1997

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Technical Paper 10

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September 1997

BACKGROUND

The injectable contraceptive DMPA was introduced by the manufacturer Pharmacia-Upjohn in the private sector in India in 1993. Introduction was approved by the Drug Controller of India, contingent on the completion of post-marketing surveillance study of users. MaxPharma, the Indian pharmaceutical distribution company, developed a conservative marketing strategy, establishing the wholesale price of DMPA at Rs. 95 (about US$2.66). Thus, the commercial price of a dose of DMPA is about Rs. 150-180, exclusive of the fees of the medical provider. This price puts it beyond the reach of most Parivar Seva Sanstha (PSS) clients in need of safe and effective family planning services in Uttar Pradesh. DMPA is currently not available in the public sector outside of the sites involved in the post-marketing surveillance study. Several donors have offered to provide supplies, if it were to be approved for public sector distribution. UNFPA provides donations of DMPA to the public sector programs in neighbouring countries of Bangladesh, Nepal and Pakistan.

Product price is one of the major factors affecting adoption and continuation of contraceptives. Evidence from a 1986 review of 15 experimental programs suggests that charging a modest fee for contraceptive services and products (rather than providing them free) does not have a negative effect on demand. However, efforts designed to recover the full costs often deter low-income and moderate income clients from seeking the service. Similarly high prices dampen sales and tend to shift users to other sources or less expensive methods (Lewis, 1986). The costs of providing services is another important issue for sustainability.

PSS is a registered NGO, affiliated with Marie Stopes International, and operates 31 clinics throughout India. All PSS clinics provide a wide range of family planning and gynaecological services, including ante-natal care, family planning, MTP services, and treatment of gynaecological morbidities. DMPA was introduced to PSS clinics gradually from August 1994 through March 1996. PSS is one of the organizations participating in the post-marketing surveillance study, for which it provides the product at no charge in Mewat, Rajasthan. DMPA is simply one of the contraceptive options available.

At PSS contraceptives available in the public sector, e.g. Nirodh condoms and Mala D orals, are provided free of charge. Social marketing products are charged at the following rates: four **Bliss** condoms for Rs. 6, four **Sawan** condoms for Rs. 4, and one cycle of **Ecroz** for Rs. 6. There is no charge for a copper IUD, although a gynaecological exam is charged at Rs. 40. Both female and male sterilizations are provided free, and the government sanctioned user fee is paid to clients to cover expenses of Rs. 145. MTPs are charged on a sliding rate depending on the number of weeks of pregnancy, e.g. 6-8 weeks, Rs. 375, or Rs. 475 for 10-12 weeks.

Since April 1996, an experiment is underway with three clinics of Parivar Seva Sanstha (PSS) in Uttar Pradesh to study the effect of price on demand for DMPA. The study seeks to better understand the issues of service delivery, client profile and the price at which the service can be offered in a sustainable way. Since April 1996, PSS has charged clients selecting DMPA Rs. 50 in Agra, Rs. 100 in Lucknow, and the product is offered free in Varanasi. All other PSS clinics in India offer the product at Rs. 50. In all sites, a gynaecological charge of Rs. 40 is added during the first visit, and Rs. 20 for visits for continuing users of DMPA.

OBJECTIVES

This cost analysis has two main objectives:

- To estimate the cost of providing DMPA services at three clinics in three cities in Uttar Pradesh.

- To analyse the price at which DMPA services can be sustainably offered given the cost structure at each clinic.

METHODOLOGY

DMPA services have been offered since 1994 at functioning PSS reproductive health clinics providing a range of services, from family planning counselling and service, gynaecological checkups to abortions. The analysis presented here estimates the marginal cost of adding DMPA services to three fully operational urban clinics (Agra, Lucknow and Varanasi) in the state of Uttar Pradesh. Thus start up costs (e.g. building and capital costs), and indirect administrative costs (to support the program activities of the organization) are not considered in the analysis. Marginal costs are critical from a local manager's perspective as they are directly relevant to decisions to adopt innovations such as a new service or a new product.

The methodology used in this analysis was developed by the Association for Safe and Voluntary Contraception (AVSC, 1996). Other cost analysis methodologies are available (e.g. Janowitz and Bratt, 1994), but the AVSC process seems most easily adaptable to the PSS clinic setting. The select costing method estimates the cost of staff time and supplies used in the provision of DMPA services, to reach overall estimates of costs and revenues associated with a particular service. The service delivery process is broken down into a series of tasks or activities, and the staff time and supplies expended on each activity is measured by observing the staff perform each activity. For calculating staff costs, the methodology counts the minutes spent by a client with each staff and multiplies it by the value of staff time. Similarly supplies such as cotton, alcohol, needles and syringes used in service delivery are also costed.

The list of activities the staff perform during DMPA service delivery are: information provision on all contraceptive options, counselling for DMPA, medical examination, administration of DMPA, counselling for the management of side-effects of DMPA, and administrative record keeping. Counselling is a continuous process at PSS, with several staff responsible for listening to clients concerns and providing information and feedback to the client. For example, both the counsellor and physician may provide DMPA counselling to the same client.

Costs can be classified into fixed and variable costs. Fixed costs are clinic costs regardless of the numbers of clients served such as the salaries of the clinic staff providing the services and promotional activities to popularize the method. Variable costs on the other hand are directly related to the numbers of clients served and include the costs of medical supplies, clients forms and laboratory tests if required. As the analysis is based on the measurement of the value of each activity undertaken, the fixed and variable costs are not mentioned explicitly but are subsumed in each of the activities observed. Any cost that were specifically related to the research process, such as follow-up interviews, printing of questionnaires and interviewers were not included in the costing exercise.

Clients who visit the clinic are classified into four categories: first time DMPA users, continuing users, those seeking relief from DMPA related side effects, and those seeking information on DMPA. As the needs of each category of client differ, each is offered a slightly different package of services, causing variation in the staff time and supplies used.

Data were collected from the three clinic sites at Agra, Lucknow and Varanasi as well as the PSS head office in New Delhi. The data corresponds to that available in March 1997, when direct observation was conducted and from analysis of client records from July 1996 to December 1996. Clients who had sought any of the DMPA services on the day of the visit were observed as the service was provided. If however, no clients could be observed at a clinic day, the researcher played the role of a client and the staff role played the service provision. It is possible that some of the staff were influenced by knowing the identity of the researcher and thus spent a greater amount of time than normal on the activity. However, this type of bias is minimal as direct observation suggests that the same quality of care was provided in handling clients who had come for other services.

Further, the clinic visits were conducted on busy clinic days leaving staff with little inclination to overspend time on the activities which were role played. Minimums and maximums were estimated where there was variability in the observations or where several options were potentially possible, e.g. cost of DMPA supplies. While direct observations of services in the clinics were used as the basis for estimating costs whenever possible, sometimes informed estimates from staff were used as the basis of cost and time estimates (minimums and maximums). This was due to the large variability in individual client needs and relatively small number of clients visiting a clinic for DMPA services during a given week. A sensitivity analysis was conducted at the end of the exercise to determine if the conclusions of the study would be modified by changing prices, or altering components of the service and promotion package (e.g. with or without advertising).

RESULTS

I Cost Estimates per Client

In this section we describe the various activities which are performed when clients seek DMPA information and services. There are four types of clients: (a) those seeking information on DMPA; (b) first time DMPA users; (c) continuing users; and (d) users seeking relief from side effects of the DMPA. As each of these clients is provided with different services, the activities are described according to the type of client served.

Each clinic is staffed by almost the same number of providers which consist of a manager cum counsellor, two to three female gynaecologists or general physicians with a women's health background, three to four paramedical staff including a sister in charge, staff nurses, an operation theatre attendant, and a cleaner. In most clinics counselling is done by the manager and the physician, and the medical exam by the gynaecologist. DMPA is administered by a nurse, and record maintained by the counsellor and cleaning by the cleaner. However, there are some site to site variations in the individual responsible for each activity and the time taken to perform it. The particulars are given below.

A. New DMPA User

Registration

Registration is normally done by the manager cum counsellor of the clinic. As with all users of PSS facilities, a new DMPA user is first registered in the daily intake register by the counsellor. A patient slip is filled in at this time which indicates to other staff handling the patient what services the client has come for.

Registration Time

Registration	Agra (in minutes)	Lucknow (in minutes)	Varanasi (in minutes)
Counsellor/Manager	1	1	1

Counselling

After registration, the counsellor provides information and orientation to the client on the range of family planning methods available at PSS, including DMPA. DMPA is simply mentioned as one of the options available during counselling. At least one chart in each clinic identifies the methods available. Information on how each method works, the duration of effect, and its advantages and disadvantages is provided. Further the counsellor also discusses with the client her/their specific needs. Counselling time in the clinics varies from 6 to 20 minutes. As DMPA is a new product in India, it is often explained in greater detail than other more well known methods. However, significantly less time was spent on counselling, both at the time of intake and during the medical examination, in Varanasi compared to the other clinics. If the client is interested in using DMPA, a DMPA client card is filled by the counsellor and the informed consent is signed by the client. This card contains brief biographical information of the client, her parity and contraceptive history, and her medical history. In some clinics, the client card is filled by both the counsellor and the gynaecologist.

Counselling Time

Counselling	Agra (in minutes)	Lucknow (in minutes)	Varanasi (in minutes)
FP counselling	10	10-15	3
DMPA counselling	7-10	10	3-5

Medical Examination

After the client card is filled, the client proceeds to the doctor for a medical examination. As the client is a first time user, the doctor counsels the client once again about DMPA and answers any queries that the client may have. Then she takes down the medical history of the client including menstrual patterns, presence of jaundice, diabetes, heart ailments, allergies, and medication. A physical exam is

also conducted which consists of a breast exam, chest auscultation, abdominal checkup and measurement of pulse, weight and blood pressure. Bimanual and per speculum vaginal examinations are also conducted to check the condition of the vagina, cervix and uterus. These activities take from 10 to 15 minutes. In a small proportion of cases, the doctor may recommend that a pregnancy test or a haemoglobin test be done. Generally the pregnancy test is recommended if the client is still amenorrhoeic and the clinical exam is not conclusive. Paramedical staff conduct both the pregnancy and haemoglobin tests at the clinic itself. All first time DMPA clients are charged Rs. 40 for a gynaecological checkup in all the three sites. In this analysis, we are not costing the pregnancy tests and the haemoglobin tests as these are performed on less than 5 percent of clients attending all the three clinics.

Medical & Gynaecological Examination Time

Medical Examination	Agra (in minutes)	Lucknow (in minutes)	Varanasi (in minutes)
Counselling	5	5	3
History	5	5	3
Physical	5	5	2

Charging for DMPA Services

DMPA services are offered at three different prices at Agra, Varanasi and Lucknow. First time users at Agra are charged Rs. 90 (Rs. 40 gynaecological fees plus 50 for DMPA), at Lucknow Rs. 140 (Rs. 40 gynaecological fees plus 100 for DMPA), and at Varanasi Rs. 40 (Rs. 40 gynaecological fees plus Rs. 0 for DMPA). The clients usually tender the service fees for DMPA administration to the Manager of the clinic.

Administration of DMPA

If the doctor finds the client fit for DMPA, she is then administered the injection by one of the nurses. The paramedical staff normally shake the injection vial thoroughly, then load it into a glass syringe with a disposable plastic needle. After the injection site is cleaned with alcohol, DMPA is administered. A standard protocol is used for administration as an intramuscular injection in the upper arm.

DMPA Administration Time

Administration	Agra (in minutes)	Lucknow (in minutes)	Varanasi (in minutes)
DMPA injection	7-10 (includes BP and weight measurement)	3	3

Scheduling Follow up Visits and Record Keeping

After administration, the date of the subsequent injection is entered on the client's follow up card. The follow up card is given to the client and she is informed about the date of her return for the next injection. She is also reassured that she can return anytime should she require consultations. Client data and clinical information is also recorded in the DMPA register. It contains information such as the client's name, identification number, date of injection and dose number, and a medical history. This register is filled during counselling and completed as soon as the client has been provided the injection. Some clinics also maintain a second register which is a running register of DMPA users. This activity is undertaken by either the counsellor or the nurse in all the clinics.

Record Keeping Time

Recording	Agra (in minutes)	Lucknow (in minutes)	Varanasi (in minutes)
Schedule follow up	2-3	1	1
Fill DMPA registers	3-4	2	2
Take payment	1	1	1

Daily Clinic Tasks

Other daily clinic activities such as cleaning and preparing rooms and equipment though important are not costed in this analysis, and are considered part of the organizational infrastructure of a functioning clinic. Usually the paramedics and the cleaner undertake this task. Disposable needles are thrown away with the rest of the waste material generated at the clinic. Syringes are sterilized in an autoclave and records are filed in binders.

B. Continuing User

A continuing user who does not report any side effects is provided with a medical consultation, DMPA, and registered for the next dose. The specific tasks and their duration, and individuals responsible for them are the same as listed above. There is variation by clinic in the type of medical exam conducted. In some sites, the doctor conducts a thorough examination including pulse, blood pressure and weight measurement, bimanual and per speculum examinations. This is done as doctors feel that DMPA is a new service and they would like to monitor the clients on a regular and standardized manner.

A continuing user is charged Rs. 20 for the gynaecological checkup at all the three sites during fiscal year 1996. Continuing users at Agra are charged Rs. 70 (Rs. 20 gynaecological fees + Rs. 50 for DMPA), at Lucknow Rs. 120 (Rs.20 gynaecological fees + Rs. 100 for DMPA), and at Varanasi Rs. 20 (Rs.20 gynaecological fees + Rs.0 for DMPA).

C. Clients with Side Effects

In all the three clinics, very few users visit just for the management of side effects. Those with side effects appear to drop out by not returning for the next injection. There is little if any follow-up of clients who do not return to the clinic. Few have telephone numbers and many would not like PSS staff to visit their homes. Clinic personnel infer that side effects such as menstrual irregularities could be the reason for the non appearance of some clients. In other sites the distance of the clinic from the home of the client appears to be a constraint. However, when clients return to the clinic for the next dose of DMPA, some do report side effects to the counsellor and doctor. In such cases, the client is counselled, examined by the doctor and prescribed medication if required. Details of each of the three activities are given below. Clients are not charged any fees for consultations for side effects associated with DMPA use. Clients of any method coming to PSS for a gynaecological check-up for suspected morbidity would be charged for the medical consultation.

Counselling

The counsellor discusses with the client about the nature of the side effect and how they could be handled. The clinics indicate that most women reporting side effects complain of amenorrhoea and spotting. In some rare instances, clients have also reported continuous bleeding. If the side effect is a well known side effect such as amenorrhoea or spotting, the counsellor reassures the client that these are normal. Estrogen pills are temporarily prescribed for those concerned with spotting, as this should cease by the second or third dose. She is informed that amenorrhoea may continue, but this does not mean the woman is pregnant. Any other queries posed by the client are also handled at this stage.

Medical examination

Next the client is attended to by the doctor. A full physical examination as given above is done. If the side effects are minor in nature the doctor reassures the client. If the side effect is irregular menstrual

bleeding, the doctor may prescribe hormonal treatment to regularize the bleeding. The client is asked to return if the symptoms do not improve.

D. Information Seeking Client

As DMPA is a new product there is considerable interest in it. Consequently the staff respond to enquiries on the telephone, through letters and enquiries in person. Two types of IEC material have been prepared to handle such queries: one pamphlet is designed for clients in both Hindi and English addressing the most commonly asked questions; the second type of material is designed for medical practitioners and Registered Medical Practitioners (RMPs). Enquiries through letters and in person are provided these IEC material. As not all information seekers accept the method they are classified differently from those who seek information and accept DMPA as well.

On average each of the three clinics has been responding to 2 to 10 letters per month, 30 telephonic enquiries per month and about 15 to 20 counselling sessions for clients interested in DMPA. Provision of information is handled by the manager cum counsellor. At the present moment it is too early to estimate the proportion of potential clients of all information seekers.

Type of Enquiry	Agra (in minutes)	Lucknow (in minutes)	Varanasi (in minutes)
Telephone enquiries	3-5	3-5	1
Postal enquiries	1	1	2
In person enquiries	10	10	2

II Supplies for DMPA Service

As DMPA is being provided in a functioning reproductive health clinic few additional types of supplies are required. The supplies used to conduct each of the activities are specified below. For recording purposes: registers, a client consent form and patient slips are used. IEC material on the DMPA available in both English and Hindi are given to clients; additional information materials are provided to physicians potentially interested in referral; non disposable gloves and speculums are used in the medical examination, while the administration of DMPA requires alcohol, cotton wool, a disposable needle and glass syringe. PSS pays from Rs. 95 to Rs. 110 for each vial of DMPA. The lower price is charged in direct purchases from Pharmacia-Upjohn, while the higher price is charged on wholesale purchases in Lucknow. See Annexure for the cost estimates of the supplies used in the analysis.

III Annual Cost per Type of Client

Table 1 presents the estimated cost of serving a single client at each of the three sites--Agra, Lucknow and Varanasi. The estimate includes the cost of both the time and supplies used to provide the service. A range is provided in the estimates to account for variations in quantities of resources used.

Table 1
COST ESTIMATES FOR DMPA PER TYPE OF CLIENT

(In Rupees)

Type of client	Agra		Lucknow		Varanasi	
	Min	**Max**	**Min**	**Max**	**Min**	**Max**
A. New client						
Client Registration	0.56	0.74	0.56	0.74	0.56	0.74
Counselling	16.18	26.34	19.52	26.27	12.23	16.63
Medical Exam	12.76	21.50	12.76	21.50	5.88	14.46
DMPA Administration	98.57	119.11	97.32	114.74	97.32	114.74
Record keeping	3.24	5.88	2.31	3.21	2.31	3.21
Total	**131.31**	**173.56**	**132.46**	**166.45**	**118.29**	**149.77**
B. Continuing user						
Client registration	1.05	2.03	1.05	2.03	1.05	2.03
Medical Exam	5.12	12.44	5.12	12.44	3.59	10.43
DMPA Administration	98.57	119.11	97.32	114.74	97.32	114.74
Record keeping	2.40	4.00	1.98	2.67	1.98	2.67
Total	**107.14**	**137.58**	**105.47**	**131.87**	**103.94**	**129.86**
C. User with Side Effects (no doses given)						
Counselling about side effects	2.60	3.33	2.60	3.33	0.52	0.67
Medical Exam	8.94	18.48	8.94	16.47	2.29	3.02
Total	**11.54**	**21.82**	**11.54**	**19.80**	**2.81**	**3.69**
D. Clients seeking information						
Telephone enquirers	1.56	3.33	1.56	3.33	0.52	0.67
Letter enquirers	14.52	15.67	14.52	15.67	15.04	16.33
In person counselling	11.81	13.27	11.81	13.27	7.64	7.93
Total	**27.89**	**32.27**	**27.89**	**32.27**	**23.20**	**24.93**

Note: Estimates include both providers's time and supplies used in each activity

The most noteworthy results from Table 1 are the following:

- The highest minimum cost of providing DMPA to a new user is at Agra (Rs. 131 or approximately US$3.67) and the lowest is at Varanasi (Rs. 118 or about US$3.30). The maximum cost in Agra is Rs. 173 (US$4.85), while the maximum estimate in Varanasi is Rs. 149 (US$4.20). However, there is a large variation and all three ranges from minimum to maximum have some overlap across clinics.

- The largest component of the cost for new and continuing users is, of course, the DMPA product itself. DMPA administration, including supplies, accounts for from 75 percent to 82 percent of the total cost of services to new clients, and from 92 percent to 94 percent of the cost of services to continuing clients. A large proportion of the difference between minimums and maximums per clinic are also due to the costs of DMPA administration, largely the wholesale commodity cost of the DMPA itself.

- The second most important cost element for new users is the cost of counselling and the medical examination, particularly for the first time user. This is a critical item as staff time is required for ensuring the satisfactory selection of a method for each client and quality of care. More attention to counselling usually results in greater satisfaction with the method, and subsequent greater continuation in use. There is considerable variability both between clinics and between minimums and maximums on this important item. This is an item where minimum standards could be established.

- The range in costs associated with attending users with side effects is largely a function of the number of clients per hundred who return to the clinic seeking care for side effects. The range of percentage of clients returning for side effects management was from 6 percent in Varanasi to 23 percent in Lucknow. This large range is probably due to differences in client profile, client selection procedures, variability in counselling, and the distance clients have to travel to the clinic.

- The cost of providing information to potential clients through telephone and postal enquiries, or counselling of non-users is an important element of dissemination, but represents less than one percent of annual costs of providing the DMPA service.

- **Annual Cost of DMPA Service per Clinic**

The estimates arrived at in Table 2 are used to calculate the annual costs of providing DMPA services at all the three sites. The numbers of clients served are a mean monthly figure based on clinic data for the six month period between July and December 1996 that is, from the time of price change. The numbers and different types of clients served in each of three clinics is given below.

Table 2: Estimated Number of Clients Served Annually

Actual Clients	Agra	Lucknow	Varanasi
New users	178	126	300
Continuing users	136	96	54
Side effects clients	58	98	30
Information seekers	102	112	138
Total	**474**	**432**	**522**

All three clinics undertook advertising activities to promote DMPA through sign boards called kiosks, hoardings, wall paintings, and advertisements in magazines and newspapers. There are variations across the sites in the rentals of the different medium used. The estimates on which the advertisement costs are based on the rates for the highest and lowest rental sites and are given below. The model assumes that about 10 kiosks, 1 to 2 hoardings, 1 to 2 wall paintings, monthly newspaper advertisements and a single magazine advertisement are used. The cost are presented in Table 3.

Table 3: Annual Cost of Advertising

(In Rupees)

Item	Cost in Agra	Cost in Lucknow	Cost in Varanasi
Rental for 10 Kiosks	44,000-56,000	26,000-38,000	26,000-44,000
Hoardings (1-2)	11,000-18,000	17,500-23,500	15,000-25,000
Wall paintings (1-2)	6,300-9,000	5,700-9,000	5,700-7,800
Magazine ads	19,000	19,000	19,000
Newspaper ads	5,700	7,104	6,204

Table 4 uses as input data the estimated costs of serving a single client from Table 2 and 3, and extrapolates it to arrive at the annual costs of service delivery. Further, fixed costs such as those spent on advertising are also included. As advertising costs are a significant proportion of total costs, the costs net of advertising are also presented.

Table 4

ANNUAL COSTS OF DMPA SERVICE DELIVERY

(In Rupees)

Type of client	Agra		Lucknow		Varanasi	
	Min	**Max**	**Min**	**Max**	**Min**	**Max**
Variable Costs						
New Client	23374	30895	16690	20973	35487	44932
Continuing user	14571	18711	10125	12660	5613	7012
Side effects user	670	1265	1131	1941	84	111
Information seeker	315	488	453	639	521	566
Sub-Total	**38929**	**51359**	**28399**	**36213**	**41706**	**52621**
Fixed Costs						
Kiosks	44000	56000	26000	38000	26000	44000
Hoardings	11000	18000	17500	23500	15000	25000
Wall paintings	6300	9000	5700	9000	5700	7800
Magazine advertisements	19000	19000	19000	19000	19000	19000
News paper advertisements	5700	5700	7104	7104	6204	6204
Sub-Total	**86000**	**107700**	**75304**	**96604**	**71904**	**102004**
Total Costs	**124929**	**159059**	**103703**	**132817**	**113610**	**154625**
Total Costs (W/O magazine and newspaper advertising)	100229	134359	77599	106713	88406	129421
Total costs (W/O any advertising)	38929	51359	28399	36213	41706	52621

The most noteworthy results from Table 4 are the following:

- The variable costs of providing DMPA per clinic are not major (e.g. minimums range from Rs. 28,399 to 41,706) relative to overall clinic costs as DMPA clients are still a small proportion of all PSS clients. The difference in annual costs of DMPA service delivery per clinic is largely a function of the differences in the number and type of clients using DMPA services in each clinic.

- Fixed costs of advertising are about twice as high as the variable costs. This implies that advertising might be a cost-effective investment for the introduction of the product, but other avenues for dissemination of information on DMPA services should be explored for future IE & C, e.g. contacting physicians for referral, working with CBD networks who might be interested in expanding choices. Selective use of advertising based on performance of each media would be wise option. Eliminating magazine and newspaper advertisements in the second year would reduce costs, but not necessarily reduce effectiveness of dissemination efforts if other media such as kiosks and wall paintings are used.

Table 5

ANNUAL COSTS AND NET REVENUE

Clinic	Revenue	Loss/gain when advertising included	Loss/gain without magazine & newspaper advertising	Loss/gain without any advertising
All Clients				
Agra	25540	-99389	-74689	-13389
Lucknow	29160	-74543	-48439	761
Varanasi	13080	-100530	-75326	-28626
Per Client				
Agra	54	-210	-158	-28
Lucknow	67.5	-173	-112	2
Varanasi	25	-193	-144	-55

Note: Minimum estimates of total costs from Table 2 are used.

Table 5 presents a description of annual revenues and loss or gain based upon the annual costs provided in Table 4, and the income generated from user charges for the DMPA service. User charges include both gynaecological fees and the price of the DMPA injection. The fees were common across clinics, while the price of DMPA varied systematically between clinics during the study. It should be noted that the revenue figures are not based upon actual receipts, but estimates based upon prices charged multiplied by the number of clients. Actual receipts may differ depending on actual usage and whether discounts given to clients who are unable to pay at the time of injection.

The most noteworthy results from Table 5 are the following:

- Total revenues range from Rs. 13080 in Varanasi to Rs. 29160 in Lucknow. Despite the difference in prices charged for DMPA, the difference in revenues between Agra and Lucknow is not large, given the common fixed gynaecological fees charged in each site and the larger number of clients paying for services in Agra.

- When advertising costs are included (i.e. loss/gain with advertising) all three sites exhibit a deficit. When newspaper and magazine advertising of PSS services, including DMPA, are excluded there are savings of 20 to 30 percent, but revenue would still not be sufficient to cover costs of DMPA service provision. Because of the high commodity cost of DMPA, when all advertising is excluded, only Lucknow reports a positive balance in receipts over expenditures.

- In terms of per client revenues, Lucknow which charges Rs. 100 for DMPA has the largest revenue, Rs. 68 per client. Varanasi, which offers the product at no cost but charges for gynaecological services, will always provide DMPA at a loss because service charges do not even cover the cost of the commodity.

■ Sensitivity of Results to Changes in Prices

Table 6 uses as input data the estimated annual costs of the three clinics and pro-rates the estimates for a hundred clients. The distribution of new users, continuing users, side effect clients and information seekers among the hundred is based on the proportions given earlier. For comparison purposes, the costs per 100 clients is used as the base. It must be noted however that, were advertising removed the total number of clients visiting the clinic would also decrease. The present analysis is possible as advertising did not appreciably increase the numbers of users and when discontinued the total numbers did not decline substantially either. When fixed costs such as advertising are excluded, the figures can be extrapolated to much larger client populations as there are relatively few economies of scale in the context of these three clinics.

The distribution of clients in the three sites is as given below:

Distribution of Clients per 100 Clients Visiting Clinic

Type of Client	Agra	Lucknow	Varanasi
New users	37	29	58
Continuing Users	29	22	10
Side Effects Clients	12	23	6
Information Seekers	22	26	26
Total	100	100	100

The pro-rated annual costs for a 100 clients in the three sites are as given below:

Clinic Site	Total Costs	Total costs without magazine and newspaper advertising	Total costs without any advertisements
Agra	13348	8080	4283
Lucknow	11788	5763	3472
Varanasi	12392	11484	3935

Table 6

SENSITIVITY ANALYSIS: BALANCE OF REVENUE AND EXPENDITURE**

(In Rupees)

Clinics *DMPA price*	**Revenue**	**Loss/Gain With advertising**	**Loss/Gain Without magazine and newspaper advertisements**	**Loss/Gain Without any advertisements**
Agra				
Rs.100+80	**6120**	**-20527**	**-15258**	**-2183**
Rs. 90+70 *	**5450**	**-21197**	**-15928**	**-2853**
Rs. 60+40	**3440**	**-23207**	**-17938**	**-4863**
Lucknow				
Rs.160+140	**7720**	**-16192**	**-10167**	**1188**
Rs. 140+120*	**6700**	**-17212**	**-11187**	**168**
Rs. 100+80	**4660**	**-19252**	**-13227**	**-1872**
Varanasi				
Rs. 80+60	**5240**	**-16555**	**-19717**	**-16555**
Rs. 60+40	**3880**	**-17915**	**-21077**	**-11725**
Rs. 40+20 *	**2520**	**-19275**	**-22437**	**-2775**
All sites				
Prevailing prices	**14670**	**-57684**	**-49552**	**-5460**

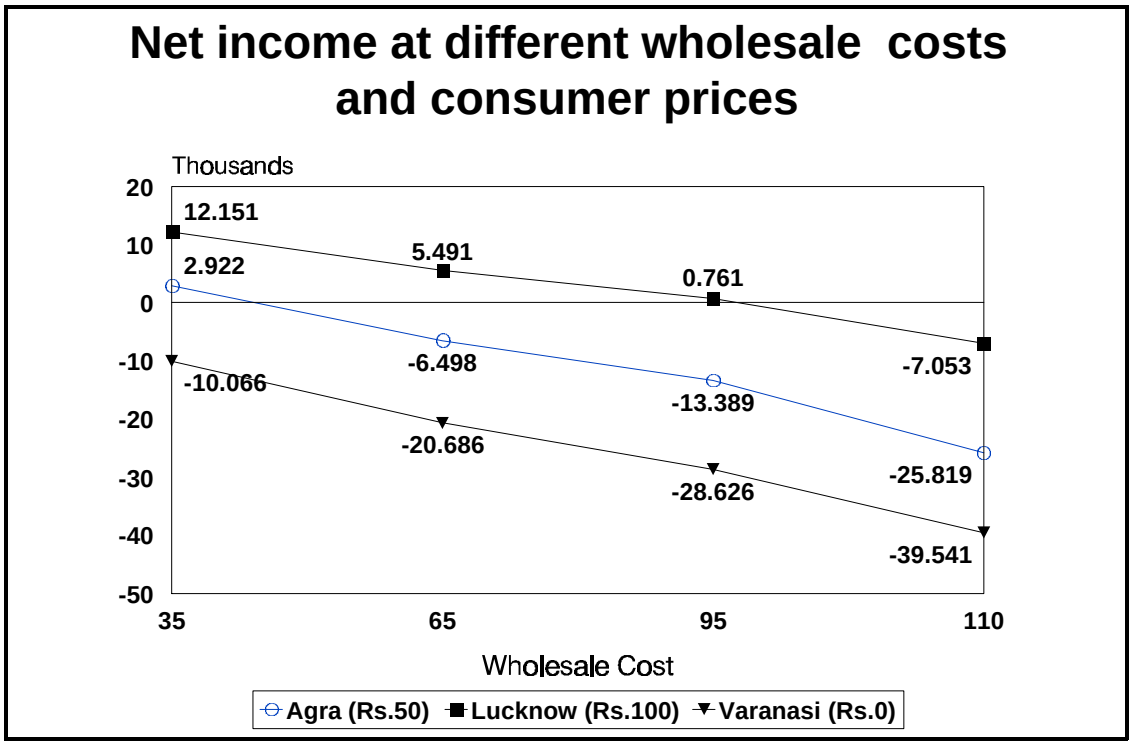
Note: *** Price charged at the present moment for the first and continuing doses respectively.**
****Analysis based on a 100 clients per site**

The most noteworthy results from Table 6 depicting the sensitivity analysis are the following:

- **Per 100 clients, Lucknow would be the only clinic to have a positive income from the DMPA service at the current price (Rs. 40 Gynaecological fee + Rs. 100 for first injection, plus Rs. 20 Gynaecological fee + Rs. 50 for subsequent injections), if no charges for advertising were included. All other clinics provide DMPA services at a loss, given the high commodity price.**
- **Combining all three sites, at prevailing prices PSS actually has a positive balance of Rs. 8180 per 100 clients, when the advertising is wholly subsidized by a donor. Income would increase modestly with further increases in consumer prices, due to the overall dampening effect of price on demand. The only way to make DMPA services more accessible at lower prices without compromising on quality is by reducing the commodity costs of the DMPA.**

- **Sensitivity of Results to Changes in Wholesale Commodity Costs**

The Figure below illustrates the effect on net revenue when variations in the wholesale commodity prices of DMPA are assured. At the current wholesale price of Rs. 95, only Lucknow which charges Rs. 100 has a positive balance per 100 clients (Rs. 761). Were wholesale prices to be reduced to Rs. 65, Lucknow would still have a positive balance but Agra and Varanasi would still require a subsidy. The subsidy in Agra would be only Rs. 6498 (US$182), less than one third of that in Varanasi under current pricing conditions. If the wholesale price were Rs. 35, then both Agra and Lucknow clinics would generate income. Lucknow would generate over Rs. 12000 for every 100 DMPA clients, sufficient to cover the cost of some advertising. This analysis strongly suggests that PSS work with potential suppliers of DMPA to reduce the costs of the commodity before expanding the service further.



DISCUSSION

The data presented in this cost analysis provides Managers at PSS management an outstanding view of the financial consequences of different pricing strategies. For PSS offering the DMPA product and services at commercial rates, i.e. Rs.150, as they did before July 1996, makes little sense as it attracted very few clients. However, lowering the price by decreasing the time spent with clients would severely compromise quality. The importance of looking at quality, as measured by minimum times for counselling and examinations, are therefore also outcomes of importance in this exercise.

There are some cautions that should be observed when using this data for budgeting purposes nationally. Because the data is based on a model of service delivery in Uttar Pradesh, to the extent that the model is different outside of Uttar Pradesh, the data will be less reliable. Similarly, if prices of supplies or salaries change, the estimates will be less stable. The analysis also assumes that DMPA can be provided without contracting additional staff. This is a reasonable assumption in the 3 clinics because staff have been able to handle the increased client load, and in some instances DMPA may have replaced the use of other methods especially orals. The present analysis is therefore based on the total client load in the 3 clinics in Uttar Pradesh. Were the demand for this product significantly larger, requiring new staff, further analysis would be needed to account for these additional costs of scale.

In terms of the analysis at hand, the most important issue for optimising DMPA services is the cost of the commodity. Every effort should be made to seek the wholesale product at the most favourable price for PSS. Given the current pricing strategy, only the Lucknow clinic which charges Rs. 100 has a positive balance between revenue and costs. The minimum estimates suggest that Rs.35 would be an affordable wholesale cost, compatible with the current pricing strategy in both Agra and Lucknow. If supplies can be obtained at below Rs. 35, then obviously net income will increase, other things being equal. Other potential strategies for reducing costs are: sharing costs for advertising with other related services, choosing only selected media for advertising or reducing the time spent on DMPA services with the client. The last option, however, would greatly compromise quality of care and lead to greater discontinuation and client dissatisfaction, and could actually raise the number of clients needing counselling for side-effects.

Advertising is a fixed cost which should be examined closely. Estimates of advertising costs ranged from about Rs. 72,000 in Varanasi to a maximum of Rs.108000 in Agra (US$2,016 to US$3,025). By most standards these are very modest amounts for public information. Preliminary service statistics suggests that there was little impact of advertising on DMPA acceptance during the first few months of using the multiple strategies of newspapers, magazines, hoardings, kiosks and wall paintings. In order to achieve greater awareness in these large cities, perhaps more effective advertising rather than less advertising is required. A more substantive discussion of this issue is forthcoming in the final report on price and demand.

In considering prices, the costs of other items in the local market are important. The Appendix contains a table of market prices of essential commodities in the three clinic cities as of March

1997. In these same markets, a three month supply of pills (Mala N) costs about Rs. 6, less than 10 percent of the cost of the first three months of DMPA use. The cost of condoms for a similar period is about Rs. 72, assuming that 36 condoms are used during a three month period, including wastage. Sanitary pads cost about Rs. 20 for a packet of ten. If amenorrhoea is a side effect, then potentially there might be some individual savings if clients no longer have to purchase sanitary protection. There is little saving if traditional menstrual management practices are used. However, if spotting or prolonged bleeding is a side effect, then client costs for sanitary protection could increase. In Agra, the price of DMPA alone, independent of gynaecological fees, is the same as that for 500 gm of talcum, a personnel hygiene product. In Lucknow, the price of a daily wear saree is about the same price as for two injections including the gynaecological fee. The costs of these commodities would be different in other states and would affect any pricing variation in the local market.

The issue of gynaecological fees is an important one. For the first injection, such fees are important for covering necessary and very real expenditures associated with client counselling, selection and medical examination. Once a smoothly running system is established the medical examination may be substituted by an examination by a nurse or other para medical worker. This would make a significant reduction in cost of physician time. However, qualitative study has shown that client acceptance and continuation is higher precisely because of the attention given by the gynaecologist/ female physician. For continuing users, additional fees without a strong medical rationale may be an added disincentive for users. If injections are in fact provided by paramedical staff, dividing the prices into fees and product may be a possibility but would be confusing for clients and more difficult to administer. The higher initial fee can also be considered as a cost covering mechanism in order to provide free consultations for clients with side-effects. If, on the other hand, fees are commonly waived for clients with lower income, then the dual system makes greater management sense. This is an issue which requires greater discussion, particularly as fees were increased to Rs. 50 for a gynaecological exam in most PSS clinics in April 1997.

The economic costs of disposal of used DMPA vials and other waste are not included in the analysis as the amount of waste is small, and is currently combined with other medical waste from the clinic. If one were to estimate the cost of disposal of DMPA material alone, Rs. 30 to 50 per month per clinic would seem like a reasonable figure. Some clinics in other countries, actually sell glass vials after removing labels and washing, to recover some of the supply costs. More important than the economic costs at this point, however, are the environmental and social costs of waste disposal in urban areas. PSS management is examining alternatives for disposal (e.g. sharing disposal with large hospitals) and ways of reducing waste, (e.g. using glass syringes instead of disposable syringes). Examining the analysis of other public health programs such as the Expanded Program for Immunization (EPI) for ideas on improving disposal of needles and syringes would seem the next important step.

The continuing costs of DMPA should also not be underestimated. A recent study by Janowitz and colleagues (1996) in Bangladesh concludes that in terms of recurring costs, DMPA is one of the more costly methods for a clinic to provide, because multiple visits are necessary and during each visit professional staff time is required. NGOs, such as Marie Stopes clinics in Bangladesh, may distribute the public sector product if DMPA is provided free to the client, but

with a service charge of about Taka 25 (US$0.60). Even without subsidies, costs can be tremendously variable depending on the local market. While in India wholesale DMPA prices may be as high as Rs. 110 (US$3.08) per injection, the product costs in the United States may be $3.51 for an entire year (Hutchings and Saunders, 1985). Charging for services is essential for sustainable high quality service provision at PSS clinics. Similar costing exercises might be useful for other PSS services as well. We should not forget, however, that price and costs are only two elements of a sustainable service. Other components of this research will examine the effect of price on other important variables, such as demand, client profile and satisfaction and will be made available at the end of this year.

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APPENDIX

Estimates of Staff Salaries

Given below are the estimates of salaries for different categories of staff. A range at each salary level is provided to indicate differences in experience, training and skills. It is assumed that each staff works on average for 25 days per month.

Manager cum counsellor	**Rs. 6250-8000 per month**
Receptionist/Record keeper	**Rs. 4333-7083 per month**
Gynaecologist/Physician	**Rs. 9167-12083 per month**
Paramedical staff	
Staff Nurse	**Rs. 5000-7500 per month**
ANM	**Rs. 3750-5833 per month**

Supplies

Given below is the list of supplies used in the various activities, the associated market price of each item and a brief description of the item.

Cost estimates of various supplies

Item	Unit Cost	Description
Intake register	**Rs. 65-85**	**Each register has about 100 pages with 30 lines per page. Each register contains space for an estimated 1000-1500 names**
Patient slip	**Rs.0.10 to 0.30**	**Has details of service required. 10cms by 7 cms**
DMPA client consent card	**Rs. 2.5 -3.0**	**A six sided card. 21cms by 27 cms**
IEC for clients	**Rs.6.60**	**Available in a single colour production with diagrams. Both English and Hindi language pamphlets are available.**
IEC for health practitioners	**Rs.13.00**	**A 3 sided pamphlet**
Non disposable gloves	**Rs. 5-20 per pair**	**1 pair of gloves can be used 3-5 times**
Speculum	**Rs.300-400**	**1 steel speculum can be used on average for a 1000 times**
Alcohol or spirit	**Rs.50-60 for 1500 ml**	**About 1-2 ml used for cleaning injection site**
Cotton wool	**Rs.60-72 for 400 gms**	**About 1 gm of cotton used per injection**
Disposable needle	**Rs.1-2 per needle**	**Usually made of plastic**
Glass syringe	**Rs.20-30**	**Capacity of 2ml. Each lasts for about 50-75 times before breakage**
Client follow up card	**Rs.0.3 to 0.5**	**A small pamphlet (9cms x 14cms) in a single colour with a calendar and menstrual pattern charting**
DMPA clinic registers	**Rs. 65-85**	**Each register has about 100 pages with 30 lines per page. Each register contains space for an estimated 1000-1500 names**
DMPA vial	**Rs. 95 to 110**	**Depends upon wholesale prices**

Market Prices of Essential Commodities

Item	Agra (Rs.)	Lucknow (Rs.)	Varanasi (Rs.)
Sugar (1kg)	14	14	14
Sanitary Pads (for 10)	20	20	20
Toothpaste (1 large tube)	30	25	25
Lifebuoy Soap (1 bar)	7	6	6
LPG (1 cylinder)	135	130	131
Kerosene (1 litre open market)	12	10	10-15
Potatoes (1 kg)	4	4	3.50
Onions (1 Kg)	6	5	6
Groundnut Oil (1 Kg)	45	40	40-45
Milk (1 litre)	12	12	14
Public transport (Min)	2	2.50 (per km auto)	2.50 (per km auto)
Local telephone call	2	2	2
Hindi Newspaper	2.50	3	3
OCPs (1 cycle of Mala D)	2	2	2.25
Nirodh Condoms (packet of 3)	6	5	5
Matches (6 boxes)	3.50	3	3
Batteries (1 pen torch cell)	6.25	5.50	5.50
Talcum Powder (500 gm)	53	50	50
Eyebrow threading	7	12	10
Daily wear saree	150-200	150-200	200-250

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The ANE OR/TA Project is funded by the US Agency for International Development, Office of Population under Contract No. DPE-C-00-90-0002-10, Strategies for Improving Service Delivery.