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Price Elasticity and Cost Recovery Experience in LDC Family Planning Programs

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TABLE OF CONTENTS

Page

I. Introduction 1

II. Economic Framework 3

A. Basis for Government Subsidies in Family Planning 3
Externalities 7
Expectations 8
Imperfect Information 9
B. Contraceptive Pricing 10

III. Obtaining Contraceptives: A Cost to Consumers . . . 14
A. Access Cost: Distance to Source 15
B. Transportation Mode and Cost 24
C. Waiting Time 27
D. Conclusion 29

IV. Do Contraceptive Price Affect Utilization? 31

A. Consumer Willingness-to-pay for Contraceptives. 32
B. Free Contraceptives and Acceptance Levels . . . 34
C. Effect of Price Changes on Contraceptives Use . 39
D. Who Benefits from Subsidized Contraceptives: Where Users Consumer 45
E. Importance of Prices in Determining Consumer Intent 52

V. Cost Recovery in Family Planning Programs 55

A. Consumer Contraceptive Prices in LDCs 55
B. Annual Costs of Contraception for Consumers . . 61
C. Household Family Planning Expenditures 65
D. Financing Public Family Planning Programs . . . 68
E. Cost Recovery Experience in LDCs 73
Contraceptive Social Marketing 74
Cost Recovery Comparison among Distribution Methods 76
Cost Recovery in Private Voluntary Organizations Programs 79
F. Cost Recovery Issues 80
G. Prospects for Cost Recovery 83

Bibliography 85

TABLES

Charts	Pages
Figure 1	5
Table III	16-17
Table IV-1	36
Table IV-2	41
Table IV-3	49
Table V-1	56
Table V-2	58
Table V-3	60
Table V-4	62
Table V-5	64
Table V-6	69
Table V-7	77

I. Introduction [1]

This paper is concerned with two interrelated issues of family planning financing in developing countries: pricing and cost recovery. As national and donor resources for population become spread more widely and absolute levels of funds shrink, family planning programs must either be reduced or alternative sources of revenue found. Charging consumers is one important option; however, doing so introduces issues of how contraceptive services and commodities can be priced and still maintain utilization rates, achieve equity objectives and ensure that a significant portion of family planning program costs are covered by users.

Underlying cost recovery potential are consumer demand factors, and more specifically, consumer sensitivity to contraceptive prices. Because contraceptive demand is a function of the full costs to consumers of reaching, obtaining, and using contraceptives, consideration of these factors is essential in assessing whether greater user financing is a realistic option.

In addressing the pricing and cost recovery issues here, a broad set of evidence is assembled and discussed. Existing experience and current procedures in family planning programs

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1/ I would like to thank Jerald Bailey, Brian Boulier and Phillip Musgrove for reviewing early drafts and providing useful comments. All remaining errors are my own.

together provide evidence on (1) the response of demand to a rise in cost recovery, and thus price; and, (2) the cost recovery levels possible from programs aimed at low income families. The trend in resource flows from traditional government and international sources is left aside, as it is thoroughly discussed elsewhere (See Lewison, 1983).

The paper addresses these issues in four sections. The first segment sets out a simple analytic framework and outlines the major issues associated with contraceptive pricing. In the second section the access costs of contraception are discussed. In estimating the impact of such costs on demand, existing data and research on the component costs of contraception -- access, transportation, waiting time and quality of services -- are drawn upon.

In the third, the impact of contraceptive price levels on demand is explored. Issues related to the free provision of services, consumer willingness to pay and income levels of contraceptive subsidy recipients are considered in some detail. The last section summarizes the prices consumers face for contraceptives at public and private outlets, outlines cost recovery experience in family planning programs, and discusses the potential for greater reliance on user charges in financing family planning services.

II. Economic Framework for Analyzing Pricing and Cost Recovery in Family Planning Programs

A. Basis for Government Subsidies in Family Planning

From their inception, the overwhelming majority of government-sponsored family planning programs in developing countries provided heavily subsidized contraceptive services. In most cases contraceptives were free. Three assumptions formed the basis for the decision: reduced fertility had high social benefits; individuals interested in family planning had (access to) inadequate information, thus preventing them from obtaining the means for limiting their families; 1/ and, the low level of monetization and exceedingly low per capita incomes in developing countries severely constrained couples' ability to buy contraception, even if supplies were increased. The interrelationships of these three assumptions, and their importance can best be seen and analyzed within a simple economic demand framework.

Individual demand for family planning is derived from couples' preferences for children and other goods, and constrained by their income and time. Social benefits of family planning are based on the externalities produced by lower

1/ Although such reasoning argues for subsidization of information and not commodities, commodity subsidization may be required to effectively inform through experimentation.

fertility. Because family planning use benefits the society at least as much as the individual, the free market price will generally not meet social welfare objectives, and government subsidies are required to equalize individual and social preferences.

Figure 1 summarizes the relationship between social and individual demand, and the role of government in encouraging socially optimal family planning use. Individual demand, D_M, lies below the socially desirable level, D_S, because of the higher social benefits family planning use produces. S_1 is the market supply of contraceptives sold at marginal cost to consumers. At the free market price, P_{mc}, price equals marginal cost, and Q_0 is consumed. However, the quantity Q_0 is below the social optimum quantity, Q_1.

In order to reach consumption of the social optimum, government subsidies are required. Lowering the price to P_1 would raise individual demand (D_M) to the optimal social quantity, Q_1, where marginal social benefit equals marginal cost. Therefore, reaching the optimal level, Q_1, requires a government subsidy of HDCG. Since BCDA represents the social benefit of increased consumption, AFD is the net welfare gain from subsidizing contraceptive supplies.

The divergence between individual and social demand (D_M and D_S, respectively) can be explained by externalities, differences in individual and societal expectations, and imperfect information.

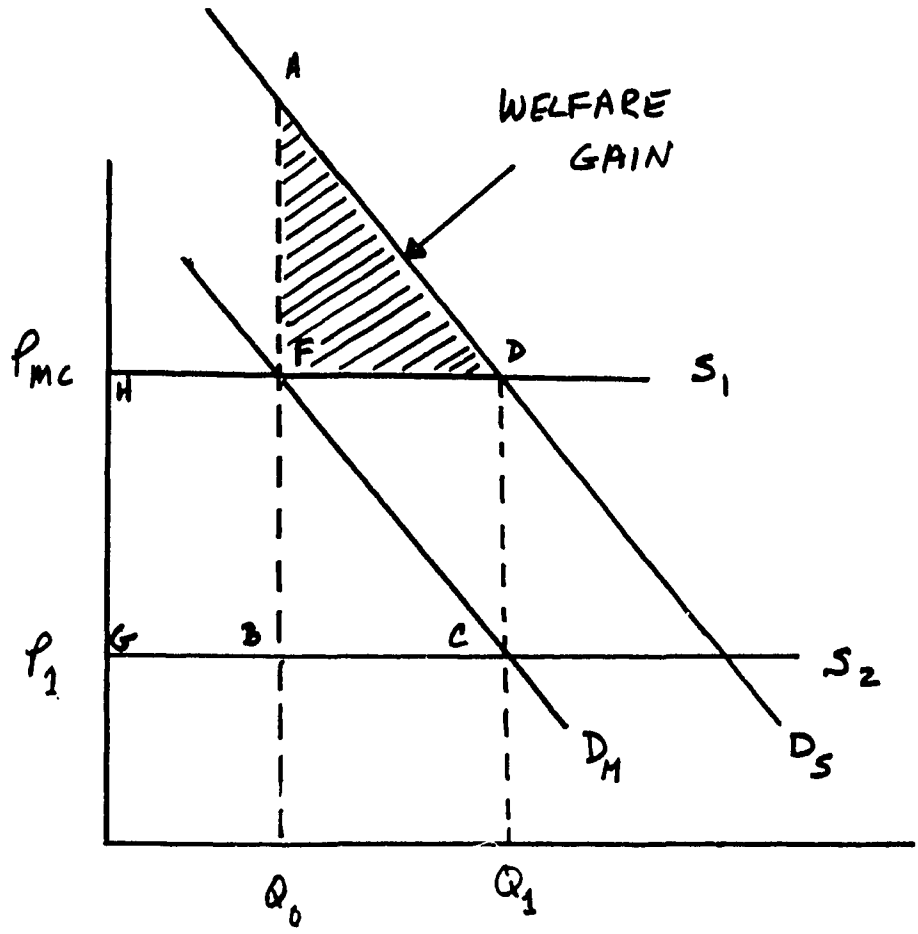

FIGURE 1

Cost-benefit analyses of population programs have consistently shown exceedingly favorable net social benefits to reducing fertility. The seminal work by Enke suggested that the net benefits to society of preventing births were so high that even government transfers to couples agreeing not to have children would be economical (Enke, 1960a; 1960b; 1966). Moreover, his analysis showed program costs as trivial compared to the social benefits of reduced fertility. (Enke, 1966).

Zaidan's (1965) refinement of Enke's model considered the differences between individual and social benefits, the former measured by per capita income. Although both produced strong positive benefits, his results indicated that benefits to individuals exceeded social returns by a factor of two. Theoretical benefits to individuals were ascribed based on perfect information and measured solely by income per capita. The actual perceptions of households were obviously not incorporated.

These two studies and the macroeconomic modeling exercises of Coale and Hoover (1958), Demeny (1965) and others confirmed the positive social benefits of reduced fertility, and reinforced the concept that government subsidies for family planning were warranted on economic grounds, due to negative externalities of high fertility. 1/

1/ A major difficulty in all of these studies is how social benefits are measured. The arbitrary nature of that measure makes the policy implications somewhat tenuous, often overestimating the value of social benefits.

Externalities: On a household level, an additional child may not increase parental costs if the consumption level of siblings is reduced and the childcare responsibilities of elder children and other family members are increased. Effectively, family resources can be spread more widely and the costs of the marginal child shared among family members (Boulier, 1977). Where national fertility is high, society contributes to raising a child not only through direct expenditures on services but also through coping with the resource losses -- such as environmental degredation -- and restricted agricultural output associated with population pressure.

Society bears the costs of high fertility through its support or subsidization of health, education and other services, since the larger the family the greater the cost to society. Moreover, society's investment in the marginal citizen may not generate adequate returns in terms of future production or tax revenues. Indeed, the degree of subsidy rises as the difference between the present value of taxes paid by an additional child and the present value of public expenditures increases (Robinson and Horlacher, 1971).

Where population pressures cause deterioration of the natural resource base through indiscriminant and/or intensive consumption of water, firewood, topsoil and other resources, society pays the price. Moreover, agricultural growth potential becomes more difficult with the deterioration of soil

and water resources, and agricultural surpluses are reduced as food consumption rises.

Such patterns in response to rising fertility impose net costs on society, and a dwindling resource base constrains economic growth. Parents do not absorb the full cost of the marginal child then if households and society are implicitly willing to assume much of the burden.

Expectations: Many couples in developing countries face considerable incentives for having large families because, among other things, children contribute to household income and production from early ages in LDCs and and household social status often derived from children. Society benefits from higher quality children, because human capital investments yield more productive individuals, which enhances both household and national production. Households often choose a larger quantity of children rather than fewer high quality children, where human capital investments -- such as health and education -- are unavailable or unaffordable. Such household behavior is caused by uncertainty, especially with respect to mortality. Since returns on investment cannot be predicted with confidence, a larger number of offspring raises the probability that one child will survive and succeed and generate returns on the parent's total investments in children (Boulier, 1977).

While marginal additions to the family are perhaps beneficial to the household on a net cost/benefit basis under such circumstances, an additional child places increasing burdens on the government with respect to social service provision. The marginal social cost of an additional child often is not outweighed by the marginal benefits to society, as indicated in the previous section. Hence the divergence of social and individual expectations.

Imperfect Information: Although couples might desire smaller families, the means for reducing fertility may be unknown, and effective means unavailable. The failure of the contraceptive market in many developing countries can be ascribed to a lack of information -- and therefore effective demand on the part of consumers -- and the reluctance of the private sector to market where demand is uncertain, and costs of distribution high.

Individual households are rational given their objectives and resources, and because society does not benefit in an identical manner, government must intervene to encourage achievement of social objectives. This can be accomplished by increasing the costs of children or decreasing the cost of limiting family size, through taxation, incentives, or subsidies, which can alter households preferences. Creating incentives through direct taxation, while common in the developed countries, is impractical in developing countries

because the tax systems tend to be inefficient in countries with pressing population growth problems.

Implicit incentives for large families -- some of which have been instituted in Europe to promote fertility -- include generous maternity leave, subsidized pre- and postnatal care and health costs generally and increasing tax deductions for each additional child. In countries like Singapore, government programs decreasing deductions as the number of children increases, giving schooling preferences for only the first two children and allowing smaller families preferential access to other government services encourage couples to limit family size.

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The information constraint cannot be effectively addressed through taxation. In changing expectations, incentives and subsidies are the most practical means for promoting increased information flow, and encouraging households to internalize externalities. Government (donor) subsidies for family planning programs contribute to the distribution of information, access to contraception, reducing the cost of trying and/or using contraceptives.

B. Contraceptive Pricing

Where high fertility represents a net cost to society, government subsidies are warranted to encourage utilization of

family planning. The question is, how extensive should subsidies be, and how should they be allocated? Oversubsidization is an inefficient use of resources and finding the optimal price and subsidy is therefore desirable, if difficult. Part of the difficulty is identifying the actual costs of family planning to users.

Consumers face a number of costs other than merely the price of the contraceptives themselves, including:

-- distance to the source of supply, including the opportunity cost of time and direct travel costs;

-- opportunity cost of waiting;

-- opportunity and travel costs of futile trips to closed or oversubscribed family planning services;

Quality of services also directly affects the costs consumers face. Lack of sufficient privacy, and poorly trained or managed personnel entail psychological and time costs that can exacerbate the costs already listed.

Commodity charges are then only one of the costs facing users, albeit important ones. In fact, zero money price might produce lower than desired usage levels, due to: (1) inefficiencies encouraged on the production side -- a cost which consumers pay with time and travel costs; and, (2) the low value ascribed to products with zero price.

If government subsidizes the price of contraceptives so

that consumers pay nothing for family planning services, demand might be no higher than if nominal fees were charged, and conceivably could be lower. The queuing time and visits to unstocked or closed government facilities entail costs to users which could outweigh the price savings on commodities.

Low prices might also deter use due to psychological factors. Some evidence on consumer perception of give-always implies that this may pose a problem for free service programs (Stycos, 1962). Costs reflect value: free goods are often viewed with suspicion, and exceedingly low prices are associated with poor value (Blair, 1972; Howell and Seims, 1979).

If low prices discourage use, demand may be inelastic with respect to price below some price. If so, where a government subsidy (free services) might be likely to raise demand, a full subsidy would not increase demand, and would thereby constitute oversubsidization. Thus, a free service policy, might backfire if service delivery deteriorates and/or consumer perceptions of quality reduce demand.

In summary, the need for government subsidies emanates from a divergence between the net benefits to society and to individual households of an additional birth. This fact, coupled with lack of information, reduces demand for contraception. Government family planning subsidies,

particularly for the less served and lower income populations, may compensate for imperfections in the contraceptive market.

In reaching their objectives of lower fertility and greater cost recovery, subsidies can be excessive, and thereby discourage consumption. This has positive implications for greater cost recovery and higher utilization of family planning, provided prices are not raised to where demand begins to fall. The following sections pursue these issues in greater detail.

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III. Obtaining Contraceptives: A Cost to Consumers

The cost of contraceptive commodities and services represents only a fraction of the true costs of contraception.1/ Distance to sources, regularity of distributor hours, consistency of commodity and service availability, as well as privacy and quality of care constitute actual costs of contraceptives. As already discussed, access and contraceptive costs have historically been perceived as the major barriers to use. Accordingly, family planning programs have stressed free services and maximum supply availability. However, the less recognized transportation, and time costs also impose a price on consumers.

This section summarizes and discusses the analytic studies which consider these topics. In particular, we examine the effect of distance on contraceptive use, the availability and use of alternative transportation methods, and the direct travel costs of reaching contraceptive outlets. The latter is suggestive of the transportation contraints facing potential users, especially low income couples.

1/ Although not discussed here, side effects and other health related complications impose costs on users. See Shearer (1983) for a discussion of these issue.

Access Costs

Access measures are meant to capture the ease with which (potential) contraceptive users can obtain contraceptives, and to convey the extent, nature and convenience of contraceptive supplies. Unfortunately, available data are based on interviews with women who know of a contraceptive method, which does not necessarily reflect actual contraceptive availability. Much of the existing analyses attempt to causally link access with contraceptive use, in determining the importance of supply to contraceptive use. Although flawed, the literature examining this association between availability and family planning use is a rough gauge of the opportunity costs of obtaining family planning services; moreover, it is the only evidence available to assess access costs.

The most common definitions of access applied in family planning studies are distance to (a close) source of family planning, knowledge of family planning outlet(s), and travel time to source by method. Of these, travel time to source by method is the preferred measure of access, since it is the best proxy for distance.

Recent studies linking access to contraceptive use are summarized in Table III-1. The CPS and WFS have been drawn on exclusively for these studies.

TABLE III-1

SUMMARY OF ANALYTIC STUDIES EXAMINING EFFECT OF ACCESS ON CONTRACEPTIVE USE

Reference Data Source Location (Sample Size)	Location and Sample Sample Size	Definition of Access	Method of Analysis/ Dependent Variable	Main Finding	Comment
Jones (1984) WFS (1978-80) Ghana Paraguay Sudan Venezuela Philippines	Currently married women below age 45 who know of a method.	Travel time to source of method by method; distance; travel time; means of transportation; length of wait.	Logistic regression. Categorical dependent variable (use of method in question, other efficient method, inefficient method, and non-use).	Controlling for residence, education and number of children, little impact of travel time on use is apparent, except in Egypt.	Difficult to compare across countries; have biased sample: high degree of missing data as limited to women who know specific methods.
Cornelius & Novak (1983) CPS (1980-81) Costa Rica (2350) Colombia (2357) Thailand (6020) Honduras (2013) Nepal (5469)	1) Potential users; 2) Women currently using resupply method; 3) Preferred method of users (pill or female sterilization).	Travel time to ~~time~~ to source by method.	Multiple Classification Analysis. Dependent Variable: re- 1) using resupply method. 2) method would prefer to use.	Among all users who know a source, all countries except Honduras show drops in use rates as time-to-source increases; differences in prevalence rates by distance is minimal. Among non-users prevalence is inversely related to distance if live farther than 15 minutes from family planning source. In rural areas of Colombia and Honduras, time to source is most important determinant of contratraceptive use, especially for the pill. Clinic sources (pill and female sterilization) affected by distance.	Accessibility may be a proxy for family planning information, or modernity, which is associated with demand for smaller families.
Entewisle et al (1982) CPS (1981) Thailand (4,956)	Women 15-44, married or in a union at time of survey.	Trichotomous dummy variable: proximity to (1) district center; (2) tambol health center; (3) neither (1) or (2).	Logistic Regression Dependent Variable: current use of an efficient contraceptive method.	Availability increases the the likelihood of contracepting in the total sample, and especially among women over 35; the desire for no more children has the most significant effect on the likelihood of use for all age groups,when controlling for age, education and desire for more children.	Doesn't Control in overall sample for age or education; would have been better not to include sterilization because if sterilized, distance becomes irrelevant.

SUMMARY OF ANALYTIC STUDIES EXAMINING EFFECT OF ACCESS ON CONTRACEPTIVE USE

Reference Data Source Location (Sample Size)	Location and Sample Sample Size	Definition of Access	Method of Analysis/ Dependent Variable	Main Finding	Comment
Pebley & Brackett (1982) WFS (1978) Philippines (6,771)	Married, fecund, non-pregnant women at time of interview. Users of traditional and modern methods who know an outlet.	Knowledge of family planning outlet; cost and travel time (in minutes) by method.	Logistic Regression Dependent Variable: whether or not a woman is using contraceptives; method of contraception currently using.	Controlling for age, parity, urban residence and religion, once an outlet is known, travel makes little difference in use. Multivariate analysis shows cost as a significant positive correlate of method used, but no consistent effect of travel time on method used.	Discusses results of various estimated models not reported in paper. Per period costs and time may be overestimated if consumers purchase multiple contraceptives at one time.
Rodriguez (1978) WFS (1974-1976) Colombia (1,866) Costa Rica (2,382) Korea (4,338) Malaysia (4,482) Nepal (319)	Currently married women, including consensually married.	Travel Time	Analysis of Covariance. Dependent variables: 1) Percentage of currently married women currently using an efficient contraceptive. 2) Percentage not currently using an efficient contraceptive.	Controlling for years since first marriage; number of children, urban/rural residence, mother's education and desire for more children, access becomes a significant variable in Nepal. Access becomes significant when it is introduced before the controls everywhere but in Costa Rica. Only in Nepal does access matter with controls introduced.	Aggregation of the dependent variable into a percentage inhibits interpretation of individual behavior; thus the importance of travel (time) costs of contraceptive prevalence traceptive prevalence is hard to access.
Akin, Guilkey, Paqueo (1984) WFS (1978) Philippines (6,771)	Women who use any purchased or non-purchased methods of contraception.	Time to reach place where condoms/IUDs/pills/sterilization obtained.	Multinomial logistic regression; Categorical dependent variable: probability of using: 1) pill; 2) IUD; 3) condom; 4) rhythm/withdrawal; 5) abstinence, 6) sterilization.	Controlling for prices and socioeconomic factors, travel time reduces probability of condom use and, to some extent, of oral use; travel time increases probability of sterilization and IUD use.	High degree of missing data; costs of transportation not available.

It should be noted that none of these surveys were undertaken expressly to measure the cost of access, and virtually all of the studies discussed here take the data beyond their intended use of indicating how well public contraceptive supplies are reaching potential contraceptors. Moreover, knowledge and access become so interrelated in these surveys that it is difficult to disentangle the separate effects of each.1/

Average distance to a source of contraception or distance to closest outlet, while useful as a measure of supply coverage, is only meaningful if computed in terms relevant to users. Consumer contraceptive preferences, the time and travel costs involved in reaching supplies, the convenience of that supply source (i.e. whether other sales or purchases can be made at the same site), and the reliability and acceptability of the closest source all affect consumption patterns and jointly define access, but are rarely considered in prevalence surveys. As will be seen below, the closest source is not always the preferred outlet where alternatives are available. Moreover, outlets generally do not supply all forms of contraception, and methods are generally not perfect substitutes.

An additional problem with access measures is the variation between perceived and actual distances. Rodriguez's

1/ Indeed, Pebley & Brackett (1982) find that knowledge and distance are almost perfect substitutes.

(1977) correlation of the actual and perceived distances to a family planning outlet for India, Panama and Turkey produced figures of .88, .81 and .77 respectively. Correlations between actual and perceived time and transport costs were .79, .64, and 79, respectively, implying that people in these three countries were reasonably well aware of the time and transportation costs of reaching contraceptives sources. Similar data from CPS in Thailand and Costa Rica (Lewis & Novak, 1982) indicate no difference in perceived distance to source by Thai women. However, in Costa Rica, women at risk of pregnancy expected longer travel times than women not at pregnancy risk, implying that some discrepancy arises depending on women's perceptions and relative "need" for family planning. But these accurate perceptions fail to convey the actual costs to users of obtaining family planning services.

Data quality most certainly poses difficulties with the WFS data, as the authors of these analyses themselves acknowledge (Pebley and Brackett, 1982; Jones, 1983). Indeed The confusion in interpreting the implications of research findings is probably due to data limitations -- both in terms of quality and appropriateness.

In effect, due to data problems true access has rarely been measured, since it is unclear whether it is the availability of supply or high demand that defines access. Moreover, because access questions are restricted to women who use a contraceptive method or know an outlet, the sample size

becomes reduced, and perhaps biases the sample towards those most knowledgable and mobile. In data analysis, data limitations lead to misspecification and insufficient controls, which can allocate undue strength to included variables, and confuse interpretation. While acknowledging the multiple drawbacks of existing studies, some preliminary conclusions can be drawn from them.

The results of the studies outlined in Table III-1 are mixed, although the sum of evidence suggests a minimal impact of distance on use, particularly for resupply methods. Where supplies are widely available and distance to source varies only slightly, travel time becomes an irrelevant factor in contraceptive use decisions, as Cornelius and Novak(1983) found in Costa Rica and Thailand, and Rodriguez (1978) found for Costa Rica.

This is true even when other socioeconomic characteristics are ignored. Entwisle et al (1982), without controlling for other factors, find a significant association between proximity of public sources and likelihood of contraceptive use for all women. However, dividing the sample into three age categories only produces significant results for women over age thirty-five. Rodriguez's (1978) uncontrolled results show travel time to be an important determining factor of contraceptive use, except in Costa Rica, where the high level of availability apparently limits the variation sufficiently to mute any association.

Existing studies which control for some socioeconomic effects, suggest that regardless of the degreee of availability, travel time is irrelevant, unless travel time exceeds one hour. Jones' (1983) individual based cross country study, Rodriguez's aggregate cross country (1978) analysis, and Pebley and Brackett's (1982) Philippine study all show contraceptive use and travel time as unrelated. However, Rodriguez (1978) and Cornelius & Novak (1983) did find access, or travel time, a constraint in Nepal where average travel time far exceeded that of any other country.

This evidence from Cornelius and Novak (1983) and Rodriguez (1978) implies that the relationship may be nonlinear: where distance to supplies is less than one hour travel time does not affect use; but where it involves significant amounts of time, distance can become an impediment to use. Moreover, distance appears to be a proxy for other socioeconomic factors, since in and of itself distance does not appear to significantly influence contraceptive use.

A recent reanalysis of the WFS Philippine data by Akin et al. (1984) has adopted a different approach and effectively poses a different but equally important question related to the issue of access costs and contraceptive choice. They examine the factors, including access time, which determine the probability of selecting one of six contraceptive methods. The findings indicate that travel time does reduce the probability of condom and pill use, but increases the probability of

sterilization and IUD use. This suggests that the time costs of resupply methods are often sufficiently high that other contraceptive methods become more attractive.

The analysis is not concerned with whether access costs determine contraceptive use, but how time costs contribute to the probability that a woman will select any particular contraceptive method. Although it does not address the issue of whether access deters contraceptive use, their approach is an appropriate means of measuring the importance of access as one factor determining choice of contraceptive method. In effect this analysis measures the extent to which time costs dissuades users from using different contraceptive methods.

Access costs have differential effects on family planning use depending on the method of contraception involved. Akin et al. (1984) find a clear distinction between resupply and permanent methods, as already mentioned. Similarly, Cornelius and Novak (1983) find distance totally irrelevant to use of "clinical supplies" (i.e., IUD and sterilization services). Travel time is inversely associated with use for clinical methods and, not surprisingly, average travel time to these methods is longer than the time to re-supply sources. Apparently the time costs associated with resupply methods make more permanent methods an attractive option, regardless of the high one-time price and time cost.

Two of the studies examine distance and non-contraceptors. In Rodriguez (1978), accessibility becomes unimportant

to the percent of women not currently using effective contraceptives among those who don't want any more children when all controls are introduced, except in Nepal. However, Cornelius and Novak's (1983) results show distance as a greater constraint to contraceptive use among potential users than among current users. These results are predictable, since the more elastic the demand, the greater the perceived constraints to contraceptive use, and it is assumed that the contraceptive demand of "potential users" is more elastic than that of actual users.

Essentially these analyses suggest that distance does not pose a critical impediment to use in most settings, although it may help determine the selection of method. However, we have little evidence on the cost of distance to users. None of the studies include income data for measuring the opportunity cost of time, and only Jones (1983) considers actual travel costs, and Rodriguez (1978) and Jones (1983) alone include transportation modes, which roughly captures the direct cost of travel.

Even these attempts at quantifying access costs fall short of the ideal, as they are hypothetical questions related to nearest source known, and not linked to actual use. Access is actually a supply efficiency indicator: how close are

supplies getting to potential users? 1/ We can conclude, however, that based on existing evidence, that among women who know a source, distance to source does not seriously affect contraceptive use, even among women not currently contracepting.

Transportation Mode and Costs

In addition to travel time, the money cost of transportation needs to be calculated. The WFS data are the single best source of data on this question.

As would be expected, average traveling time is consistently lower in urban areas than in rural areas, and rural women are therefore more likley to require transportation, or additional time to reach an appropropriate source of supply. Either way the costs to rural women are relatively higher.

The analyses by Rodriguez (1977) and Jones (1983) show that the mode of transportation selected by users varies widely. Moreover, since no income or price controls are provided the data are difficult to interpret. In Kenya and Paraguay (Jones 1983), for instance, women in rural and urban

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1/ In Akin et al. (1984), individual's perceptions of contraceptive costs for users and nonusers was rarely zero, and nonusers consistently estimated method costs above the estimates of users, suggesting that "potential users" would expect to pay more than what providers currently charge.

areas would rely heavily on buses for obtaining any methods of contraception; although the condom and pill are most often obtained on foot in urban areas of Paraguay. In rural Venezuela users most frequently use taxies and cars in obtaining pills, IUDs and sterilization. No data on the costs of these alternatives is provided, but we can assume cars and taxi costs exceed bus transportaton. Without information on the costs of transportation and the income of respondents, the relative opportunity and direct costs cannot be assessed, rendering the information only interesting.

Aggregating across methods, Rodriguez (1977) found similar patterns in rural Turkey: women were most likely to perceive a taxi or car as the best means of reaching the nearest contraceptive outlet. Buses were perceived as the common method of transportation in Panama; and rural Indian women would rely almost equally on trains, buses and foot.

The Ghanaian situation (Jones, 1983) is unique in that transportation supply constraints were included. As many as 48 percent of women who knew a source for some method of family planning had no access to transportation. Female sterilization produced the fewest transportation difficulties and condoms the most, especially in rural areas. Presumably the variation in difficulty can be attributed to the need to resupply condom supplies as oppossed one time travel for obtaining the permanent sterilization method. As would be expected, transportation posed a greater impediment in rural than in

urban areas in Ghana. If Ghana is typical, data from other countries either contain missing values, supply constraints are minimal or transportation preferences bear little relationship to realistic options.

The cost of transportation reported in the WFS for selected countries is even more difficult to interpret. Rodriguez (1977) provides local currency estimates of transportation costs to perceived nearest outlet by residence, but without income data.

On the cost of transportation, Jones (1983) indicates that 24% of Malaysian women who know a source and rely on public or private transportation to reach the nearest source pay less than $5.30 for transportation; 50% pay less than $9.00 and almost 70% pay less than $19.18 per trip. Given a per capita income of $1,090 in 1978 (IBRD, 1980), transportation costs alone can represent a significant proportion of average income, particularly where multiple trips are involved. And obviously lower income families will need to spend a larger proportion of income on transportation. Malaysian urban-rural cost disparities are not great but the costs are high: 33% of rural women pay over $20.00 per trip to the nearest source known, and 27% of urban women pay as much.

The difficultly of estimating actual travel costs is evident. Data are admittedly hard to collect, but without knowing the frequency of travel, ability to use multipurpose trips, income of consumers and costs associated with mode of

transportation cost figures can only provide rough estimates of the travel costs for obtaining contraceptives. From the cost data reported here, transportation costs are not trivial, and represent a significant fraction of income for poor families. No evidence exists to suggest how important travel costs are to contraceptive use at any income level.

Waiting Time

Queuing time represents one of the highest potential costs of obtaining family planning services from publicly subsidized programs. Recent evidence from the U.S. is instructive. A U.S. Public Health Service evaluation suggests that waiting time is the single biggest problem of Detroit inner city clinics. (SFP 8, 5 p. 130).

Patient flow analyses have been used to examine waiting time. Hudgins et al (1982) studied patient flow records for 883 family planning distribution sites throughout the U.S., and found two overriding problems virtually everywhere: waiting time is extraordinarily long and staff do not spend a large proportion of their time with patients. In this study, average waiting time was almost an hour, and only 35% of time in clinic was actually spent receiving services from the clinic staff. An indepth study (Graves and Hudgins, 1981) in a single public health center in a large U.S. city in 1978 showed average waiting time to be 147 minutes, or 44% of the time patients spent at the clinic. Jaffe's (1968) evaluation of active

hospital clinics in various parts of the US showed an average waiting time of 2 1/2 hours for family planning services.

For the LDCs, WFS data and patient flow analysis provide the only systematic data sources on waiting time. Jones (1983) compares the available data on length of waiting at the most recent visit for Ghana, Indonesia, Kenya and Lesotho, but the method sought was not indicated. In Lesotho urban women wait longer, but on average 43% waited less than ten minutes. In Kenya 50% of users wait less than an hour, and 25% wait over 2 hours. Almost forty percent of Indonesian women wait one hour or more. These estimates are based on users' recall from their last trip, which may or may not be representative for all users or all visits.

A more appropriate measure used by the U.S. Centers for Disease Control is patient-flow analysis. The method was applied to measure waiting periods in Brazil, Kenya and El Salvador. In the Sao Paulo Family Planning Association, patients averaged 1 to 2 hours of waiting (Hudgins, 1981); in El Salvador hospitals a 3 1/2 hour wait was involved, and family planning clinics required a 3 hour wait for contraceptive services (Hudgins, 1978). Dalmat & Graves, (1982) attribute an average waiting time of a half hour or less in Kenya to low demand. Essentially the high quality of services there reflect a severe underutilization of facilities and high costs.

Patient flow analysis represents a higher quality measure of waiting time than the WFS, since data are collected over a

fixed period and across patients, thereby avoiding recall problems, and relying exclusively on actual waiting time. However, neither data source allows interpretation of how waiting time affects utilization when controlling for other behavioral and demographic factors. But the method is a potentially valuable tool for collecting information on the cost of waiting.

Where no alternatives exist, the costs of waiting may be the necessary price of preventing a birth; low incomes may render the cost required for private sources unaffordable. However, where a tradeoff can be made between the costs of travel and waiting time, and purchasing private supplies, it is conceivable that the subsidized commodity entails too high a cost, especially in the LDCs. No data exist that can effectively address this issue at present. Essentially information on suppliers, behavior pattern of consumers, method preferences of users and their costs associated need to be collected concurrently, and analyzed jointly.

Conclusion

Consumers face serious costs in obtaining contraceptives, and not only for the contraceptives themselves. The time costs of waiting and travel, and the direct expenditures for travel can impose high costs to users. Data limitations prevent joint measurement of these multiple costs, and consequently it is not possible to determine the true cost of access.

The existing evidence does suggest that distance is not a serious impediment to use unless travel time is excessive, as in Nepal, where obtaining contraceptives entails a walk of an hour or more. However, even this information is biased toward those who know of a method and presumably have a relatively higher demand for contraception. By definition, access for those not contracepting is identical to that of contraceptors. Since this former group is never included in the surveys it is difficult to measure the true effect of distance on use. Thus the evidence is inconclusive, but it is clear that more focused survey work is required.

Travel costs and waiting time can be very long, but data limitations prevent examining these two costs simultaneously, and measuring their impact on use. Travel costs appear high for the few countries for which there are data, and based on a single case, transportation supply may pose a constraint to use in developing countries. Waiting time at publicly provided family planning clincs is generally long, but how this affects use has not been examined.

Thus very little can be said definitively about access costs. Better data would allow us to determine how important each of these factors is in constraining or promoting contraceptive use, and would complement the information discussed in the next section.

IV. Do Contraceptive Prices Affect Utilization?

Do contraceptives have to be free to attract and keep users, especially those in low income groups? Does the price make a difference in terms of number of users, income of users and continuation rates? Efficiency in family planning programs requires minimizing subsidies (and/or maximizing cost recovery) and maximizing utilization. In order to accomplish these objectives, we need to know what people are willing and able to pay, and how their preferences change as prices shift and as their incomes vary.

On the demand side, a couple's decision to contracept is affected by a range of socioeconomic factors that impinge on the perceived costs and benefits of children. When a decision has been made to limit or space children, information about and costs of contraception become important considerations for parents, both in terms of direct and opportunity costs.

Government's provision of family planning services have attempted to adjust for the market's inability to inform and supply consumers. And although these programs do not create demand, they effectively inform households of contraceptive options and prices, so that family planning decisions can be made with full information; moreover, these efforts contribute to increased supplies.

This section addresses a number of these interrelated topics, including couples' willingness to pay, the effectiveness of free versus family planning programs with user fees, effects of price changes on demand, and the beneficiaries of family planning subsidies.

A. Consumer Willingness-to-pay for Contraceptives

How consumers respond to contraceptive prices essentially measures their willingness to pay for contraception. Willingness to pay can be estimated indirectly by asking respondents what they would be willing to pay for contraceptive services, or directly by examining actual family planning expenditures of households (Birdsall and Orivel, 1983).

Documenting consumer responses to various prices for the same product is preferable to simply recording expenditures. Pinpointing the optimal price is best accomplished by measuring consumer response(s) to prices change(s), i.e. by measuring the elasticity of demand with respect to price. This measure reflects the expected tradeoff between cost recovery and maximizing use.

The indirect interview approach has been applied in the contraceptive social marketing (CSM) programs where subsidized contraceptives are sold through retail outlets, applying

standard marketing practices.1/ Private sector marketing relies heavily on analyzing consumer ability to pay, perception of value and purchasing habits -- as measured by surveys, focus group research and pricing experiments -- in establishing a profit maximizing price.

However, recent sociological research examining the relationship between the desire for additional/no additional children and subsequent childbearing in the developing countries suggests that attitudes (intent to use contraception) and behavior in family planning decisions are inconsistent (Hermalin et al, 1979). In other words, couples' theoretical preferences and their actual behavior do not correspond. Therefore, willingness to pay estimates derived from such methods are suspect and alone are inappropriate for guiding pricing decisions. Thus the direct approach, measuring actual behavior as a function of costs and other factors affecting demand for contraception, captures the true willingness of consumers to pay for services. Moreover, it indicates what level of cost recovery can be anticipated.

Unfortunately, no studies either in the U.S. or in the LDCs address the question of what consumers are willing and

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1/ The distribution system applies standard marketing practices as an incentive to private marketers, however, the product is priced below cost, which reduces both the price to consumers and the returns to distributors who are paid on percent of profit basis.

able to pay for contraception, either directly or indirectly. Thus we are forced to examine a range of studies that elucidate components of the issue, and on that basis piece together some conclusions.

B. Free Contraceptives and Acceptance Levels

The argument for free family planning services -- that household incomes in LDCs are too low to afford the financial costs of family planning (Kiser, 1962) -- neglects the fact that price reflects value and overlooks the observed behavior of millions of households in LDCs. Consumers generally prefer to pay for goods and services, for two basic reasons: price is associated with quality (Mohammed, 1969; Blair, 1972; Kiser, 1962), and in many societies users distrust free services (Morris et al, undated), often questioning the motivation of suppliers (Baldwin, 1978; Burkhart, 1981). Indeed, marketing strategies for contraception in Africa have specifically recommended that services not be provided free because of consumer contempt for free items (Blair, 1972); similar recommendations have emerged from AID's International Contraceptive Social Marketing project reports.

From a social viewpoint, fees provide greater assurance of effective use and minimal wastage (Population Council, No. 6, 1965; Talwar, 1969/70). Moreover, government efforts to make contraception affordable can backfire if commodities are

underpriced. Indirect marketing evidence for Egypt and India (ICSMP, 1983) and post-price rise increases in demand in Jamaica (Howell and Seims, 1979) and Sri Lanka (Abeywickrema, 1983) suggest that prices can be too low, depressing demand by reducing consumer confidence in the contraceptive market. Effectively, these findings suggest that the demand curve may be backward bending below some price. At some point perceptions may be such that consumers prefer to procure their contraceptives on the private market, or forego using contraception altogether. Raising prices can often reverse the declining trend in contraceptive purchases, as is discussed below in the segment on user response to price changes.

Another factor worth considering in deciding whether to charge for services and commodities, is that the cost of contraception is miniscule compared to the costs of raising a child. Once parents perceive the marginal net cost of children as negative (at least in the short run), the childrearing savings will far outweigh the costs of contraception. This obviously does not make commercial contraceptive products affordable, but it does suggest that free services may not be essential to use.

Are free services the answer to relieving the cost burden of commercial contraceptives? The evidence on this is mixed. Table IV-1 summarizes the existing controlled experiments which examine the relative attractiveness of free contraceptives.

TABLE IV-1

COMPARING THE EFFECTS ON CONTRACEPTIVE USE OF CHARGING FOR CONTRACEPTIVES OR PROVIDING THEM FOR FREE

REFERENCE(S)	LOCATION	STUDY DESCRIPTION	METHOD PRICE(S) (US$)	EFFECT OF FREE VS. FEES ON CONTRACEPTIVE USE	COMMENT
Cernada (1980); Cernada & Chow (1970); Gillespie, Chow & Chen (1970)	Taiwan	"Free Offer for a Limited Time" distributed by flyer to 8,000 households.	Free versus half price	20% of target population responded; raising target response from one third to two thirds. At least doubled number of acceptors.	During experiment, contraceptives including IUDs were available from private sources.
Cernada (1980); Gillespie, Chow & Chen (1970)	Taiwan	Orals sold at different prices in 3 different townships; other methods provided at same cost across areas. Experiment covered 14 month period.	Three prices for oral contraceptives: free, $.13 and $.25.	Little difference between demand for free and $.13 orals; $.25 drew half as many acceptors.	Subsequent program sold orals at $.25 and sales were poor until cost dropped to $.025: Monthly acceptance rose by over 100%.
Bailey & Umana (1978)	Colombia	Sold orals at two government health clinics and distributed them free at two others for one year.	$.10 or free per oral contraceptive cycle.	No difference in demand for free and $.10 pills.	Very small sample size and modest controls may be a problem.
Chen & Worth (1982)	Korea	Introduced free oral contraceptives and condoms into one township on Cheju Island. Hapchun County on mainland was control.	Free on Cheju for four months; Hapchun charged $.21/oral cycle and $.21 for 6 condoms.	No difference in prevalence between town where orals and condoms were free, and the others where charges were imposed.	Reported sub-study in Cheju for free pills and condoms did not show any difference in prevalence levels. Time periods of studies confusing.
Gadalla et. al. (1980)	Egypt	Two identical clinical programs with one fee for oral contraceptives, the other provided orals free.		Number of users at the two locations was identical.	
Morris et. al. (undated)	Brazil	Government introduced free oral contraceptives in urban and rural Piaui.		Free services attracted 50-100% of rural users away from private sector but only 2% of urban users.	Low demand for free services in urban areas may be due to multiple supplies, modest commercial prices, or inefficient or unreliable public sources in urban areas.
Akin, Guilkey and Paqueo (1984)	Philippines	Multiple logistic regression analysis of the demand for orals, IUD, condom, rhythum/withdrawal, abstinence and sterilization among all contraceptive users in the Philippines. Included perceived prices of each method, access costs and socioeconomic characteristics.	Users reported contraceptive prices for all methods.	Positive effect of price on choice of contraceptive. Zero prices dissuaded selection of that contraceptive method.	

The studies suggest that where moderate prices and free products are provided through similar, known outlets, as in Colombia (Bailey and Umana, 1978), Korea (Chen and Worth, 1982) and Egypt (Gadalla et al, 1980), demand is not very different for free and low priced contraceptives. Based on a single Taiwan experiment where consumers faced three price levels, the response to the moderate price ($.13) was identical to that of the free oral contraceptive. The higher priced orals, sold at $.25 per cycle, attracted half as many acceptors as each of the other two lower priced orals (Gillespie et al, 1970). Again, the implication is that demand is not affected by modest charges.

A variant on the controlled experience is a Brazilian program (Morris et al, undated) where the government opened family planning clinics in Piaui state for distribution of free oral contraceptives. Over 50 percent of rural users selected to shift away from private contraceptive sources in favor of free public commodities. Thus although women were willing to pay for services, they preferred the free service. In urban areas, the shift toward free commodities was minimal. The modest urban response may reflect a high opportunity cost of obtaining free services, or the inconvenience of public services. These may not be characteristic of rural stores, and public programs may be more convenient and appealing since

commercial outlets are few and far between.1/

While the foregoing studies have provided useful information on consumer preferences for free versus fee-based contraceptive services, none control for access costs or adequately for socioeconomic characteristics. Moreover, these efforts have focused exclusively on pills, and have neither considered the availability of alternative methods, nor examined the role of price in contraceptive preferences across methods.

A recent innovative study (Akin et al., 1984) has attempted to address these shortcomings using WFS data for the Philippines. The findings from their analysis across contraceptive methods suggests that free contraceptives discourages selection of a given method, since they demonstrate that as the price of one contraceptive increases relative to all other methods, the probability rises that the higher priced method will be selected. Although contrary to economic theory, the results may indicate that consumers equate price and quality, and that quality is highly valued. Further work is needed to expand and confirm the approach and the findings, but the analysis represents an important contribution in general, and complements the other studies reviewed here.

1/ The private sector does not always suffer with the introduction of free services. For example, in Thailand (Knodel et al, 1983), dropping the price for orals generated a rise in users without any effect on the private market (See Table IV-2).

Continuation rates were only examined in two of the studies. In Colombia the free services did not affect continuation rates, although free pills boosted continuation in the Thailand experiment (Knodel et al, 1983, See Table IV-2). The other studies did not consider continuation rates for oral contraceptives, leaving us with little basis for conclusion.

C. Effect of Price Changes on Contraceptive Use

We have already seen that when consumers face free and modestly priced contraceptives at different, trusted sources there is little variation in the number of continuing or new acceptors across suppliers. Because in these few controlled studies moderately priced commodities fared no differently than the free item, it implies that free services may oversubsidize contraceptives, since users are willing to pay (more) for family planning. But how does an increase or decrease in price affect utilization?

From available contraceptive social marketing program evidence, raising the price of an already moderately priced commodity does not reduce purchasing volume. In fact, Sri Lanka (Abeywickrama, 1983), Jamaica (Howell and Seims, 1979) and Colombia (Ojeda, 1981) CSM programs have suggested price increases to raise program revenues, confident that the rising costs would not affect utilization. Price increases in Sri Lanka (Van Wie, 1982) for condoms and orals, Jamaica for orals

If Jamaican prices were so low, there was practically no incentive for retailers to sell at cost fell.

and condoms (Howell and Seims, 1979), and Pakistan (Lewis, 1983) for condoms all exhibit the same pattern: reduced demand immediately following a price rise, and a gradual movement back to original levels (except in Jamaica where demand rose). In every case the short term drop is attributed to high commercial inventories prior to the anticipated price rise.1/

Price decreases have mixed effects on use, but in general raise demand. Table IV-2 summarizes the existing analytic studies examining the effect of family planning program price changes on contraceptive demand. Where fees are eliminated at established contraceptive outlets, either for a short time (Cernada, 1982; Cernada and Chow, 1970; Gillespie et al, 1970) or permanently (Knodel et al, 1983; Chen and Worth, 1982), contraceptive demand does rise. In Sri Lanka, Da Silva and Abeywickrema (undated) found that the introduction of vasectomy incentive payments -- and their subsequent increase -- had a dramatic effect on male acceptance.

Analysis from the Sri Lanka experiment suggests a shift in contraceptive preferences in response to the introduction of

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1/ Most CSM programs are run under government agreement and oversight, and prices cannot be raised without authorization. Hence the timing of price changes are public knowledge.

TABLE IV-2

SUMMARY OF STUDIES MEASURING THE EFFECT OF PRICE CHANGES ON CONTRACEPTIVE USE

REFERENCE	LOCATION	EXPERIMENT DESCRIPTION	EFFECT OF PRICE CHANGE ON CONTRACEPTIVE USE	COMMENT
Da Silva & Abeywickrema (undated)	Sri Lanka	Various incentive payments were introduced for male sterilization: 1) no payment prior to Jan. 1980; 2) Rs. 100 from Jan. to Oct. 1980; 3) Rs. 500 in Oct. 1980.	1) 250 men had been sterilized; 2) 400 men sterilized in ten months; and 3) 1,669 men sterilized in one month.	Those earning under Rs.500 per year were consistently the bulk of acceptors.
Chen & Worth (1982)	Korea	The National Planning Association decreased cost of female sterilization from $20.000 to zero.	Acceptance levels rose from 10 to 170 per month and was sustained at that level.	Details of study are spotty.
Family Health Division (1982)	Thailand	National Family Planning Program experimented with a doubling of the price of injectible contraceptives, from $.75 to $1.50. This was undertaken only in the Udornthani Province.	No effect on demand by new or curent users.	Study is incomplete, but authors suggest inconvenience of NFPP outlets compensated for difference in lower priced hospital supplies.
Cernada (1982)	Taiwan	Small advertisement placed in a local newspaper (140,000 circulation) indicating availability of oral contraceptives at one-third the commercial price of $1.50.	After three weeks, received 626 requests, with 75% from current users, and 25% were new acceptors.	72% of respondents said they would prefer the same price but through commercial outlets.
Cernada (1982)	Taiwan	Government reduced the oral contraceptive price from $.25 to $.025.	Monthly purchases increased from 2,500 per month to 6,000 per month.	
Knodel et. al. (1983)	Thailand	Government reduced the oral contraceptive price in the National Family Planning Programme reduced from $.25 per cycle to $.00.	Rise in oral contraceptive prevalence, with no apparent substitution of the free pills for comparable commercial products.	Demand for all forms of contraception rose during this period, hence the marginal effect of the price reduction is difficult to measure.
Cernada (1980); Cernada & Chow (1970); Gillespie, Chow & Chen (1970)	Taiwan	"Free Offer for a Limited Time" distributed by flyer to 8,000 households.	20% of target population responded; raising target response from one third to two thirds. At least doubled number of acceptors.	During experiment, contraceptives including IUDs were available from private sources.

incentive payments, since the only change of any consequence is the abandonment of temporary contraceptive measures in favor of a permanent method. The incentive payment itself was exceedingly generous, which may explain the price responsiveness of households. But, there is no question that the incentive payment appealed to potential contraceptors and currently contracepting men in Sri Lanka.

Decreases in the price of female sterilization in Korea (Chen and Worth, 1982) and oral contraceptives in two different Taiwan studies (mail order and oral contraceptive price change experiments, Cernada, 1982) resulted in dramatic increases in demand for contraception. In the Taiwan mail order experiment (Cernada, 1982), price was an important determining factor, since at least half of the acceptors were willing to pay full price if no alternatives existed. With no information on the constraints involved in acquiring pills, it is difficult to explain the popularity of the mail order program, other than to attribute its appeal to price. The large proportion prefering to use the local drugstore and their own time suggests that price was the deciding factor.

The other Taiwan experiment monitored consumer response to a price change in oral contraceptives. The experiment already discussed above, where three prices were charged in three Taichung townships -- indicating that $.25 was too expensive and would supress demand (Cernada, 1982; Gillespie et al, 1970)

-- was ignored in the pricing of oral contraceptives in the initial family planning effort due to revenue needs. Sales were sluggish at 2,500 cycles per month until 1970, when the price dropped to $.025 per cycle. Subsequently, monthly purchases jumped to 6,000 (Cernada, 1982).

Check prices
- its confusing
$.000
$.025 right?
no drop?

The Thailand experience is of particular importance because reducing the price had a large and sustained impact on the number of new acceptors. The zero prices on orals appeared to affect demand, since there was minimal switching from other sources or methods and a surge of new acceptors in response to the price decrease. Moreover, based on education levels, the more disadvantaged groups were the most likely to consume the free services.

Stocking contraceptives where consumers already receive/purchase related (health) services is likely to attract those already paying more for similar services. Under such circumstances, contraceptives can be obtained without a separate trip, and at a lower price. This may account for the strong response to free contraceptive availability in rural Piaui, Brazil (Morris et al, undated; see Table IV-1), rural Thailand (Knodel et al, 1983) and Taiwan (free offer experiment).

Mexico?

The only well documented case of consumer response to a significant price rise is that of Thailand (Family Health Division, 1983). A doubling of the injectable contraceptive

price at public clinics had no effect on the number of new or current users. Clear incentives to maintain users (because the public clinics retain profits) no doubt contributed to the success of the effort. The study conclusions suggest that convenience is an important factor in keeping clientele, since contraceptives could be obtained at lower cost at some additional distance away (Family Health Division, 1983). The same demand pattern emerged in Chiang Mai in a private fee-based family planning program (Baldwin, 1978). Few clients took advantage of the newly reduced price at government clinics, and instead continued to purchase contraceptives at their established source.

Another issue which could not be explored in this study, is the effect on demand of a dramatic price increase. This might well change the response of consumers, which would suggest a possible kink in the demand curve, due to higher demand elasticities as the price rises. The strong response generated in Korea by decreasing the price of sterilization from a high price ($20.00) to zero, may suggest such a pattern. Maintaining a modest charge would have enabled a better assessment of the price sensitivity of Korean women towards sterilization.

The results from all of the studies cited suggest that too high a price discourages contraceptive use, or at least shifts demand to traditional methods, since evidence from most of the

programs, unless otherwise indicated, did not report shifting among modern methods on any significant scale. At the same time, free pills do not appear to attract a greater number of users than do similar, modestly priced items when they are both assessable to households.

In these few controlled experiments, free services only appeared to affect acceptance rates where prices were reduced in an established program. Thus we conclude that although contraceptives can be too expensive for some (potential) users, a zero price -- even where public clinics are run properly -- does not make couples' decisions concerning contraception. Moreover, the price level is important: free commodities are probably unnecessary -- perhaps even detrimental given lower acceptance rates for free services -- but the commercial price can be too high for the average household.

D. Who Benefits from Subsidized Contraceptives: Where Users Consumer

Determining who benefits from family planning subsidies indicates whether government transfers are reaching the low income groups whose ability to pay is constrained. Moreover, consumer preferences for commercial products where subsidized clinical services are available would suggest that other (time and quality), unrecorded costs are involved.

A few studies examine income and use of family planning subsidies. In Hong Kong, Chan (1976) found that only the upper income and educated population did not take advantage of free IUD insertions, or condoms and pills at one fourth the pharmacy cost. Lack of a ceiling on patient income effectively subsidized the middle and lower classes as well as the poor. Because the subsisides were not targeted, those able to pay received the same subsidies as the lowest income groups. Unfortunately, no information is available on the proportion of acceptors from each group.

Mohammed's (1969) marketing survey in India showed that the lower middle and upper lower classes (those with incomes between Rs. 200 and 600, and below Rs. 200 per month, respectively) were the most frequent purchasers of the CSM Nirodh brand condoms, and that the vast majority were literate. The middle and upper classes were "put off" by the low price, and the assumed poor quality of the condom. In this instance, government subsidies were appropriate and efficient, effectively reaching the target population. Part of the explanation may be the successful market differentiation. Higher quality and expensive private sector products were available to those willing to pay the higher cost, and the subsidy therefore benefited those least able to pay.

A monitored Brazilian experiment in the low income Northeast used education as a proxy for income (Morris et al,

undated), and found that the free community based distribution effort attracted the less educated in both rural and urban areas.1/ Many of these users had previously purchased contraceptives commercially and simply shifted their supply source.

Where consumers select to obtain their contraceptives when multiple sources are accessible is an important means of understanding consumer preferences, and their willingness to pay different kinds of costs. As already discussed, waiting time generally represents a formidable impediment and cost at most public clinics everywhere. If there are a range of options open to consumers, how do they trade off time and income?

In Chan's (1976) Hong Kong study, clinics supplied 36 percent of condom users, 39 percent of pill and 60 percent of IUD acceptors. Of the other methods available, clinics attracted 70 percent of diaphragm acceptors (foams and jellies were generally purchased commercially) and 49 percent of

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1/ The correlation between income and education was high and the researchers selected to use the more complete and reliable data on education.

injectable users. Given Hong Kong's income levels and distribution, some proportion of the middle class is benefiting from the subsidized clinic program, and a significant proportion of acceptors prefer the clinic over private sources, especially for the IUD and diaphragm. The pill and condom are most often purchased at drugstores, where the wait is minimal. The one time costs of IUD insertions and diaphragm fittings apparently make clinic use worth the time and the income savings.

A number of studies in Brazil have included consumer preferences across sources (Morris et al, undated; Lassner et al, 1983). Table IV-3 shows sources of supply for oral contraceptives in five Brazilian states and Rio de Janeiro. All but Bahia have a free service community based distribution (CBD) program. In all but Piaui and Rio de Janeiro, over 50 percent of acceptors obtain their supplies from BEMFAM, the free service provider. In Bahia, Piaui -- where the program was only three months old at the time of the survey -- and Rio de Janeiro -- which has the oldest program -- private physicians and pharmacies met most demand.

In Rio de Janeiro the poorest selected to obtain their contraceptives from the BEMFAM program, but the other favela dwellers chose to purchase their contraceptives. In Piaui, the BEMFAM acceptors substituted the free product for the commercial one, indicating that these women were willing and

TABLE IV-3
SOURCE OF ORAL CONTRACEPTIVES CURRENTLY MARRIED WOMEN AGED 15-44
FIVE STATES IN NORTHEAST BRAZIL BY STATE (PERCENT DISTRIBUTION)

Source of Contraception	State and Year CBD Program Initiated					
	Rio Grande do Norte (1973)	Paraiba (1975)	Pernambuco (1975)	Bahia (-)	Piaui (1979)	Rio de Janeiro (Unknown)
BEMFAM/state health department	63.2	50.5	59.8	7.6	35.9	38.0
INPS*	1.6	0.5	2.6	9.6	2.4	--
Private physician/ clinic/pharmacy	33.6	48.0	34.0	81.7	58.9	61.0
Other source	1.6	1.0	3.7	1.1	2.8	1.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number of cases (unweighted)	(231)	(169)	(160)	(203)	(134)	(1729)

* Instituto Nacional de Prevedencia Social, Brazilian Social Security System

Source: Morris et. al., undated.

able to pay for contraceptives, but preferred to wait at clinics than continue purchasing on the market. It is also interesting that Bahia, with no subsidized program, has the second largest number of acceptors, implying that price may not be the constraint implicitly assumed by BEMFAM when it introduced free services.

Sri Lanka's (Abeywickrema, 1983) consumption patterns for oral contraceptives and condoms show that over 80 percent of condom users in both rural and urban areas rely on contraceptive social marketing outlets; for orals, 58 percent of women obtain them at government clinics, 32 percent at CSM outlets. Less than 10 percent of men and women obtain contraceptives from commercial outlets. The discrepancy between CSM and clinic sources for orals shows a preference (54 percent) for the latter among urban women, but an identical proportion of women use CSM and clinics in rural areas. Why this occurs is not explored by the author, but is contrary to what would be expected, since urban women are likely to have higher (cash) incomes, and a greater accessibility to both subsidized and commercial contraceptive sources. It may be that public programs are not as well or as consistently stocked in rural areas.

Another Sri Lanka experiment already discussed, was the vasectomy incentive program (de Silva and Abeywickrema, undated). One of the interesting facts about the incentive

program was the consistent socioeconomic profile of acceptors over the course of the price changes. Those earning under Rs. 500 per year represented the largest single segment of users across the three periods; those earning less than Rs. 300 represented 10%, 16% and 8% of users respectively over the three periods.

To try and explain the impact of the incentive payments, during October, 1980 when the incentive reached its peak, acceptors were asked why they had chosen this period to be sterilized. Fifteen percent said the incentive payment had drawn them, although most could not answer why. In response to a related question, 33 percent indicated that they would not have sought sterilization if the incentive had not existed. The negative price of the service clearly provided a strong incentive to sterilization. We know nothing of the access costs involved, but it is unlikely that they would have approached the Rs. 500 incentive payment.

Conclusions are difficult to draw from this disparate set of evidence. Except in Brazil (Lassner et al, 1983), India and Hong Kong, the data were not conducive to assessing the income group of beneficiaries, and none of them were meant to explain why consumers preferred one source over another.

We can say that low income groups appear to benefit from subsidized contraceptive programs; however, the subsidy is probably too large in many instances, encompassing couples who

are willing and able to pay without the subsidy. The information on consumer preference between public and private sources yields a similar conclusion: the subsidy net is thrown too wide, and those capable of using the private market often do not. However, when income rises significantly, as in Hong Kong, time factors become more important, especially for resupply methods, and reliance on public facilities dissipates. More work is needed in this area; in particular, data need to be collected that can address these questions directly.

E. Importance of Prices in Determining Consumer Intent

Determining whether costs of access or commodities affects utilization is exceedingly difficult based on existing information on contraceptive behavior. Despite the fact that behavior and intention do not always match (Hermalin et. al, 1979), a few efforts have asked women why they have not used or are not currently using contraception. These questions are noteworthy because of the total absence of cost or distance as perceived constraints to use.

Rodrigues et al (1981) asked previous users in three states of Brazil why they were no longer practicing contraception. Most gave reasons related to pregnancy and fecundity, but at least 20% in each state cited side effects and medical reasons. Neither costs nor access were mentioned. A 1980

survey in Bahia State, Brazil (Rodrigues et. al., 1980) asked women why they were not interested in the government's free services. None mentioned distance, inconvenience or waiting, but lack of confidence in non-medical personnel, side effects and preferences for not using contraceptives were the important reasons given. Lack of trust in free services was cited by less than 4 % as the reason for their disinterest.

In the same survey, however, cost represented the major deterrent to sterilization. Fifty nine percent of those interviewed indicated that the cost was the major reason for not seeking sterilization. This reason varied broadly by education: for those with no education 79%, less than primary 65% and greater than primary 28% indicated that high costs had prevented them from being sterilized.

Similar results emerged from the same survey conducted in Brazil's Southern Region (BEMFAM, 1983). Twenty eight percent identified the high cost as the major reasons for not seeking sterilization; less than 4% of non-using women in every education group cited cost as a reason for not contracepting at all. Under six percent of women whose last pregnancy was ill-timed or unwanted indicated that financial constraints were to blame for the pregnancy.

In conjunction with a contraceptive marketing survey for the CSM program in Mexico, 2,021 men and women from towns with greater than 2,500 people participated in a focus group

discussion of various demand-related topics, including costs (Folch-Lyon, 1982). The groups indicated that although price never determined the method of choice, variation in price across sources would determine where contraceptives were obtained. Sixty eight percent said they would frequent a free clinic over a subsidized or regularly priced commercial product. No additional evidence was reported concerning costs. Moreover, given the evidence provided above indicating a consistent preference for private sources where consumers are provided a choice of outlets, it may be that theoretical preferences and actual behavior diverge on this issue.

Whether the introduction of free services encourages those who have never used to begin contracepting, or whether it attracts those already using to switch suppliers, is important if the objective of free services is to assist low income couples space and terminate childbearing. The evidence on this point, however, is mixed and incomplete.

V. Cost Recovery in Family Planning Programs

As just discussed, user financing of family planning programs is predicated on consumer willingness to pay, and therefore on evidence that users do pay for family planning services. The access costs and price elasticity issues have already been considered. The actual contraceptive prices consumers face, the amounts households currently spend on contraceptives, and the cost recovery experiences of the recent past are also critical in estimating what level of cost recovery can be anticipated -- at least within the construct of existing family planning programs. This section discusses prices and pricing practices in LDCs, the affordability of contraceptives in developing countries, and the cost recovery experience in LDCs.

A. Consumer Contraceptive Prices in LDCs

Government/donor family planning programs have generally procured contraceptive commodities at low bulk rates, provided them free to family planning associations and allowed distribution at no charge. However, not all programs are currently free, as Table V-1 indicates. Prices for government provided contraceptives range from free for all contraceptives in a country like Morocco, to a high of $51.60 in Jordan for female sterilization. Across countries, orals are the most likely to be free,followed by condoms. Sterilization is

Table V-1

Cost of Contraceptives from Public-Sector Family Planning Programs[a] (1980 U.S. dollars)

Country	Oral Contra-ceptives[b] (per cycle)	IUDs[b] (device and insertion)	Condoms (per piece)	Diaphragms (device and initial fit)	Spermicides (per application)	Injec-tables[b] (per month)	Female Sterili-zation[b]	Vasectomy
Bangladesh	Free	.00-7.10	.00-.01	Not available	.00-.02	Free	Free	Free
Brazil	Free	Unknown	Free	Free(limited availability)	Unknown	Unknown	Free(limited availability)	Free(limited availability)
China, P. R.	Free	Free	Free	Unknown	Free	Free	Free	Unknown
Colombia	.04-.30	.00-3.30	.09	Not available	Not available	Not available	4.30-11.25	4.50-11.25
Dominican Rep.	Free	Free	Free	Not available	Free	Not available	5.15	1.00-45.00[c]
Egypt	.07-.26	Free	.05-.07	Not available	.02	Not available	Free	Free
El Salvador	.00-.40	.00-3.00	.00-.04	2.00	Unknown	.00-1.20	Free	Free
Guatemala	.25	1.00-5.00	.02	Unknown	.02-.04	1.25	.00-30.00	.00-10.00
Indonesia	Free	Free	Free	Unknown	Unknown	Free	0.00[d]	Unknown
Jamaica	Free	Free	.00-.05	Free	Free	Free	Free	Free
Jordan	.00-.34	.00-3.44	.09	Free	Not available	Not available	51.60	Unknown
Kenya	Free	Free	Free	Free	Free	Unknown	Free	Unknown
Korea, South	.16-.24	.00-2.83	.02-.04	Unknown	Unknown	Unknown	22.50	15.00
Madagascar	1.20	Not available	Free	2.43	.09	1.06	Unknown	Not available
Mexico	.00-.28	Unknown	.10	Unknown	.05-.09	Unknown	Unknown	Unknown
Morocco	Free	Free	Free	Free	Free	Not available	Free	Not available
Nepal	Free	Free	.00-.01	Not available	Free	Free	Free	Free
Nigeria	.58	1.55	.06	Not available	.09	1.96	Unknown	Unknown
Panama	.00-1.00	.00-5.00	.00-.08	Free	.09	5.25	25.00	Not available
Philippines	Free	Free	Free	Unknown	Unknown	Not available	Free	Free
Thailand	.00-.45	1.00	.02-.10	Not available	.06	.25	.00-7.50	.00-2.50
Vietnam	Free	Free	Free	Not available	Not available	Unknown	4.00-4.50	4.00
Zaire	Free[e]	Free[e]	Free	Free[e]	Free	Free[e]	42.25	Unknown

[a]Including publicly subsidized commercial retail sales programs.
[b]Prices may vary by brand, type of product, type of device, or type of procedure.
[c]Price depends on ability of client to pay.
[d]Not officially a program method, but government subsidizes privately performed procedures for some low income women.
[e]A fee of 3.55 is charged for a clinic visit.

Source: Shearer, 1983

generally the most costly form of contraception, as would be expected, but female and male sterilization are free in about 50%, of the countries in the Shearer (1983) study. Moreover, on an annual basis sterilization is no more costly than other methods. (See Table V-3).

Turning to private sector prices, Table V-2 lists the retail prices of available contraceptives in the same 21 developing countries for which public sector sources were reported. The relative costs of different contraceptive methods is reasonably similar within each country, with a few notable exceptions.

Although interesting, these data convey very little about the relative expense of contraception to users in LDCs since they are not tied to income levels. Moreover, other circumstances other than ability/willingness to pay determine contraceptive prices.

Often contraceptive products come under government price ceilings and other restrictions, and therefore do not reflect true market prices. Indeed, government price controls can effectively force the private sector out of the market or reduce its profits to the point where contraceptives are too costly to market very widely. Under the latter circumstances, private firms have the following options: 1) cross subsidize contraceptives; 2) produce a lower quality, cheaper product; or 3) abandon contraceptive marketing or restrict production and distribution to high volume, low cost markets (i.e., urban

US $?/yr?

TABLE V-2
Average Costs of Contraceptives
in Private Sector
of Selected Developing Countries 1/

	Female Sterilization	Vasectomy	IUD 2/	Oral Contraceptives (Per Cycle)	Condom	Injectable Per Month's Supply 3/	Diaphragm 4/
Bangladesh			46.15	1.28			
Brazil	1,061.25	481.25	327.5	.63	.24	1.72	69.90
Colombia	169.75	123.731	41.63	.80	.23	.72	--
Dom.Rep.	200.00	250.00	65.25	2.55	.29	2.29	27.50
Egypt	145.50	181.50	50.39	.46	.19	--	--
El Salvador	232.00	140.00	46.50	3.60	--	5.20	22.00
Guatemala	175.00	100.00	42.00	2.25	.33	2.83	---
Indonesia	120.00	24.30	30.70	1.38	.12	1.17	---
Jamaica	188.50	174.00	33.15	1.74	--	4.00	13.40
Jordan	404.20	301.00	113.26	1.23	.35	2.86	24.08
Kenya	---	--	48.91	3.54	.36	3.79	33.96
So. Korea	70.88	70.88	26.62	1.02	.11	--	---
Morocco	---	--	25.04	2.50	.17	--	---
Nigeria	---	--	65.04	6.98	.81	12.61	29.10
Panama	300.00	175.00	35.00	1.98	.25	6.00	---
Philippines	---	--	13.60	1.21	.19	1.56	---
Thailand	155.00	90.00	25.00	1.25	--	--	---
Zaire	88.75	--	60.41	3.55	.27	2.96	---
Madagascar	--	--	---	2.03	.48	2.82	---
Mexico	--	--	---	.41	.16	--	---
Nepal	--	--	---	.85	--	--	---

1/ Average is estimated as midpoint of reported range.
2/ Includes insertion and follow up visit.
3/ One month's supply is calculated on the basis of three months' effective action.
4/ Includes initial fitting and follow up visit, but not spermicide supply.

Note: Table Sums Sheatet (1983) Appendix Tables 1 and 2.
Source: Sheatet, 1983

areas). However, even with these options there are government restrictions. For example, cross subsidization of contraceptive products through higher prices on other pharmaceuticals is only an option if the producers have a monopoly on the pharmaceutical market and are also legally able to adjust product prices.

Recent experience suggests that when foreign exchange has become short, private firms have shifted out of low profit contraceptive products in such countries as Ecuador, Costa Rica (ICSMP, 1983) and Sri Lanka (Van Wie, 1982). In the Sri Lanka case, the National Family Planning Association filled the gap, and in Costa Rica, the growing contraceptive social marketing (CSM) program met local demand. Shrinking coverage tends to reduce options and supply sources in general, but the effects are likely to be severest in rural areas where distribution costs are highest and profits lowest.

As a result of the variation in production and distribution costs as well as in government pricing restrictions, there is a considerable range in annual cost of contraception from private sources, Table V-3 provides estimates of the annual resupply costs of contraceptives. On average, an annual supply of oral contraceptives costs around US$26.00; at a minimum, an annual supply of oral contraceptives costs around US$5.33 in Mexico, and US$5.98 in Egypt -- both countries have price controls for oral contraceptives (Cole et al, 1982; de la Macorro, 1984). Nigeria, by contrast, charges almost twenty times as much at

TABLE V-3

YEARLY RESUPPLY COSTS OF CONTRACEPTION OBTAINED THROUGH PRIVATE-SECTOR CHANNELS (1980 U.S. DOLLARS)

Country	Oral Contraceptives[a]	IUDs[b]	Condoms[c]	Spermicides[d]	Injectables[e]	Female Sterilization[f]	Vasectomy[f]
Bangladesh	16.64	--	--	--	--	6.59	2.03
Brazil	8.19	4[illegible].90	27.60	14.40	20.64	151.61	68.75
Colombia	10.40	18.45	27.60	--	8.64	24.11	17.68
Dom. Republic	33.15	26.10	34.80	27.60	27.48	28.57	35.71
Egypt	5.98	20.16	22.80	8.40	--	20.71	25.93
El Salvador	46.80	18.60	--	--	62.40	33.14	20.00
Guatemala	29.25	14.00	39.60	16.80	16.92	25.00	14.29
Indonesia	17.94	12.64	14.40	--	14.04	17.14	3.47
Jamaica	22.62	15.00	--	26.40	48.00	26.86	25.86
Jordan	15.99	39.12	40.80	31.20	34.32	57.74	43.00
Kenya	46.02	18.45	42.00	39.60	45.48	--	--
So. Korea	13.26	18.56	12.60	16.80	--	10.13	10.13
Madagascar	26.39	--	57.60	27.60	33.72	--	--
Mexico	5.33	--	19.20	13.20	--	--	--
Morocco	32.50	25.16	20.40	--	--	--	--
Nigeria	90.74	29.68	97.20	57.60	151.32	--	--
Panama	25.74	14.00	30.00	57.60	72.00	42.86	25.00
Philippines	15.60	9.79[g]	22.20	30.00	18.72	--	--
Thailand	16.25	--	--	8.40	--	22.14	12.86
Zaire	46.15	35.50	32.40	13.20	35.52	12.68	--
Average, All Countries	26.19	22.76	33.82	29.86	42.09	34.23	23.36

a Cost of supplies only; any prescription fees or medical examination costs not included.
b Includes cost of device, insertion, and (except for Nigeria), one follow-up visit and assumes an average use of 2.5 years.
c Cost of supplies only; assumes use of 120 pieces per year.
d Costs of supplies, diaphragm; assumes use of 120 applications per year.
e Cost of supplies only; includes both monthly and 3-monthly regimens; any prescription fees, medical examination costs or fees for injection not included.
f Includes all costs; assumes an average use of 7.0 years.
g Price includes only follow up, insertion cost is unknown.

Source: Shearer, 1983

US$90.34 per year. The discrepancy in IUD prices is less, ranging from US$12.64 in Indonesia to $49.00 in Brazil, but averaging $18.38 per IUD. Sterilization costs, especially for females, varies widely, from $6.49 in Bangladesh to $151.61 in Brazil. Average annual cost of any form of contraception is highest in Nigeria.

B. Annual Costs of Contraception for Consumers

Comparing annual costs with income conveys something about the average affordability of private contraceptive levels. Based on data for the countries in Table V-3, we can estimate the proportion of annual income required to purchase any single form of contraception for one year.

Table V-4 summarizes these data. For countries with per capita incomes over US$1,000, the per capita cost of private family planning sources appears affordable to mean income earners, generally averaging less than 5% of income for all contraceptive methods. Worldwide, IUDs and male sterilization appear to be the most generally affordable forms of contraception.

High retail prices in low income countries like Zaire, Bangladesh and Kenya may make contraceptives too costly for the average earner, much less the poor. For Nigeria, Zaire, and Kenya, most contraceptives are prohibitively expensive for all methods, with few exceptions. Indeed, costs to users appear

Table V - 4

PERCENTAGE OF INCOME REQUIRED TO OBTAIN ONE-YEAR'S SUPPLY OF CONTRACEPTIVES FROM PRIVATE-SECTOR CHANNELS BY METHOD

Country	Average Annual Per Capita Income 1979 (U.S. Dollars)	Oral Contra-ceptives[a]	IUDs[b]	Condoms[c]	Sperm-i-cides[d]	Injec-tables[e]	Female Steril-i-zation[f]	Vasectomy[f]
Bangladesh	100	16.6	--	--	--	--	6.5	2.0
Brazil	1,690	4.8	2.8	1.6	0.8	1.2	8.9	4.0
Colombia	1,010	1.0	1.6	2.7	--	0.8	2.3	1.7
Dom. Republic	990	3.3	2.6	3.5	2.7	2.7	2.8	3.6
Egypt	460	1.3	4.3	4.9	1.8	--	4.5	5.6
El Salvador	670	6.9	2.7	--	--	9.3	4.9	2.0
Guatemala	1,020	2.8	1.3	3.8	1.6	1.6	2.4	1.4
Indonesia	380	4.7	3.3	3.7	--	3.6	4.5	0.9
Jamaica	1,240	1.8	1.2	--	2.1	3.8	2.1	2.0
Jordan	1,180	1.3	1.5	3.4	2.6	2.9	4.8	3.6
Kenya	360	12.1	4.8	11.0	10.4	11.9	--	--
So. Korea	1,130	1.1	1.6	1.1	1.4	--	0.8	0.8
Madagascar	290	9.1	--	19.8	9.5	11.6	--	--
Mexico	1,590	0.3	--	1.2	0.8	--	--	--
Morocco	740	4.3	3.4	2.7	--	--	--	--
Nigeria	670	13.5	4.4	14.5	8.5	22.5	--	--
Panama	1,350	1.9	1.0	2.2	4.2	5.3	3.1	1.8
Philippines	600	2.6	1.6	3.6	5.0	3.1	--	--
Thailand	590	2.7	--	--	1.4	--	3.7	2.1
Zaire	260	17.7	13.6	12.4	28.1	13.6	4.8	--

a Cost of supplies only; any prescription fees or medical examination costs not included.
b Includes cost of device, insertion, and (except for Nigeria), one follow-up visit, and assumes an average use of 2.5 years.
c Cost of supplies only; assumes use of 120 pieces per year.
d Costs of supplies, diaphragm; assumes use of 120 applications per year.
e Cost of supplies only; includes both monthly and 3-monthly regimens; any prescription fees, medical examination costs or fees for injection not included.
f Includes all costs; assumes an average use of 7.0 years.

Source: Shearer, 1983

highest in the African countries.

The average annual cost of contraception is remarkably uniform across methods within countries, which is not surprising. A sharp divergence in the annual price of any method would be expected to result in strong consumer response and preference for lower priced methods.

Without knowing what percent of the market the private sector represents, the alternative sources of supply, and the income levels of consumers, we cannot identify the deterrence of price, or more importantly, the deterrence of high prices to contraceptive use by the poor. However, the foregoing does indicate that private contraceptive markets do exist in even the poorest countries.

The average annual costs of public and private contracepcives vary widely. Table V-5 shows the means and standard deviations for contraceptive prices across countries by method. Prices are clearly higher on average in the private sector. Differences in public prices are minimal (as indicated by low standard deviations) with the exception of condoms. Condom prices vary more in public than in private markets. Female sterilization prices have the highest deviation in both markets.

The degree of government subsidy appears to vary remarkably between the more permanent IUD and sterilization methods, and the resupply methods. Given the social returns of permanent methods, and of sterilization in particular, this subsidization

Table V-5

Means and Standard Deviations for Private and Public Contraceptive Prices by Method

Method	Private Price Mean	Private Price S.D.	Public Price Mean	Public Price S.D.
Female Sterilization	254.68	257.83	14.54	16.85
Male Sterilization	179.04	125.90	5.79	8.22
IUD	47.19	22.03	1.12	1.19
Orals	2.00	1.55	.19	.29
Condoms	.28	.17	.03	3.52
Injectables	4.15	3.79	1.63	1.90
All Methods	70.18	144.68	3.37	8.72

Note: See Table V-4 for annual cost calculations.

Source: Shearer, 1983

pattern makes sense. Moreover, for the poor, the private cost of sterilization is exhorbitant even when amortized over time. Subsidized services may be the only means low income couples have for obtaining sterilizations.

The relatively low standard deviations in public prices, suggest a possible uniformity of subsidies across public programs. The high deviation among private price levels presumably reflects relative local risks, competition, income levels, regulations, and other factors affecting transportation, distribution and marketing.

We have measured the percent of income needed to purchase an annual supply of contraceptives on the private market at the average market price. What percent of household income actually goes to family planning, and the proportion of local income needed to purchase a one years contraceptive supply -- whether or not contraceptives are subsidized -- are entirely different issues and are of particular relevance to equity concerns.

C. Household Family Planning Expenditures

Measuring household family planning expenditures is quite difficult using available data. Household surveys measure health or personal hygiene expenditures, and either category could include family planning expenditures. Admittedly these are imperfect measures since they include individuals who do not contracept at all as well as those using permanent

methods; however, the data are illustrative of what portion of income would be required to purchase contraceptives commercially.

In Nepal 2-5% of household income goes for health services (Barnum, 1982); Koreans spent 2% of 1973 income on health (Korea Statistical Yearbook, 1974). Jamaica's household survey found that on average households spent about 3% of income on personal hygiene, and it is estimated that somewhere in the neighborhood of 25% of that amount is spent on contraceptives, or less than 1% of total income (Howell and Seims, 1979). According to these data, family planning expenditures do not represent a significant portion of income in any of the three countries. Even if contraceptives were 50% of the households' health budget -- which is unlikely -- it would mean 1/2 to 2 and 1/2 percent of household income.

A preferable way of estimating the real costs of contraception to users is extrapolating from program information where local income levels are provided. At the McCormick Hospital in Chiang Mai, Thailand, annual family planning costs represented 2% of local income (at $155, local income is less than half the national per capita level of $350) for orals, injectables and sterilization. However, since this is a subsidized program, the actual costs would be 50 to 100% higher (Baldwin, 1978), or 2 to 4% of household income. In Meru, Kenya 57% of the

population earns $142 or less per year. A full years supply of condoms (120 pieces) at $.07 for three pieces would mean roughly 2% of household income (Black and Harvey, 1976).

A recent survey in the favelas (slums) of Rio de Janeiro, Brazil divided consumers into income groups, allowing estimation of the proportion of family income required to purchase contraceptives. At $1.00 per cycle of oral contraceptives, the lowest income group -- those earning less than $21.00 per month -- made up just over 14 percent of the favela population, and spent 4.9 percent or more of their income on oral contraceptives. The 33.8 percent of the population earning $21.00-41.00 per month spent 3.1 percent of their incomes for oral contraceptives. The remaining 52 percent of the favela dwellers had the highest incomes and expended significantly lower percentages of their incomes on contraception. Thus among the poor, contraceptives represent a relatively small proportion of income. However, it is worth noting that the poorest families in this sample were the most likely to use the subsidized, publicly provided contraceptives.

A less precise but nonetheless useful extension of this review is the percent of average national per capita income needed to obtain a years' supply of contraceptives in thePhilippines. Using the Philippines WFS -- which contained

contraceptive prices and annual contraceptive purchases, along with World Bank estimates of per capita income, average annual expenditures were calculated, and are reported in Table V-6.1/ Although not shown, the minimum price paid for any of these methods was zero, implying that government subsidized clinical programs were available; however, the average price paid suggests that everyone did not rely on free service programs; and on average, fees claimed 1.2% or less of mean annual income.

Based on the evidence just reviewed, contraception does not generally represent a large proportion of household income, even for lower income families; and for the better off, the costs are trivial.

D. Financing Public Family Planning Programs

Family planning programs have traditionally been supply driven investments, relying on reducing production costs and increased availability to improve effectiveness. Because the government subsidizes health care services to some degree in most LDCs, and drug supplies and distribution are often controlled, contraceptive services and distribution are first either added to the public health system, or established as independent family planning clinics. These clinic-based family

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1/ These data are of uneven quality, due to missing values, and the ambiguity of some of the questions (Pebley and Brackett, 1982).

Table V-6

Means and Standard Deviations of Contraceptive Method Prices in the Philippines WFS (Filipino pesos)

	Mean Value	Standard Deviation
Prices of condoms per year	7.10	22.39
Price of IUD per year	.88	2.52
Price of pills per year	4.08	11.62
Price of sterilization per year	4.58	7.83

Note: The World Bank's per capita GNP estimate for 1979 was $600 which at an exchange rate of 7 pesos to the U.S. dollar, would be 4,200 pesos.

pl. ning programs have recently been complemented by community based distribution (CBD) and contraceptive social marketing (CSM) programs.

The resource intensive CBD systems emphasize house-to-house information and contraceptive samples, and local resupply points for interested couples. Contraceptive social marketing programs (CSM), effectively use the commercial retail distribution system in delivering subsidized contraceptives. Clinic, CBD and CSM programs often exist simultaneously. The CSM efforts always generate revenues, the other two may or may not, depending on whether charges are imposed in their programs and how prices are set. Thus in terms of cost recovery, CSM is likely to have the broadest experience and the smallest deficits.

In addition to the government programs, a full range of family planning supplies, including abortion, have generally been available through private physicians, private hospitals/clinics, traditional health practitioners and, where legal, the local commercial market.

Presumably each of these sources serve a different segment of the market. Subsidized government programs are most often aimed at the underserved lower income groups, and certainly the modern private providers have catered to the wealthy through direct curative medical practices. The free family planning and CBD programs are targeted at the poorest groups, the

contraceptive social marketing at the lower half of income earners.

The actual financing of family planning programs in the developing world derives from a variety of sources, ranging from multilateral and bilateral assistance donors to government funding to voluntary donors to user fees. Lewison (1983) has detailed the country and institutional contributions.

In addition to government revenues and donor assistance, government family planning programs can be at least partially financed locally in three distinct ways: (1) reliance on volunteers; (2) establishment of non-family planning enter-prices to generate funds; or, (3) contributions of users, either through prepayment or fees. The latter two approaches require a certain degree of management and administration, which themselves pose constraints. Reliance on volunteers, while an option, will not be discussed here, because the viabi- lity of volunteer programs is often culturally determined, it is inherently an unstable financing method, and even if effec- tive, volunteers can at most only defray recurring labor costs.

Efforts of voluntary agencies in Bangaldesh (Pyle and Chowdhury, 1980) and Malaysia (Yusof, 1981) have successfully established income generating projects that at least partly cover costs of health and family planning services. Such

investments depend on competent and sufficient planning, funding, and management, talents already in short supply in the developing countries. Moreover, government policies can inhibit the establishment and/or success of such efforts. Thus side investments are probably not a practical alternative to resource needs in family planning programs, except under special circumstances.

Insurance schemes, while useful revenue sources for health programs are less appropriate for family planning services since the main benefits of pre-payment are to cover contingencies and distribute risks among subscribers. Adding family planning to existing prepayment health programs is potentially a promising method of user payment. Two ongoing A.I.D. experiments, one in Bolivia and the other in Kenya, are adding family planning services to company health programs to test the feasibility of adding contraceptive services to employee health insurance. But no evidence is yet available on the cost effectiveness of these experiments.

User payments offer a less complex and more flexible approach to raising funds for sustaining or expanding family planning programs. User payments are already the most common method for recovering costs in LDC family planning programs. It is this experience that is reviewed here.

E. Cost Recovery Experience in LDCs

Even where incomes are low, some level of cost recovery is feasible. Evidence from health programs in Nepal (Barnum, 1982) and Bangladesh (Pyle and Chowdhury, 1980) suggest that charges can be levied for health and family planning projects, even in the poorest countries. About 10 % of costs were recovered in both the Nepal and Bangladesh programs just cited. In Bangladesh, for those who could afford to pay, admission to the clinic cost $0.16, and treatment required a donation of rice valued at $1.03. Prices for the Nepal program are not available.

LDC family planning program experience with cost recovery is outlined in Table V-7. Cost recovery in family planning programs tends to hover just below 50 percent; but, because imported contraceptive costs are generally borne by donors and represent about 50% of total costs, the real contribution is closer to 25%. However, the McCormick Hospital program in Thailand (Baldwin, 1978), Sri Lanka's CSM effort (Abeywickrema, 1983) and Colombia's CSM system have all generated 58% or more of total costs, including the costs of commodities.

Cost recovery estimates often meet a smaller proportion of total costs than that reported, since contraceptive commodity costs and the related distribution, logistics and packaging

costs are rarely considered. In general, adding family planning services to ongoing health programs further reduces the reported costs of the operation, because joint production costs are incorrectly accounted for (i.e., the fraction of fixed health program costs are not attributed to the family planning effort). The studies cited in the table do separate out family planning costs, however.

Contraceptive Social Marketing: CSM provides the most extensive cost recovery experience in the LDCs. Because CSM efforts build on existing networks and distributor lines, sufficient economic incentives are built into programs to attract and maintain local retailers and suppliers. Profits are generally tied to product price, and often dealer and distributor profits are dictated by law or competition. As already mentioned, CSM prices are a function of local ability to pay, local costs of doing business and, in some instances, price regulation.

The specific operating methods of CSM projects vary greatly by program. For instance, the extremely successful CSM program in Colombia purchases contraceptives at wholesale prices from Schearing, an international commercial firm, and competes with the private sector in distribution. High volume and efficient business practices have resulted in significant revenues. In India, the Nirodh condom is purchased by the government, and as a public service various distributors arrange marketing through

their existing channels. A third program in Nepal originally had the government covering the costs of contraceptive commodities as well as the wholesale distribution to retail outlets. The government subsidy is currently being phased down and the private sector is taking over.

CSM subsidies generally cover contraceptive commodities, advertising, and the additional costs associated with reaching the smaller markets outside profitable urban areas, as was the cast just cited in Nepal. Private contraceptive providers rarely advertise, due to national sensitivities toward family planning issues (in some cases it is prohibited by law) and/or the high costs of advertising relative to the returns on contraceptive sales. Low demand and incomes in more remote areas, combined with the higher costs of distribution, make rural areas less attractive to profit making firms. Hence supplies will not reach the low income target groups unless efforts are made to make contraceptives available in rural areas. The CSM has effectively harnessed the existing distribution system for reaching these areas and subsidize distributions and users sufficiently to make the system function.1/

1/ Good examples of the need for CSM are Nepal and Bangladesh. In both countries, private sources of supply are only marketed in the major urban centers, the rural areas rely almost exclusively on CSM and, in the few areas that have them, public facilities. Subsidies are mandatory if these programs are to reach the underserved in remote areas.

Cost Recovery Comparison among Distribution Methods: Data on the extent of governments' contribution to contraceptive commodity and distribution costs is spotty. Based on the documented experiences summarized earlier in Table V-7, subsidies range from a high of $18.70/CYP for orals in Colombia's rural CBD program to a $1.03 profit per CYP in Colombia's CSM program. Given the efficiency of Colombia's Profamilia program, the high costs of the CBD effort probably represent the lower end of the cost scale for reaching remote areas in any LDC. This suggests that CSM programs are best able to recover costs, which is to be expected given the cost recovery orientation of these programs.

The relative cost recovery potential of various family planning approaches can be best seen by the Colombia program. Comparing clinical, social marketing and CBD (rural and urban) cost recovery records for 1980/81, CMS covered 126% of costs, the clinical program covered between 20 and 28% of costs, and the CBD covered 50% of urban and 17% of rural costs. The labor intensive CBD is the most heavily subsidized program. The CSM program produced an impressive cross subsidy for some other aspect of the family planning system, demonstrating the potential for generating revenues and recovering a significant portion of total costs. No other program produces a profit or approaches covering total costs.

TABLE V-7

Family Planning Costs, Cost Recovery and Subsidies by Method in Selected Developing Countries
(US$)

Country (Source)	User Price by Method	Percent of Costs Recovered 1/ (First)	(Last)	Net Project Cost by Method (First)	(Last)
Nepal CRS (Barnum, 1982)	Condom=$.05 for 3 Oral Cycle=$.08	10% recurrent costs; 8% total costs (1981)		$11.80/CYP 2/ $12.14/CYP	
Colombia 3/ (Ojeda, 1982)	IUD Oral Cycle $.46 4/ Sterilization 5/	20% 8.7%	20% 27.8%	(all per CYP) $15.27 $2.18	
Clinical CBD	Orals	46.4% 10.2%	50.4% Urban 17.0% Rural	$4.09-$3.42 $22.75-$18.70	
CMS	Orals	117%	126%	-$.72-1.03 5/	
Sri Lanka CRS (Abeywickrema, 1983)	Orals =$.13-$.18/cycle 6/ Condoms = $.5-$.78 for 3 $.4 for 2 $.18 for 4	98% of recurring costs			
Kenya CRS (Blake & Harvey, 1976)	Condom = $.07 for 3	57%			
Thailand CBD (Chen & Farley 1981)	Condom = $.05@ Pills =$.25/ $.35/ $ 45	52% (FY77)	26.3% (FY80)	$7.87/CYP or $10.07/CYP including contraceptives	
Thailand (Family Health Division, 1983)	Injectable = $1.05	50%			
Thailand, Chiang Mai (Baldwin, 1978)	Injectable= $.75@ Orals=$.25/cycle 7/ IUD = $2.50 Sterilization = $15/operation	50% of total costs, incl. contraceptives and capital costs			
India CRS (SFP #6, 3/1965 Ford Fdn, 1969)	Condoms=$.061 for 6	12.3% of total costs over first 5 years.			
Taiwan (SFP #6, 3/1965)	IUD $1.50	50%		$2.50/loop inserted	
Jamaica (Howell & Seims, 1979)	Orals=$.17 Condoms=$.09 for 3	Orals 42% Condoms 60%		$4.85	

1/ Many of the experiments reported here measured cost recovery at the beginning of the project and then again after it had been in operation for some period. First and last refer to cost recovery at the first monitored period and the latest period.
2/ Excludes cost of short term resident U.S. contractor.
3/ Prices include costs of contraceptive commodities.
4/ Price obtained from ICSMP, 1983.
5/ Costs of laparoscopies not included. Negative project costs reflect profit generation of Colombia's CMS program.
6/ Multiple prices reflect diversified products.
7/ Represents about 10% of commercial costs of a single cycle.

Cost comparisons across family planning programs is exceedingly difficult given the wide variation in accounting procedures and the spotty data on actual costs. Gillespie et al (1981) attempted a summarization of existing work on the cost effectiveness of alternative programs. Few conclusions could be drawn except that the deficiencies in existing studies were severe.

Available evidence on CBD programs is sparse, although some experiences are relevant. The already cited Colombian study found the rural CBD program to be the least cost effective method for raising contraceptive prevalence. In a recent Rio de Janeiro study, Lassner et al (1983) found that the CBD program raised knowledge, but not contraceptive use.

The experience in Piaui, Brazil (Morris et al, undated), where subsidized CBD contraceptives became a direct substitute for the majority of private sources, suggests an oversubsidization of current users. Moreover, the resource intensive home visits may well have been unnecessary.

The question of whether CBD is a most cost effective means of raising contraceptive use has not really been carefully considered. For instance, could an alternative such as an advertising campaign or other method of consumer education have achieved the same effect at a lower cost? Although Gillespie et al (1981) and others have attempted to answer this question,

the lack of appropriate experiments and/or data have thwarted their efforts. But it is an issue of central importance to resource allocation decisions across programs, especially where cost recovery is desirable.

Cost Recovery in Private Voluntary Organization Programs: Another experience worth noting is the cost recovery of small private voluntary programs. Although more relevant to the standard urban family planning clinics than to rural areas. The experiences reported here are instructive. The Population Crisis Committee has provided small seed grants and loans to small family planning efforts of voluntary organizations in two LDCs. The 1979-80 India loan of $46,000 for establishing two family planning clinics charged 10% interest over four years with a one year grace period. Repayment is on schedule and generated entirely by fees; abortion being the most important source of revenue. In Cameroon, a $2,000 grant in 1980 added injectables to the services of a local hospital in Yaounde. User fees have sustained the resupply of Depo Provera for the past three years. Both of these investments were for private family planning programs, and not established as government supported institutions (Huber, 1983). The profit motive and the self sustaining nature of the programs from their inception aided revenue generation, in a manner similar to CSM programs.

The McCormick Hospital program in Thailand is an excellent example of a largely self supported family planning effort. Fifty percent of total costs are covered by user fees, and price increases have not had much of an effect on demand. Moreover, the program serves lower income households, who by their participation have demonstrated an ability and willingness to pay for contraceptives. Although subsidized, this PVO effort both reaches its target population and partially supports its program through user contributions.

If government programs could adopt similar operating objectives and introduce market principles, cost recovery might improve. However, it is an approach requiring careful testing before any definitive guidance can be proposed.

F. Cost Recovery Issues

Two separate issues relating to cost recovery potential bear mentioning. First the administrative and management costs of collecting and disposing of revenues can be costly. Indeed, high administrative costs led to the abandonment of fees in Thailand's rural family planning program (Knodel, et al, 1983). Moreover, programs which charge fees often must turn revenues over to central programs, reducing collection incentives as well as incentives for workers to provide quality care. Workers or clinics that can retain at least some of the collected revenues have an incentive to produce and ensure a

return clientele. This was the case in the Colombia family planning program. The need to motivate public health providers in family planning programs has been recognized as a serious impediment to program efficiency and success (Cuca and Pierce, 1977), but it is not always recognized as a cost to programs. Costs rise with inefficiency, and reducing those difficulties will work to raise cost recovery.

The second issue of particular importance to public family planning programs, is how the poor can be accommodated in efforts to increase cost recovery. Although based on paltry evidence, expenditure on contraceptives appear to represent between 2 and 4% of incomes of the poorer families in developing countries, not counting access costs. Do the lower income earners, those in the last decile or two, want to contracept, especially in the least developing countries? Available data lump the lower quarter or half of income earners together, making the question impossible to answer. It is likely that demand at that level may be minimal. If so, then the poor needing subsidies range anywhere between the 9th decile and, say, the 2nd decile, or the lower 60%, not counting the lowest 10%.

What is this group able and willing to pay? From the assembled evidence, they appear to be willing to pay something, but demand appears to be sensitive to price only above a certain level (See Section IV). Measuring price elasticity or

testing alternative prices, as the Taiwan program did (Cernada, 1982) is a useful means of ascertaining appropriate prices, and determining the financial burden on low income households. Concurrent household surveys or contraceptive prevalence surveys pinpointing the income of beneficiaries would measure what the poor are able and willing to pay. With this information the equity issue could be more systematically addressed. Given current data limitations, little can really be concluded other than that the poorest countries (e.g. Nepal and Bangladesh) and poor sections of LDCs (Meru, Kenya and Chiang Mai, Thailand) do recover some costs, albeit not a large proportion of costs. Moreover, the evidence on quality and price relationships discussed earlier suggest that the poor prefer to pay, and are willing to consume a lower quality product sold at a lower price, as was found in India (Mohammed, 1969).

If the poor are excluded from obtaining contraceptives because of high prices, governments can easily target subsidies, either through lower quality goods and/or direct subsidization, which only reach this unserved group. The merit good argument -- that lower quality goods will only attract the needy, thereby effectively targeting programs/goods to the poor -- applies here, and the India experience just cited is a working example (Lewis, 1981).

Direct subsidization of family planning use, based on proof of income has been attempted in numerous programs. The Thai government (Family Health Division, 1983) policy, for instance, does not charge the "poor," nor did the programs reported by Pyle and Chowdhury (1980), but enforcing definitions and ensuring appropriate implementation is difficult and potentially costly. This constraint also applies to programs with prices tied to a sliding scale of income. However, no sound evidence exist on how workable the approach actually is.

F. Prospects for Cost Recovery

The foregoing discussion suggests that cost recovery at some level is possible. A number of programs in LDCs have shared costs with users; moreover, lower income households have purchased and benefited from the partially subsidized public and private contraceptive programs.

The evidence earlier in the section on price elasticity suggests that prices are often too low, and where programs have taken the plunge and raised prices, demand has remained stable or risen. Thus programs in Sri Lanka (Abeywickrema, 1983), Jamaica (Howell & Seims, 1979), Colombia (Ojeda et al, 1981), and Thailand (Baldwin, 1978; Family Health Division, 1983) have specifically raised contraceptive prices and generated additional revenues, while maintaining utilization rates. However, it should be kept in mind that the level of subsidy

was only reduced, not eliminated, so the full cost was not passed on to users.

Moreover, when prices were decreased demand also rose. A further potentially valuable method for maximizing cost recovery and maintaining low income clientele is market segmentation. The Nirodh model in India and the multiple products available in Sri Lanka's CSM program suggest that dividing up the market can minimize subsidies and attract a range of income groups.

Further documented experiments will be required to define the best means for simultaneously promoting cost recovery and assisting couples plan their families. The evidence provided here merely suggests that cost recovery is possible. We still do not know what the optimal price should be, that price which will maximize revenues and minimize clientele loss. However, addressing this issues will be critical to efficient cost recovery efforts in the future such as family planning programs.

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96