institution is determined both by user demand and the need to have specialized services available to the system as a whole. The value of these services is only partly reflected in the utilization. In addition, the ability to have the services available is of value to all potential users of the system, regardless of their specific use of the specialized services.

1. Cross-Subsidies within Maternity

The experience of HGU demonstrates the essential nature of the cross-subsidy in the economic operations of the hospital. Table 25 presents the amount of net revenue generated by each use of the most frequently utilized maternity services. These estimates are based on the assumption that the average revenues are those experienced in 1990. As noted earlier, the major inpatient maternity services all generate positive subsidies to the institution. In the case of outpatient services, each use required a subsidy of 3.85 Bs. from other revenues in the hospital. For 1990, the subsidy for outpatient services amounted to 20,720.70 Bs. This is the amount of net revenue generated by 329 normal deliveries, almost 22% of the total normal deliveries for the year.

Other cross-subsidies may occur within given diagnostic categories. In a population such as that served by HGU, the more complicated cases with higher charges will often pay a smaller proportion of those charges. If complicated cases generated the same revenue on average as uncomplicated cases, a complicated cesarian would require a subsidy of 6 Bs. while a complicated abortion would require a subsidy of 118 Bs.

Recognition of the cross-subsidy within diagnostic categories provides a basis for exploring some of the potential economic implications of a changing mix of services. As the mix of cases within a diagnosis becomes more complicated, the average costs of production will rise. If revenues do not rise as well, the ability to generate subsidies for other services will be reduced and, in some cases, subsidies will be required for a previously net revenue generating service. As an example, the current mix of cesarians generates a positive revenue of 108 Bs. per case. If the mix of uncomplicated cases to complicated cases were 50/50 instead of the actual 75/25, the average revenues generated would be 69 Bs. per case. If all of the cases were complicated, each case would require a subsidy of 6 Bs. For abortions, changes in the mix have even greater economic impact. Moving from the current ratio of 80/20 to a ratio of 50/50 would result in a required subsidy from other revenues of 11 Bs. per case. If all of the abortions were complicated, the required subsidy would be 118 Bs. per case.

At last year's volume of production, producing only complicated cases would have required a total subsidy of 44,722 Bs. for abortions and a subsidy of 4,422 Bs. for cesarians. This amount represents more than half of all net revenues generated by payments for normal deliveries. While these circumstances are hypothetical, the trend toward increasing complexity of services, even when appropriate for the institution,

inevitably creates additional pressures on the ability of the institution to meet its economic and financial targets.

2. Cross-Subsidies within the Hospital

The ability of the maternity service to respond to the above changes in diagnostic mix and case-severity by transferring revenues is made even more difficult by the dependence of the total institution on revenues generated from maternity services. In 1990, the maternity service generated net revenues of 161,780 Bs., almost 43% of the total costs of operation for the pediatrics service. The costs of the pediatrics service exceeded the revenues generated by 179,481 Bs. requiring a subsidy from maternity services of almost 50% of its total costs of operation. When costs of and revenues from pharmaceuticals are ignored, maternity revenues were used to support two-thirds of the costs of operation of the pediatrics service.

No analysis of the opportunities for increased revenue generation for pediatrics services has been made as part of this study. However, the large difference in current revenue generation experience suggests that the possibility of net transfers from pediatrics to maternity is not likely to provide a solution to the economic and financial pressures generated by the noted changes in the market for maternity services in the region. More likely, the reduction in the ability of the maternity service to generate revenues for pediatrics services will create additional economic pressures on those services.

3. System-wide Cross-Subsidy

The ability to generate cross-subsidies in a system which depends on cost-recovery for a significant part of its operating costs is an important dimension of its economic and financial viability. Having a mix of both revenue generating and subsidy requiring services within a single financial structure permits balancing product mix against financial requirements. The experience of HGU provides a good example of how that can work. To date, the proportion of more costly and complicated services has been small enough to ensure that the hospital will be able to generate needed revenues from the product mix of the institution. Within maternity services alone, the proportion of services requiring subsidies has been relatively small, enabling the service to generate excess revenues which have been used to support the pediatrics services. Many factors in the Cochabamba market for maternity services may be working to limit that ability.

The evident growth in the number of physicians providing maternity services suggests increased competition, particularly for the less risky patients and those most likely to be able to pay for services. This competition is probably reflected in the declining numbers of normal deliveries at HGU. This loss of market share might be made up for by an overall growth in the use of medically assisted maternity services but, more likely, such growth will be reflected in a change in the mix of services in HGU, with the hospital providing a greater share of more complicated referral services and a higher proportion of patients unable to pay for services.

If a result of these changes is a reduction in total production, unit costs for all procedures will rise, reducing the net revenues generated or increasing the subsidy requirements. This outcome reflects the relatively high proportion of fixed costs in the total costs of the institution. Alternatively, and more likely, the volume of production might remain unchanged or, perhaps,

increase as a result of the general increase in both the supply of and demand for medically assisted maternity services. In this case, more costly and complicated procedures will be substituted for the less complicated (and often more revenue generating) cases lost to the competition. This shift in product mix toward greater complexity and specialization, while an appropriate role for the referral hospital in a growing system, will nevertheless place additional economic and financial pressures on HGU and, as well, on the pediatrics services now economically dependent on the subsidies generated from maternity services.

All of the changes noted above serve to limit the potential for cross-subsidization within the referral institution. To sustain the economic viability of the HGU under the above conditions, cross-subsidy opportunities need to be broadened to the system level. What are needed are strategies for utilizing some of the net revenues generated by other providers in the system to support the continued access to specialized referral services when they are appropriate. This requires establishing a fiscal relationship among the providers in the system within which such cross-subsidization can take place. A number of different types of strategies can be considered.

One alternative is public sector provision with tax revenues being used to provide the fiscal link between the general public and the support of specialized referral services. In fact, the weak economic condition of the public sector has generated movement away from this position. The increasing dependency on cost-recovery as a source of revenue for publicly supported maternity services represents a shift away from public financing toward user financing and reduces the potential for system-wide cross-subsidization.

Another alternative is the vertical integration of services with a wider range of services available within a single fiscal structure. This option is severely limited by the rapid growth of low cost suppliers in the Cochabamba region which dilutes the market share of any single primary producer. The lack of investment capital and the high degree of competition for the most "profitable" patients makes it difficult to capture enough of the primary market to provide adequate cross-subsidy opportunities.

A preferred option is to develop the fiscal structures within which cross-subsidization (risk-sharing) can take place through the use of insurance mechanisms. Insurance has the capacity to integrate some of the financial dimensions of the system without necessarily affecting the existing organization and structure of the system, thereby enabling both public and private providers to participate in the same insurance structure. Some recommendations for developing an insurance strategy which can pool resources generated from frequently occurring revenue generating services and use these resources to subsidize essential referral services are presented below.

VI. FINANCING STRATEGIES TO SUPPORT IMPROVED MATERNAL AND NEONATAL SERVICES

The objective of the MotherCare project activities in Cochabamba is to develop initiatives which can improve the quality and utilization of appropriate maternal and neonatal services. The objective of this study is to identify the economic and financial conditions which affect the ability of the system to meet this objective. Based on the preceding analysis, this section suggests a number of financing strategies which might support improved services by creating incentives for more appropriate use and improved quality of supply and by strengthening the fiscal base for effective referral to and utilization of specialized maternity services.

A. Hospital Strategies

A fundamental need is the development of pricing strategies which will encourage more appropriate use of services. In particular, the low use of prenatal services has been identified by the hospital staff as a major constraint on the quality of care. Two general strategies can be suggested, each of which incorporates incentives for more timely use of prenatal care as a component of the delivery process.

While the HGU does not have a fixed price for a delivery, most of the patients receive similar charges approximating 150 Bs. The hospital should consider offering, for a fixed price, a set number of prenatal visits (3 or 4) and the delivery as a single package. At the 1990 unit costs, a package of 4 prenatal visits and a normal delivery would cost less than 125 Bs., well under the average patient payment for the delivery alone. Alternative packages might make the price lower if the initial prenatal visit is prior to the third trimester or might include, as well, all immunizations for the child through the first year. In general, these packages should be priced in such a way that better patient use of services is associated with a lower price.

An alternative to packaging services is the use of a rebate, or credit, system. Under such a system, each use of prenatal services gives the patient a credit against the cost of delivery. As an example, prenatal visits before the third trimester might include a 20 Bs. reduction in the price of delivery at the HGU. Visits in the third trimester might include a 10 Bs. credit with a total up to a limit of 40 Bs. or 50 Bs. Women meeting the hospital's target of 4 prenatal visits per delivery would pay on average 100 Bs. to 110 Bs., a price very competitive with the private providers. Such a system is similar to a sliding scale where the prices charged are lower if the patient makes better use of available services. In this case, more and earlier use means better quality and lower price to the patient.

It needs to be emphasized that each of these strategies provides incentives for more effective use of maternity services. At the same time, however, each package incorporates some cross-subsidization from normal deliveries to outpatient visits. Increased use of prenatal services will reduce the net revenues available for other cross-subsidies within maternity and within the hospital as a whole. Increased prenatal visits prior to delivery would be expected to improve

pregnancy outcomes. It may also reduce the costs of some deliveries, but the high percentage of fixed costs in HGU makes this effect likely to be too small to offset the other increased costs.

B. System Strategies

For the system as a whole, the possibility of cross-subsidy is limited by the diversity of settings and the absence of direct financial linkages among them. However, the need for new financing strategies that can facilitate this process is clear. The increasing financial pressures on HGU reflect changes in the service delivery system which are positive. The increased use of medical attention for delivery can improve maternity outcomes if the quality of services provided by the expanding physician pool is appropriate. Similarly, in a growing system of services, it is desirable that the relative complexity of services will increase in the referral institutions as a wider range of alternatives (particularly less costly alternatives) become available to pregnant women. A financing strategy needs to encourage these changes while also assuring the financial sustainability of the system.

The problem is not simply a financial one. The current system, with its expanding provider pool and active competition for patients, tends to discourage the appropriate use of referral services and raise the likelihood that patients referred to HGU will be less able to pay for services.

1. For physicians, referral often means loss of income and, perhaps, loss of the patient for subsequent deliveries.
2. For the patient, referral often means additional unanticipated payments.
3. For HGU, referred patients will arrive sicker and, having already spent their delivery payment money, less able to pay for services.

What is needed is a financing strategy which creates incentives for appropriate referral by eliminating the financial disincentives for referral while, at the same time, creating linkages among the initial providers and the referral institution(s) which assure the timeliness and appropriateness of referrals.

One financing strategy which can incorporate these characteristics is a financing pool, or insurance fund, to support referral services for deliveries. The fund can be established as an independent non-profit insurance-type organization specifically directed at insuring referral services for maternity care. Participation in the fund would be limited to primary providers who agree to the following:

1. Participate in periodic training supported by the fund (to assure the quality of provider services).

2. Pay a premium on behalf of all of their maternity patients (to avoid adverse risk selection).
3. Participate in a system-wide quality assurance program managed by the fund.

Providers who meet these criteria would become certified participants in the fund and have the right to refer patients to the referral institution (HGU) when certain medical conditions are present without financial loss and without further charges to the patient for any needed services. The initial patient payment would be the only patient payment for the delivery. The initial provider would receive the regular fee and the hospital would be paid its charges by the insurance fund.

This type of fund creates both clinical and financial linkages between the initial provider and the referral institution. These linkages provide a basis for modification of the existing disincentives for appropriate referral. On the quality side, the linkage of participation in the fund to training and quality assurance provides a vehicle for improving providers' skills. In the highly competitive and growing Cochabamba market for maternity services, the desire to gain an additional "edge" provides a stimulus to participation. Designated fund participants can offer patients both financial certainty and evidence of quality, reinforced by the fund's advertising and consumer education efforts. To protect the provider's interest in the patient, the physician would be entitled to visit the patient in the hospital and could participate as appropriate in follow-up care.

By associating participation in the fund with both quality of services and financial security, consumers are encouraged to make better judgments in selecting initial providers. Fund outreach and marketing is used to enhance user awareness of qualitative differences among providers and to encourage use of the "best" providers (e.g. participating providers). On the financial side, the confidence that HGU services will be available and paid for if they are needed by the patient provides additional encouragement for the use of participating providers.

The feasibility of creating an insurance fund for maternity referrals will need to be established based on further analyses. Yet some of the general properties are clear. The fund itself would be an independent nonprofit legal entity conforming to the financial requirements for insurance companies. It would carry out the training and quality assurance activities, using the resources of HGU, the referral institution. Participating providers could come from both the private and the public sectors such as individual physicians, voluntary organizations, public clinics, or any other unit providing maternity services that meets some set acceptable clinical criteria related to training, licensure, and legal status. The acceptance of training and quality assurance oversight and the payment of the premium for all maternity patients are the fundamental commitments for participation and would apply to all providers in the fund. Periodic renewal based on additional training and the compliance with quality norms provides a continuous incentive for maintenance of standards.

The fund would market its coverage by linking the identification of participating providers with assurance of both quality of care and referral hospital back-up. While participating providers' fees would need to include the fund premiums, competitive pressure will continue to serve to limit price increases for most providers. This type of financing strategy has the important characteristic of supporting the ongoing general efforts to raise the quality of maternal services in the Cochabamba region. The strategy creates financial incentives for improvement in quality and appropriate referral and can generate sufficient funds to assure the economic and financial sustainability of the referral services of HGU.

C. Final comments

The suggested financing strategies have two objectives: strengthening the financial base for essential maternity services and creating incentives for producers and consumers to utilize maternity services in an appropriate manner. No financing strategy can accomplish these goals by itself. Rather, it is essential to design financing strategies which support rather than conflict with these objectives. This study of maternity services in the Cochabamba region has demonstrated a rapidly growing market and a changing pattern of utilization of services. The financing strategies recommended for consideration accept that reality and attempt to create within the setting instruments which can support both improved quality and financial sustainability. Together with the overall MotherCare initiatives, improved health care financing can play an important role in achieving this goal.

TABLE 1

Hospital German Urquidi
Discharges
1985-1990

	Total	Normal Deliveries	Cesarians	Abortion Complic.	Others	Occupancy Rate
1985	3,996	2,532	546	611	307	45.58%
1986	3,698	2,256	550	467	425	50.73%
1987	3,955	2,376	618	508	453	55.91%
1988	3,517	2,013	657	466	381	65.29%
1989	3,307	1,771	679	412	445	65.15%
1990	3,005	1,515	737	379	374	65.81%

Percentage Distribution

	Total	Normal Deliveries	Cesarians	Abortion Complic.	Others
1985	100.00%	63.36%	13.66%	15.29%	7.68%
1986	100.00%	61.01%	14.87%	12.63%	11.49%
1987	100.00%	60.08%	15.63%	12.84%	11.45%
1988	100.00%	57.24%	18.68%	13.25%	10.83%
1989	100.00%	53.55%	20.53%	12.46%	13.46%
1990	100.00%	50.42%	24.53%	12.61%	12.45%

TABLE 2

Utilization of Services
 German Urquidi Maternity Hospital
 1985-1990

	1985	1986	1987	1988	1989	1990
Patient Days	9,901	12,478	15,731	16,356	16,231	15,452
Discharges	3,996	3,698	3,955	3,517	3,307	3,005
Average Length of Stay (ALOS)	2.48	3.37	3.98	4.65	4.91	5.14

TABLE 3

Hospital German Urquidi
 Length of Stay by Diagnosis
 Selected Services
 1990

	Normal Deliveries (650)	Cesarians (659)	Abortion Complic. (630-639)	Diseases of the Female Gen-Urin. Organs (610-629)	Malignant Tumors of the Genito- urinary Organs (179-189)	Benign Tumors (210-229)
Number of Observations	119 a/	118 a/	343 a/	162	41	50
Total Patient Days	307	827	1,478	1,687	574	371
Average Length of Stay	2.58	7.01	4.31	10.41	14.00	7.42

a/ Sample of cases--other diagnoses include all cases in 1990.

TABLE 4

Distribution of Lengths of Stay
Hospital German Urquidi, 1990

Days	Normal Deliveries		Cesarians		Abort. Complic.		Gen-U. Diseases		Malignant Tumors		Benign Tumors	
	No. of Observ.	%	No. of Observ.	%	No. of Observ.	%						
1	12	10.17%	0	0.00%	111	94.07%	31	26.27%	3	2.54%	5	4.24%
2	62	52.54%	3	2.54%	76	64.41%	18	15.25%	4	3.39%	5	4.24%
3	24	20.34%	1	0.85%	35	29.66%	15	12.71%	5	4.24%	7	5.93%
4	9	7.63%	17	14.41%	29	24.58%	4	3.39%	2	1.69%	2	1.69%
5	8	6.78%	32	27.12%	21	17.80%	11	9.32%	2	1.69%	5	4.24%
6	0	0.00%	27	22.88%	6	5.08%	10	8.47%	2	1.69%	4	3.39%
7	2	1.69%	10	8.47%	14	11.86%	11	9.32%	3	2.54%	4	3.39%
8	0	0.00%	5	4.24%	6	5.08%	12	10.17%	0	0.00%	3	2.54%
9	1	0.85%	2	1.69%	12	10.17%	5	4.24%	1	0.85%	1	0.85%
10	1	0.85%	3	2.54%	4	3.39%	6	5.08%	1	0.85%	2	1.69%
11	0	0.00%	4	3.39%	5	4.24%	4	3.39%	0	0.00%	1	0.85%
12	0	0.00%	4	3.39%	1	0.85%	0	0.00%	0	0.00%	0	0.00%
13	0	0.00%	1	0.85%	1	0.85%	3	2.54%	2	1.69%	0	0.00%
14	0	0.00%	2	1.69%	3	2.54%	2	1.69%	3	2.54%	4	3.39%
15	0	0.00%	0	0.00%	2	1.69%	2	1.69%	0	0.00%	1	0.85%
16	0	0.00%	3	2.54%	4	3.39%	2	1.69%	1	0.85%	0	0.00%
>16	0	0.00%	4	3.39%	13	11.02%	26	22.03%	12	10.17%	6	5.08%
n =	119	100.85%	118	100.00%	343	290.68%	162	137.29%	41	34.75%	50	42.37%

TABLE 5

Hospital Quillacollo
 Mix of Services, 1985-1990
 Annual Summary

Year	Normal Deliveries	Cesarians	Abortion Complic.	Others	Total
1985	275	0	29	489	793
1986	302	2	15	414	733
1987	382	4	32	412	830
1988	395	12	30	315	752
1989	354	21	16	302	693
1990	422	33	27	327	809

Percentage Distribution

Year	Normal Deliveries	Cesarians	Abortion Complic.	Others	Total
1985	34.7%	0.0%	3.7%	61.7%	100%
1986	41.2%	0.3%	2.0%	56.5%	100%
1987	46.0%	0.5%	3.9%	49.6%	100%
1988	52.5%	1.6%	4.0%	41.9%	100%
1989	51.1%	3.0%	2.3%	43.6%	100%
1990	52.2%	4.1%	3.3%	40.4%	100%

TABLE 6

Hospital Quillacollo
Average Length of Stay
1990.

	Normal	
	Deliveries	Cesarians
No. of Observations	120	35
Average Length of Stay	2.17	4.71

TABLE 7

Hospital German Urquidí
 Outpatient Visits
 1985-1990

	Total Outpatient Visits	Total Prenatal Visits	Prenatal Visits:		Prenatal Visits per New Visit	Other Outpatient Visits
			New Visits	Repeats		
1985	3,718	2,180	1,055	1,125	2.07	1,538
1986	3,741	2,101	1,030	1,071	2.04	1,640
1987	3,958	2,119	1,087	1,032	1.95	1,839
1988	4,193	2,088	999	1,089	2.09	2,105
1989	4,815	2,080	1,053	1,027	1.98	2,735
1990	5,382	2,068	1,098	970	1.88	3,314

Percentage Distribution

	Total Outpatient Visits	Total Prenatal Visits	Prenatal Visits:		Other Outpatient Visits
			New Visits	Repeats	Visits
1985	100.0%	58.6%	48.4%	51.6%	41.4%
1986	100.0%	56.2%	49.0%	51.0%	43.8%
1987	100.0%	53.5%	51.3%	48.7%	46.5%
1988	100.0%	49.8%	47.8%	52.2%	50.2%
1989	100.0%	43.2%	50.6%	49.4%	56.8%
1990	100.0%	38.4%	53.1%	46.9%	61.6%

TABLE 8

Hospital German Urquidi
Prenatal Visits per Delivery
1985-1990

	1985	1986	1987	1988	1989	1990
Deliveries						
Normal Deliveries	2,532	2,256	2,376	2,013	1,771	1,515
Cesarians	546	550	618	657	679	737
Total	3,078	2,806	2,994	2,670	2,450	2,252
Prenatal Visits						
New Visits	1,055	1,030	1,087	999	1,053	1,098
Return Visits	1,125	1,071	1,032	1,089	1,027	970
Total	2,180	2,101	2,119	2,088	2,080	2,068
Prenatal Visits per Delivery	0.71	0.75	0.71	0.78	0.85	0.92
New Prenatal Visits per Delivery	0.34	0.37	0.36	0.37	0.43	0.49

TABLE 9

Hospital Quillacollo
 Deliveries and Prenatal Visits
 1985-1990

	Normal Deliveries	Cesarians	Total Deliveries	Prenatal Visits	Prenatal Visits per Delivery
1985	275	0	275	232	0.84
1986	302	2	304	394	1.30
1987	382	4	386	420	1.09
1988	395	12	407	569	1.40
1989	354	21	375	469	1.25
1990	422	33	455	1,147	2.52

TABLE 10

Allocation of Costs to Cost Centers

	Out- Patients	General Ward	Septic Ward	Private Ward	Neonatal Unit	Surg Th/ Del Rm	Lab.	Pharm- acy	Food Service	Laundry	Ped- iatrics	Admini- stration	TOTAL
110 Permanent Employees	43,420	50,102	13,195	18,577	49,218	98,644	7,241	8,307	0	23,266	248,781	63,661	624,412
120 Nonpermanent Employees	0	10,283	6,669	0	2,223	2,223	598	2,223	0	0	32,539	21,983	78,741
211 Communications	0	0	0	0	0	0	0	0	0	0	0	215	215
212 Electricity and Water	0	0	0	0	0	0	0	0	0	0	0	29,471	29,471
213 Telephone Services	0	0	0	0	0	0	0	0	0	0	0	3,532	3,532
221 Transport	0	0	0	0	0	0	0	0	0	0	0	2,958	2,958
241 Buildings and Equipment	0	0	0	0	0	1,649	0	5,421	0	3,487	0	3,487	14,045
250 Professional Services	0	0	0	0	0	0	0	0	0	0	0	9,551	9,551
311 Food	0	9,111	3,719	2,789	2,417	4,276	0	1,859	2,603	3,347	0	2,138	32,259
330 Textiles and Clothing	0	0	0	0	0	24,789	0	0	0	0	0	0	24,789
341 Writing Paper	0	51	51	51	51	360	0	0	0	0	0	5,092	5,658
342 Graphic Art Products	0	4	0	0	0	5	0	4	0	0	0	22	35
343 Paper Products	0	0	0	0	0	8	0	0	0	0	0	10	18
346 Periodicals	0	0	0	0	0	0	0	0	0	0	0	336	336
354 Leather Products	0	0	0	0	0	0	0	0	0	0	0	604	604
362 Combustibles and Lubr.	0	3,433	0	1,194	597	149	0	0	0	0	0	0	5,374
365 Drugs & Pharmaceuticals	37,220	158,116	59,874	13,769	23,362	76,815	0	0	0	0	0	0	369,156
370 Products	0	0	0	0	0	0	0	0	0	0	0	7,231	7,231
391 Cleaning material	140	1,126	90	99	197	682	0	49	855	3,411	0	879	7,529
393 Cooking Utensils	0	0	0	0	0	0	0	0	144	0	0	0	144
394 Small Med/Surg Instr.	0	0	0	0	0	69	0	0	0	0	0	1	70
395 Office & Teaching Items	0	0	0	0	0	0	0	0	0	0	0	1,130	1,130
396 Other Materials	0	0	0	0	0	0	0	0	0	0	0	0	0
411 Buildings	0	0	0	0	0	0	0	0	0	0	0	3,160	3,160
431 Machinery	0	0	0	0	7,953	15,906	0	0	0	0	0	0	23,859

Allocation of Costs to Service Centers

Total Costs	80,780	232,227	83,598	36,480	86,019	225,575	7,839	17,864	3,602	33,511	281,320	155,463	1,244,277
Allocation													
Administration	10,931	15,202	5,001	4,677	12,951	25,394	1,974	2,651	0	5,857	70,825		155,463
Pediatrics	0	0	0	0	0	0	0	0	0	0	0		0
Laundry	5,706	28,409	3,828	1,426	0	0	0	0	0				39,369
Food Service	0	2,573	946	82	0	0	0	0					3,602
Pharmacy	4,188	5,422	5,148	2,848	2,909	0	0						20,515
Laboratory	4,627	4,258	0	927	0	0							9,813

Total Costs--Maternity and Pediatrics

With Permanent Personnel	106,232	288,092	98,521	46,441	101,878	250,969					352,145	a/	
Without Perm. Personnel	62,812	237,990	85,326	27,864	52,660	152,325					103,364		

Maternity

Fixed Costs													
With Perm. Personnel	68,872	119,687	34,787	29,732	75,851	144,039							472,968
Without Perm. Pers.	11,543	38,865	14,692	6,246	19,998	34,996							126,339
Variable Costs	37,360	168,404	63,734	16,708	26,027	106,930							419,165
Without Drugs	140	10,288	3,860	2,939	2,666	30,115							50,009
Drugs	37,220	158,116	59,874	13,769	23,362	76,815							369,156
												TOTAL	892,132

a/ Personnel and Administration costs only--other costs not included.

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TABLE 11

Summary of Costs: 1990

With Unit Costs

Aggregate Costs

	Out- Patients	General Ward			Septic Ward	Private Ward	Neonatal Unit	Surg Theater/ Del Rm
		Total	Surg.	Others				
Perm. Personnel Cost	57,329	80,823			20,095	23,487	55,853	109,043
Other Fixed Costs	11,543	38,865			14,692	6,246	19,998	34,996
Variable Costs								
Drugs	37,220		80,639	77,477	59,874	13,769	23,362	76,815
Others	140	10,288			3,860	2,939	2,666	30,115
Total w/o Perm. Pers.	48,903	207,269			78,426	22,954	46,025	141,926
Production								
Outpatients	5,382							
Patient Days		11,257	2,726	8,531	4,057	486	1,857	
Uses of Surg/Del Rm								2,631
Capacity		13,966	3,291	10,675	6,206	4,745		
Occupancy Rate		80.6%	82.8%	79.9%	65.4%	10.2%		

Unit Costs	Out- Patients	General Ward			Septic Ward	Private Ward	Neonatal Unit	Surg Theater/ Del Rm
		Total	Surg.	Others				
Costs w/o Perm. Pers.								
Fixed Costs	2.14	3.45			3.62	12.85	10.77	13.30
Variable Costs w/o Drugs	0.03	0.91			0.95	6.05	1.44	11.45
Total without Drugs	2.17	4.37			4.57	18.90	12.20	24.75
Drug Costs	6.92		29.58	9.08	14.76	28.33	12.58	29.20
Total With Drugs	9.09		33.95	13.45	19.33	47.23	24.78	53.94
Perm. Personnel Cost	10.65	7.18			4.95	48.33	30.08	41.45
Total Recurrent Cost	19.74		41.13	20.63	24.28	95.56	54.86	95.39

TABLE 12

Utilization by Diagnosis
Hospital German Urquidi, 1990

Diagnosis	Average Length of Stay	Cases		Length of Stay in days	
		No.	%	No.	%
Normal Delivery	2.58	1,475	49.1%	3,806	24.6%
Cesarian					
Not Complicated (75%)	5.21	553	18.4%	2,680	17.3%
0-7 days					
Complicated (25%)	14.27	184	6.1%	2,629	17.0%
8+ days					
Incomplete Abortion					
Not Complicated (80%)	2.16	272	9.1%	588	3.8%
0-5 days					
Complicated (20%)	12.51	71	2.4%	888	5.7%
6+ days					
Diseases of the Female Gen-Urin. Organs	10.41	162	5.4%	1,687	10.9%
Malignant Tumors	14.00	41	1.4%	574	3.7%
Benign Tumors	7.42	50	1.7%	371	2.4%
Other	11.31	197	6.6%	2,229	14.4%
Total	5.14	3,005	100.0%	15,452	100.0%

TABLE 13

Services and Costs by Diagnosis
Hospital German Urquidi, 1990

Diagnosis	Surg Th/ Del Rm/ Legrados	General Ward		Septic Ward	Unit Costs	
		Surg.	Non-Surg.		Total	W/o Drugs
Normal Delivery	1		2.58		88.64	36.02
Cesarian						
Not Complicated (75%)	1	2.60	2.61		177.31	47.52
0-7 days						
Complicated (25%)	1			14.27	329.78	89.96
8+ days						
Incomplete Abortion						
Not Complicated (80%)	1		2.16		82.99	34.19
0-5 days						
Complicated (20%)	1			12.51	295.76	81.92
6+ days						
Diseases of the Female Gen-Urin. Organs			10.41		140.01	45.49
Malignant Tumors	1	14.00			529.24	85.93
Benign Tumors	1	7.42			305.85	57.18

Unit Costs	Con Medic.	Sin Medic.
Surgical Theater/ Delivery Room/ "Legrado" (D&C) Room	53.94	24.75
General Ward		
Surgical Cases	33.95	4.37
Non-surgical Cases	13.45	4.37
Septic Ward	19.33	4.57

TABLE 14

Hospital German Urquidi
Revenues, 1988-1990

	1988	1989	1990
SALE OF SERVICES			
Certificates	40	133	624
Laboratory	8,295	12,238	13,403
Ultrasound	6,664	13,051	14,758
X-Ray	0	0	160
Injectables	0	0	0
Maternity	89,553	90,525	71,566
Surg. Theat. Usage	68,393	80,219	78,253
Hospitalization	84,833	91,458	63,748
Outpatients	22,171	27,285	28,216
Dental Service	5,106	4,079	2,269
Private Ward	100	260	8,780
Emergency	10,072	12,906	8,711
Doctor's Percentage	21,604	13,539	10,977
Incubator	3,393	3,573	7,722
SALE OF PRODUCTS			
Pharmaceutical Prod.	265,780	285,774	340,813
Oxygen	10,287	28,557	27,273
Other	20,692	0	0
OTROS INGRESOS			
Balance from			
Earlier Years	7,096	9,008	7,583
Repayment and			
Depreciation	1,971	20,812	6,747
Provision of			
Receipts	8,852	948	1,787
Other	0	9,306	13,896
GRAND TOTAL	634,902	707,239	707,284

Source: Resumen de Ingresos del Hospital
Maternidad German Urquidi; Estados Financieros
Gestion 1988 & 89, Ministerio de Prevision Social
y Salud Publica, Hospital Materno Infantil German
Urquidi, Cochabamba

TABLE 15

Hospital Quillacollo
Revenues, 1989-1990
(Bs.)

	1989	1990
Outpatients	5,501	8,479
Injectables	362	540
Treatment	1,684	2,544
Ambulance	100	135
X-Ray	2,942	2,410
Maternity	13,020	18,627
Hospitalization	4,908	8,334
Laboratory	245	206
TOTAL	28,762	41,275

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TABLE 16

Hospital German Urquidi
Average Maternity Payments, 1985 - 1990

With Drugs

Year	Current		Price Index	Constant	
	Normal	Cesarian		Normal	Cesarian
1985	14	26	100	14	26
1986	79	123	276	29	45
1987	102	182	317	32	57
1988	123	225	367	34	61
1989	146	287	423	34	68
1990	152	323	499	30	65

Without Drugs

Year	Current		Price Index	Constant	
	Normal	Cesarian		Normal	Cesarian
1985	9	13	100	9	13
1986	47	60	276	17	22
1987	72	98	317	23	31
1988	90	107	367	24	29
1989	105	143	423	25	34
1990	107	147	499	21	29

NB: 1985 and 1986 prices = * 1,000,000 Pesos Bs.
1987 - 1990 prices = * 1 Bs.

Price index from the National Statistics Institute.

TABLE 17

Hospital German Urquidi
Average Maternity Payments, 1985-1989

MONTH	YEAR	With Drugs		Without Drugs		
		NORMAL	CESARIAN	NORMAL	CESARIAN	
March	1985	2.1	2.6	1.4	2.0	(* 1,000,000)
May		5.4	6.0	3.4	4.2	(* 1,000,000)
July		9.5	22.0	6.0	9.8	(* 1,000,000)
November		37.0	71.5	24.0	35.8	(* 1,000,000)
January	1986	63.8	106.6	38.0	50.6	(* 1,000,000)
April		74.6	113.3	44.3	53.3	(* 1,000,000)
July		86.4	133.5	52.6	71.8	(* 1,000,000)
October		92.0	139.3	53.9	64.3	(* 1,000,000)
January	1987	77.4	146.5	56.4	81.5	(* 1,000,000)
February		73.6	95.5	54.3	63.0	(* 1)
July		115.8	136.5	86.4	97.8	(* 1)
October		136.9	246.3	95.3	119.5	(* 1)
December		107.5	282.8	69.6	130.0	(* 1)
March	1988	97.6	216.3	63.9	81.0	(* 1)
July		169.0	224.3	122.5	131.8	(* 1)
October		108.1	205.8	82.1	112.3	(* 1)
December		119.0	254.8	90.4	103.0	(* 1)
March	1989	177.6	309.3	131.8	138.8	(* 1)
June		151.6	314.4	113.0	165.7	(* 1)
September		130.8	256.0	99.2	112.0	(* 1)
December		123.3	270.3	77.9	157.6	(* 1)

TABLE 18

Hospital German Urquidi, 1990

Distribution of Payments: Normal Del.

Amount (Bs.)	Without Drugs	With Drugs
<80	5%	1%
81-90	8%	
91-100	25%	2%
101-110	45%	2%
111-120	9%	2%
121-130	1%	18%
131-140		24%
141-150		21%
151-160	1%	10%
161-170	1%	2%
171-180		3%
181-190		5%
191-200		
201-210		2%
211-220		
221-230	2%	
231-240	1%	
>240	1%	6%
Average Pmt.	107	152

Distribution of Payments: Cesarians

Amount (Bs.)	Without Drugs	With Drugs
<100	11%	
101-125	40%	
126-150	24%	2%
151-175	7%	2%
176-200	4%	7%
201-225	2%	7%
226-250	2%	7%
251-275	2%	18%
276-300	2%	13%
301-325		9%
326-350	2%	7%
351-375		4%
376-400		2%
401-425		
426-450		4%
451-475		7%
476-500		2%
>500	2%	9%
Average Pmt.	147	323

Distribution of Payments: Abort. Complic.

Amount (Bs.)	Without Drugs	With Drugs
<80	6%	3%
81-90	3%	
91-100	17%	
101-110	31%	6%
111-120	17%	
121-130	17%	6%
131-140	3%	14%
141-150		26%
151-160		6%
161-170		
171-180		6%
181-190	3%	
191-200	3%	6%
201-210		
211-220		3%
221-230		6%
231-240		
>240		20%
Average Pmt.	113	178

TABLE 19

Hospital German Urquidi
Revenues from Outpatient Fees
1987-1990

	No. of Outpatient Visits	Revenues from Outpatient Fees (Bs.)	Average Revenue (Bs.)	Average Revenue as % of Official Price
1987	3,958	21,693	5.48	91.35%
1988	4,193	22,171	5.29	88.13%
1989	4,815	27,285	5.67	94.44%
1990	5,382	28,216	5.24	87.38%

Official Price of an Outpatient Visit: Bs. 6

Hospital German Urquidi
Revenues from Maternity Fees
1985-1990

	No. of Normal Deliveries	Revenues from Maternity Fees (Bs.)	Average Revenue (Bs.)	Average Revenue as % of Official Price
1987	2,376	98,098	41.29	68.81%
1988	2,013	89,553	44.49	74.15%
1989	1,771	90,525	51.12	85.19%
1990	1,515	71,566	47.24	78.73%

Official Price for Use of Delivery Room: Bs. 60

TABLE 20

Hospital Quillacollo
Revenues from Outpatients
1986-1990

	Revenues from Outpatients (Bs.)	No. of Outpatient Visits	Revenue per Outpatient Visit (Bs.)	Average Payment as Percent of Official Price
1990	8,479	4,738	1.79	59.7%
1989	5,501	3,405	1.62	53.9%
1988	5,142	3,202	1.97	65.7%
1987		not available		
1986	2,172	3,736	0.98	39.4%

1986 & 1988: Revenues not available for some months;
these months not included in revenues per outpatient visit.
Official prices: 1988-1990 -- Bs. 3 per visit
1986 -- 2.5 million Bolivian pesos per visit

TABLE 21

Hospital Quillacollo
Revenues from Maternity
1986-1990

	Revenues from Maternity (Bs.)	No. of Deliveries	Revenue per Delivery (Bs.)	Average Payment as Percent of Official Price
1990	18,627	455	40.94	68.2%
1989	13,020	375	34.72	57.9%
1988	12,369	407	35.65	59.4%
1987		not available		
1986	3,505	304	20.15	33.6%

1986 & 1988: Revenues not available for some months;
these months not included in revenues per outpatient visit.
Official prices: 1988-1990 -- Bs. 60
1986 -- 60 million Bolivian pesos

TABLE 22

Cost Recovery--Consolidated (Maternity and Pediatrics)
Hospital German Urquidi, 1988-1990

	1988	1989	1990
REVENUES			
Sale of Services	406,995	461,553	417,396
Sale of Products	367,582	391,721	453,830
Pharmaceuticals	334,857	356,945	424,905
Other	24,673	45,975	34,278
TOTAL REVENUES	799,250	899,249	905,504
EXPENSES			
Costs without Perm. Personnel			
Drugs	439,867	391,648	411,557
Other	448,746	518,592	511,648
TOTAL EXPENSES	888,613	910,240	923,205
% COST RECOVERY			
Total	89.9%	98.8%	98.1%
Drugs	76.1%	91.1%	103.2%
Other	178.1%	173.4%	177.0%

TABLE 23

Cost Recovery--Detailed
Hospital German Urquidi, 1990

	Consolidated	Maternity	Pediatrics
REVENUES			
Sale of Services	417,396	309,185	108,211
Sale of Products	453,830	368,086	85,744
Pharmaceuticals	424,905	340,813	84,092
Other	34,278	30,013	4,265
TOTAL REVENUES	905,504	707,284	198,220
EXPENSES			
Costs without Perm. Personnel			
Drugs	411,557	369,156	42,401
Other	511,648	176,348	335,300
TOTAL EXPENSES	923,205	545,504	377,701
% COST RECOVERY			
Total	98.1%	129.7%	52.5%
Drugs	103.2%	92.3%	198.3%
Other	177.0%	401.1%	59.1%

TABLE 24

Cost Recovery 1990
 Diagnostic Categories
 Hospital German Urquidi

	Average Payment	Unit Cost	Net Revenues

Normal Delivery			
Total	152	89	63
Without Drugs	107	36	71
Cesarian			
Total	323	215	108
Without Drugs	147	58	89
Abort. Complic.			
Total	178	127	51
Without Drugs	113	44	69
=====			

TABLE 25

Net Revenues Generated a/
Hospital German Urquidi

	Total	Without Drugs
Normal Delivery	63	71
Cesarians		
75/25	108	89
50/50	69	78
All Complicated	-6	57
Incomplete Abortion		
80/20	51	69
50/50	-11	75
All Complicated	-118	31
Outpatient Services	-3.85	3.07

=====
a/ Assumes no change in average patient
payments.

Figure 1A

Discharges by Service Hospital German Urquidi, 1985-90

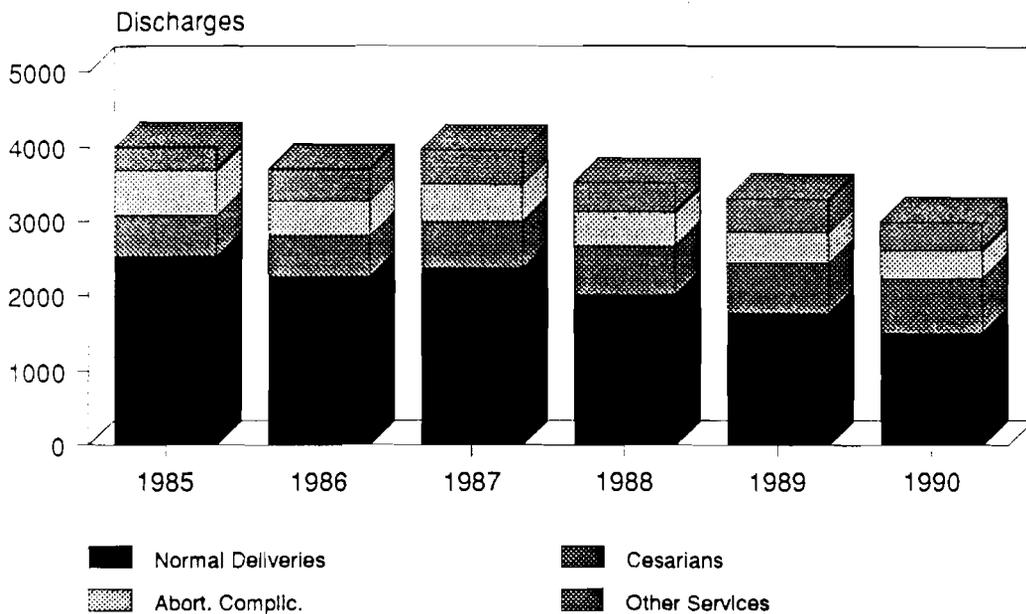


Figure 1B

Discharges by Service Hospital German Urquidi, 1985-90

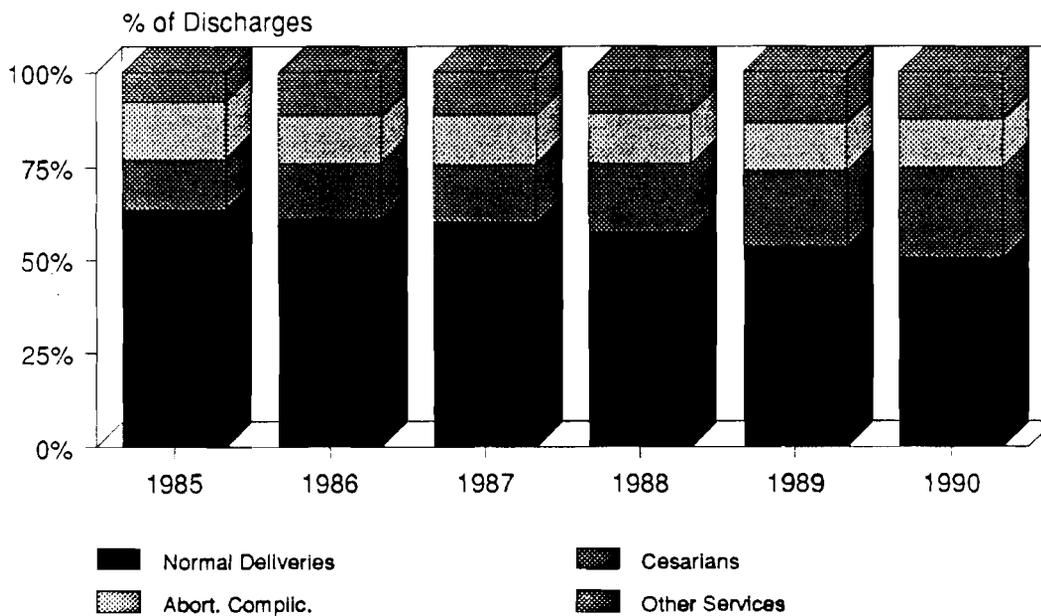


Figure 2A

Utilization of Services:
Discharges
Hospital German Urquidi

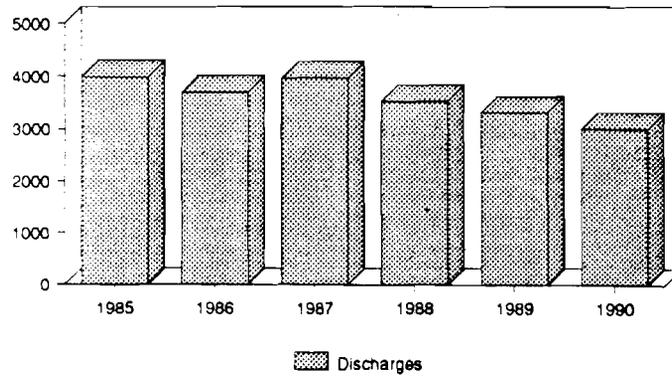


Figure 2B

Utilization of Services:
Total Patient Days
Hospital German Urquidi

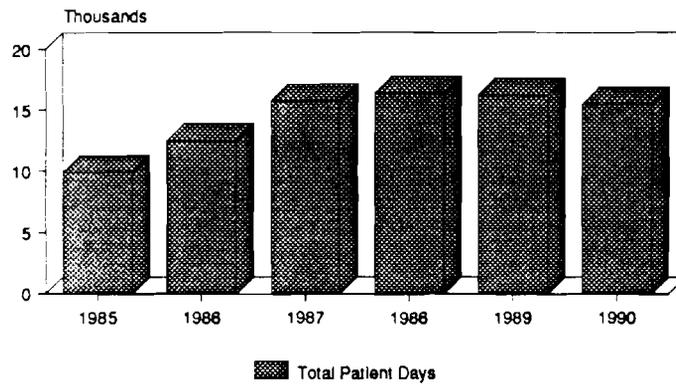


Figure 2C

Utilization of Services:
Average Length of Stay
Hospital German Urquidi

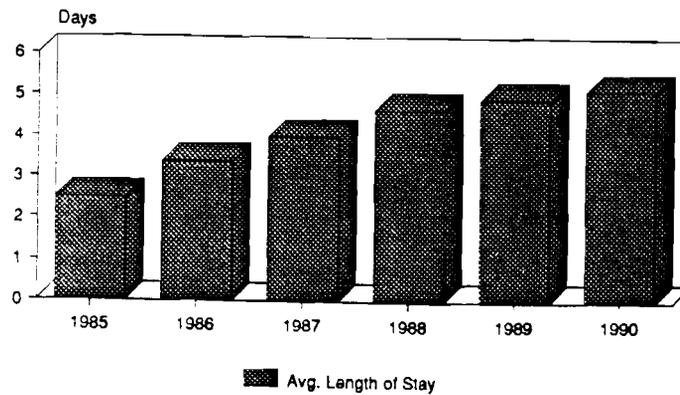


Figure 3A

Service Mix, 1985-90 Hospital Quillacollo

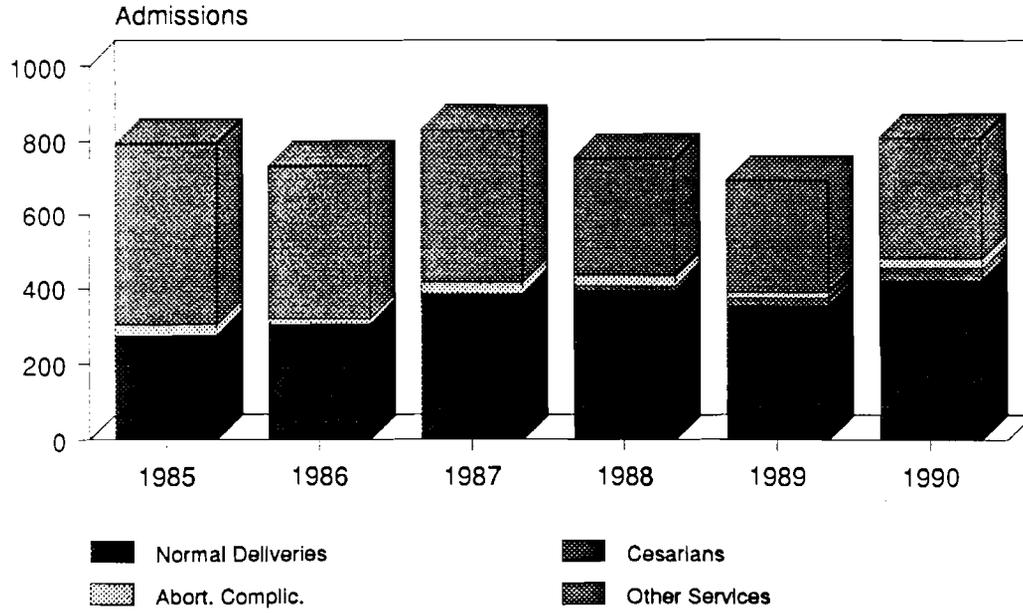


Figure 3B

Service Mix, 1985-90 Hospital Quillacollo

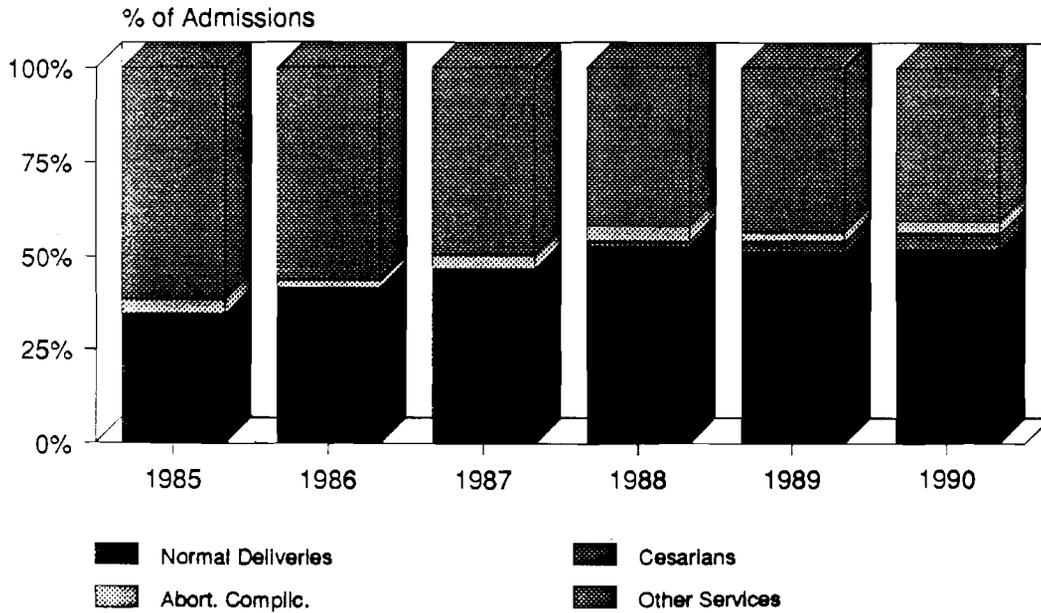


Figure 4A

Distribution of Lengths of Stay Normal Deliveries, 1990 Hospital Quillacollo

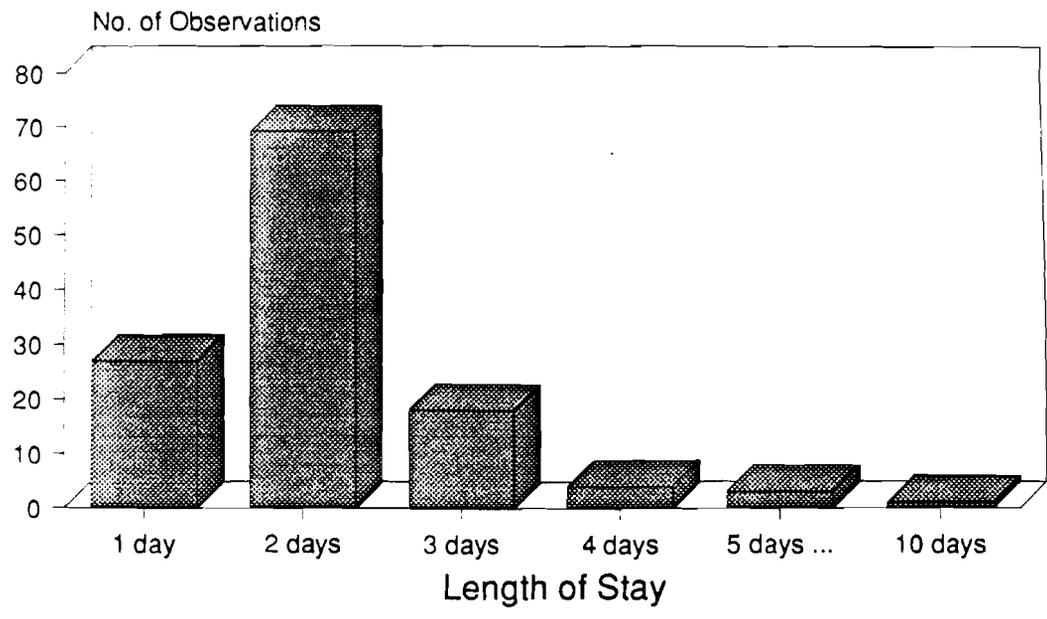


Figure 4B

Distribution of Lengths of Stay Cesarians, 1990 Hospital Quillacollo

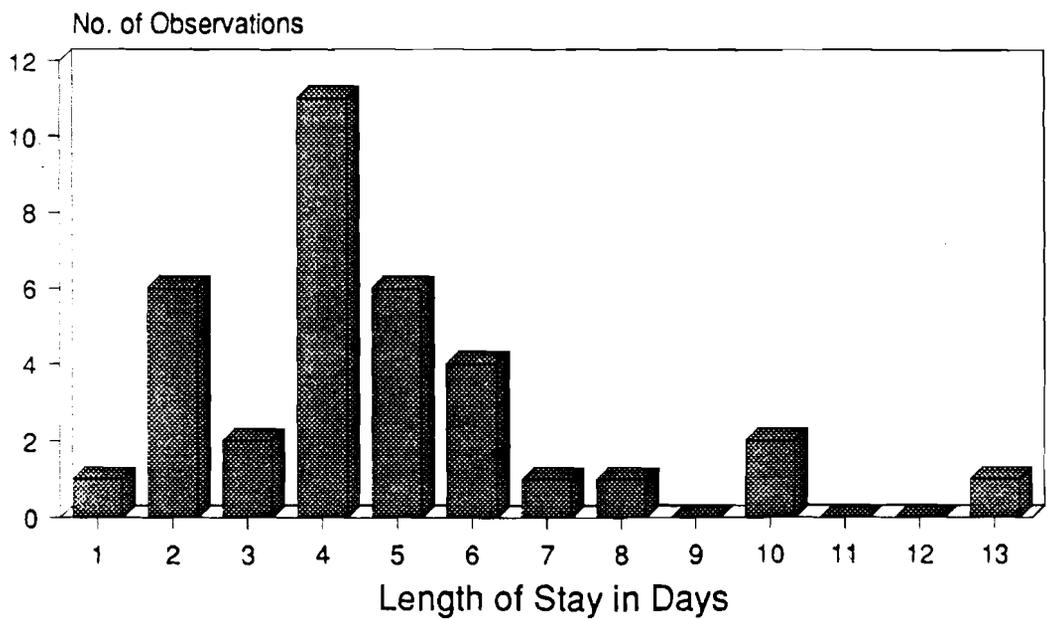


Figure 5A

Outpatient Visits, 1985-90 Hospital German Urquidi

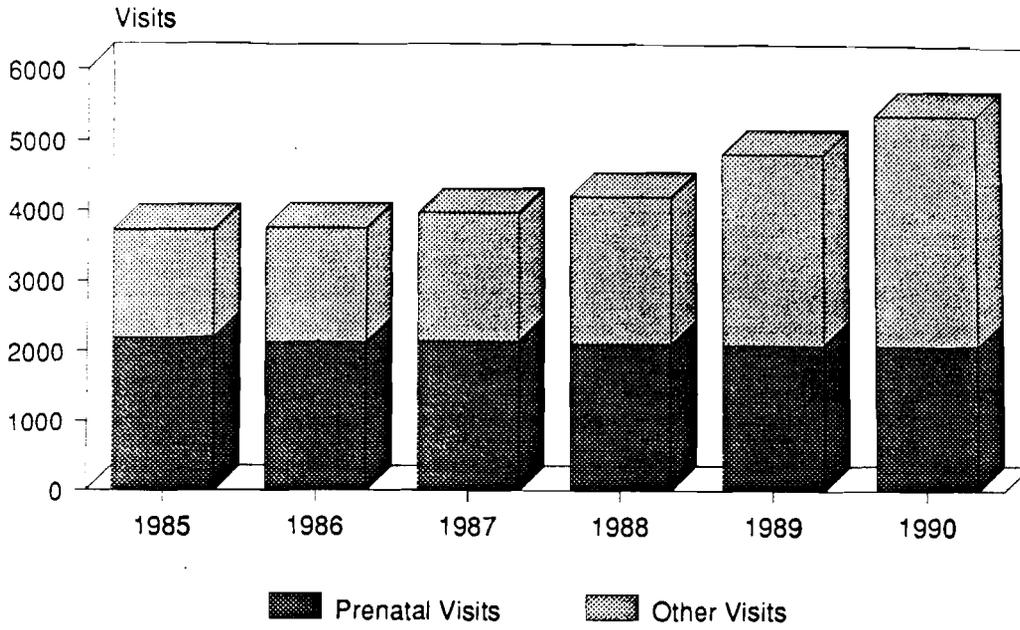


Figure 5B

Outpatient Visits, 1985-90 Hospital German Urquidi

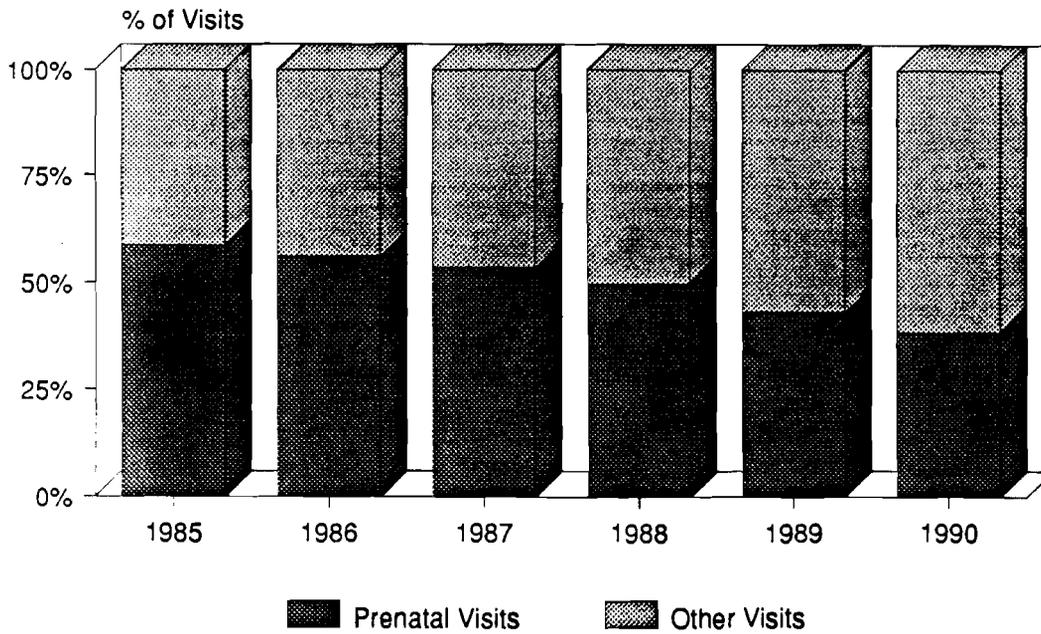
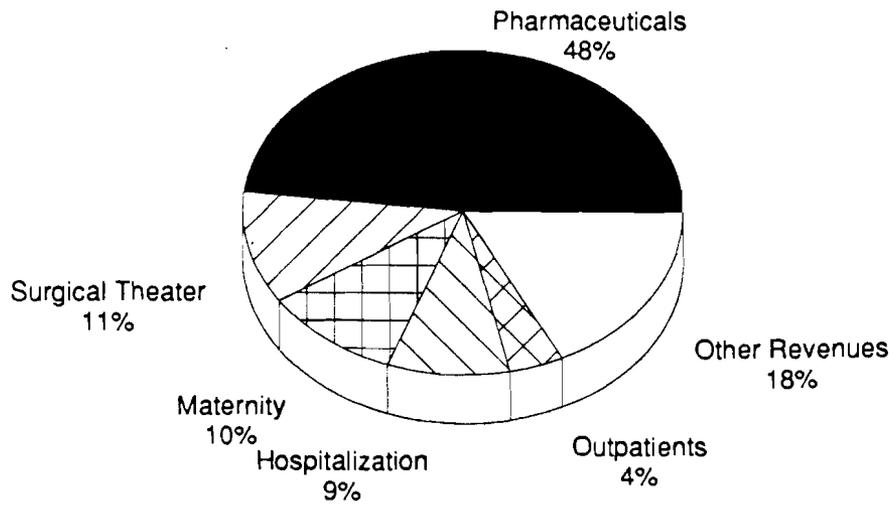


Figure 6

Distribution of Total Revenues Hospital German Urquidi, 1990



MotherCare/John Snow, Inc.
1991

Figure 7A

Distribution of Revenue Hospital German Urquidi, 1990

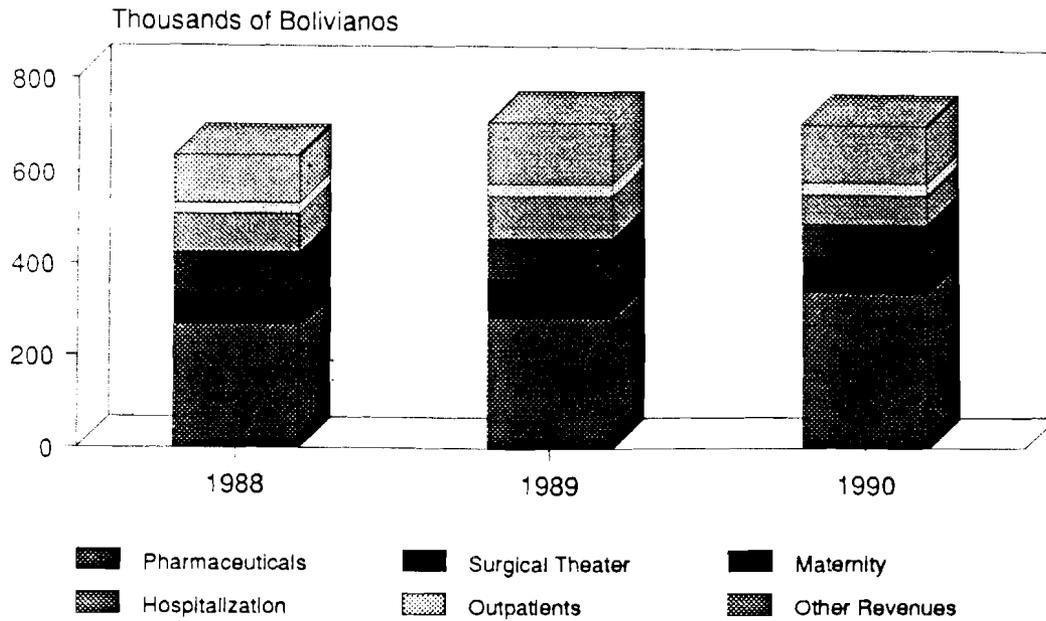


Figure 7B

Distribution of Revenue Hospital German Urquidi, 1990

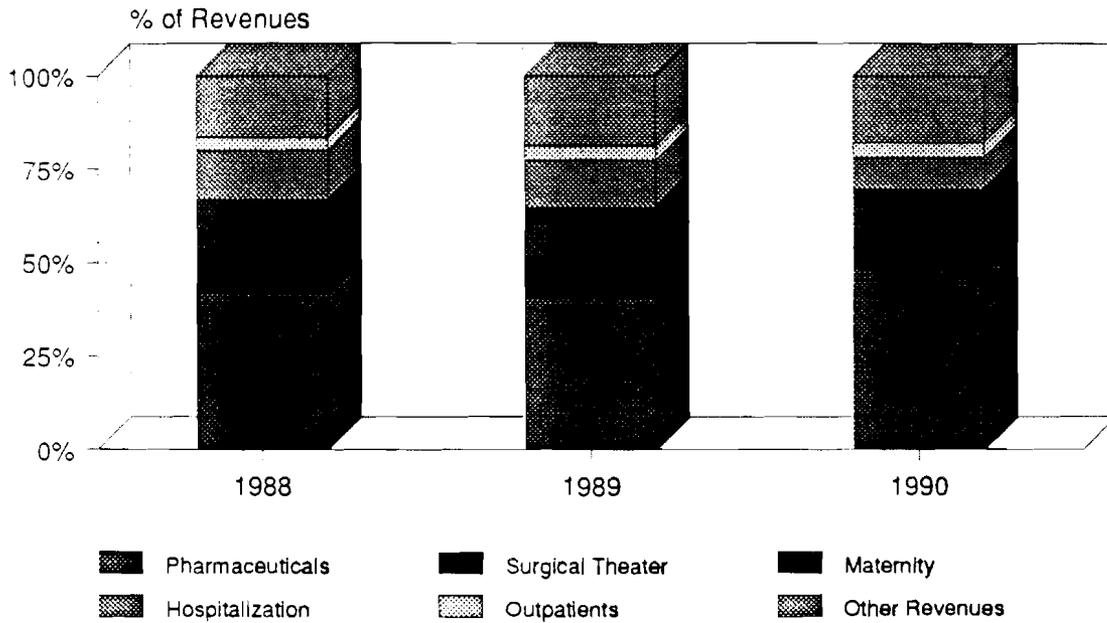


Figure 8A

Historical Maternity Payments 1985-1990, WITH DRUGS

Hospital German Urquidi

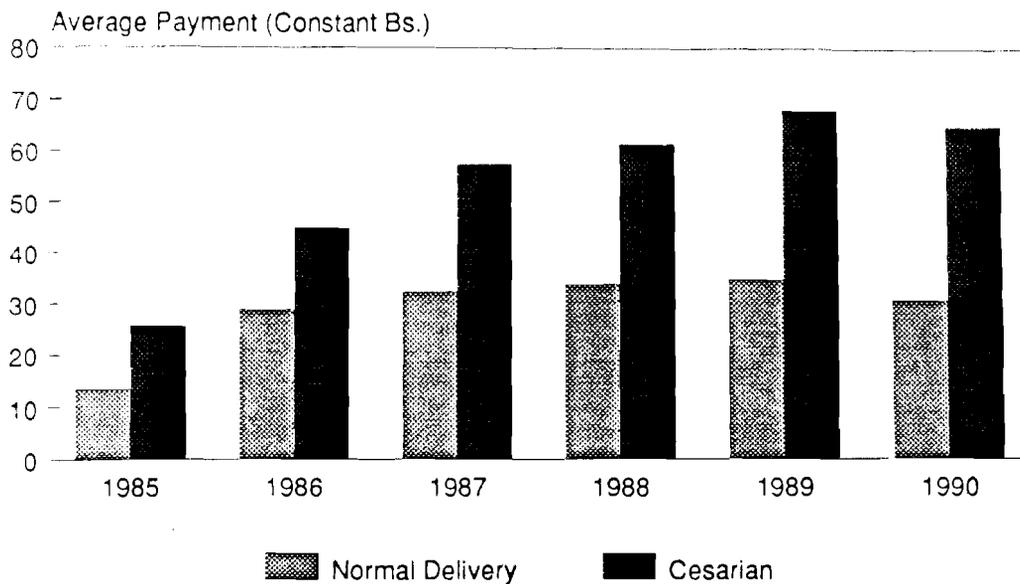


Figure 8B

Historical Maternity Payments 1985-1990, WITHOUT DRUGS

Hospital German Urquidi

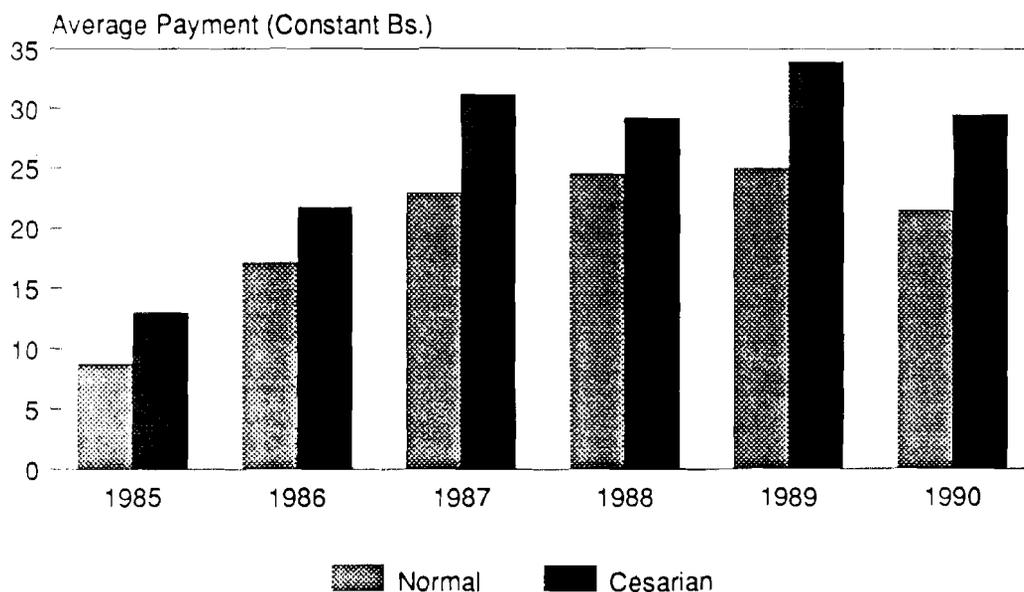


Figure 9A

Historical Maternity Payments 1985-1989, WITH DRUGS Hospital German Urquidi

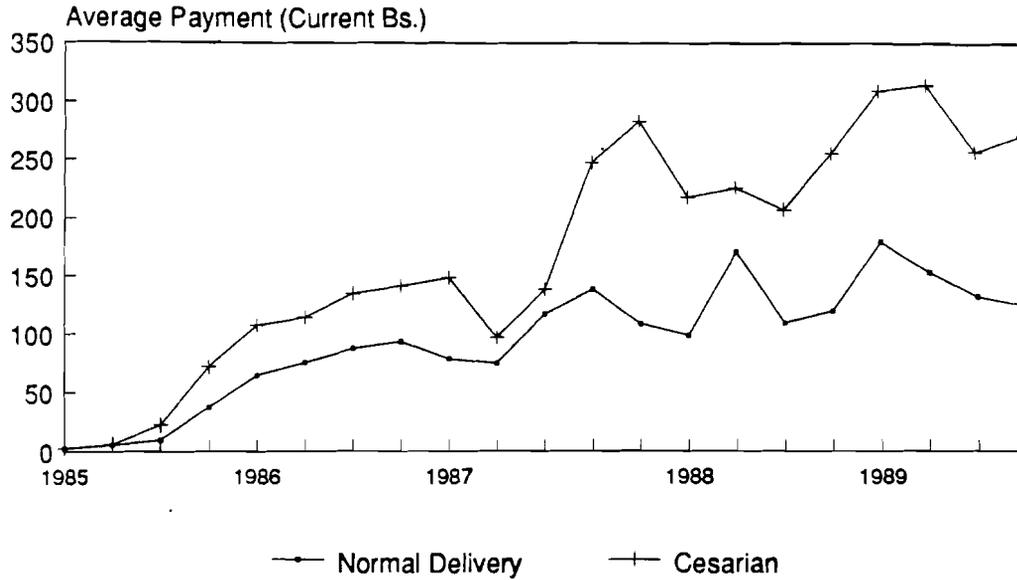
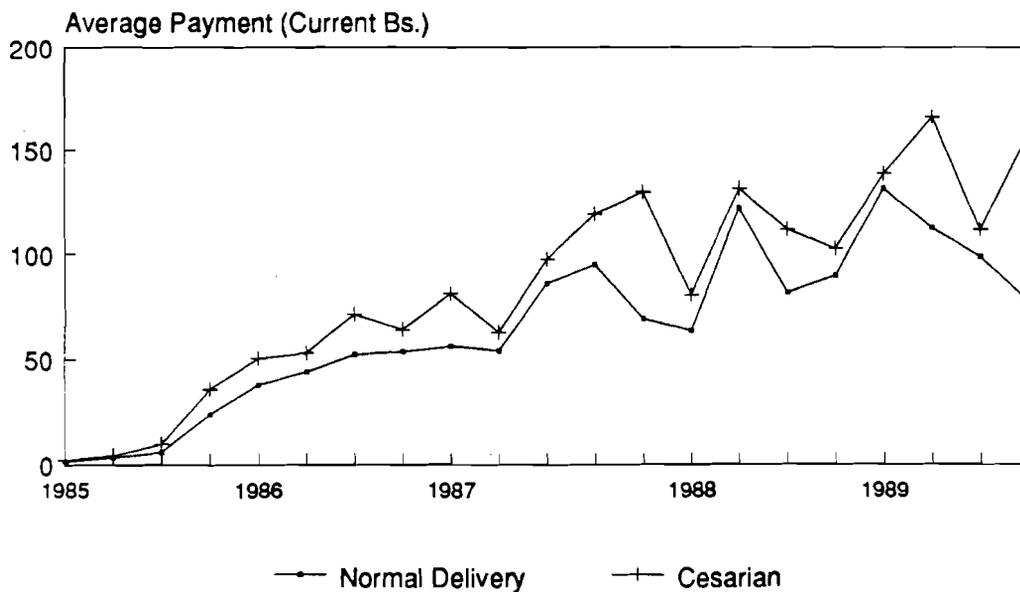


Figure 9B

Historical Maternity Payments 1985-1989, WITHOUT DRUGS Hospital German Urquidi



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