

A comparative study to analyze the cost of family planning program at the primary health center in Ahmedabad

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Abstract

Background: As family planning programs mature and the requirements for the resources expand, research is required to shed light on cost analysis of the program. A recent World Bank study has focused on the financing and cost effectiveness of the Indian family planning program.

Objective: The objective of this study is to determine the unit cost of a family planning program provided at the primary health centers (PHCs) and to examine the variations in unit cost in different PHCs.

Methods and Material: The present study was carried out in three PHCs of Ahmedabad district, namely Sanathal, Nandej, and Uperdal, between April 1, 2006 and March 31, 2007. For estimating the cost of a health program, information on all the physical and human resources that were basic inputs to the PHC services were collected and grouped into two categories: non-recurrent (capital resources vehicles, buildings, etc.) and recurrent resources (salaries, contraceptives, maintenance, etc.). To generate the required data, two types of schedules were developed: daily time schedule and PHC/SC (subcenter) information schedule.

Results: The unit cost of utilizing family planning method works out to be highest at Nandej PHC (₹ 267.68) and lowest at Uperdal PHC (₹ 190.44), followed by (₹ 194.12) at Sanathal PHC. The high cost at Nandej PHC is due to low utilization of the family planning service.

Conclusions: Increasing the coverage of health services is a key to reduce the unit cost. Personnel costs account for the maximum share of the total cost. Hence, efforts should be made to have a judicious use of personnel.

KEY WORDS: Capital cost, primary health center (PHC), reproductive and child health (RCH), recurrent cost, subcenter (SC), total cost, unit cost

Introduction

As family planning (FP) programs mature and the requirements for the resources expand, research is required to shed light on cost analysis of the program. A recent World Bank

study has focused on the financing and cost effectiveness of the Indian FP program.^[1] Since the 1960s, a number of FP studies have incorporated elements of economic analyses; the cumulated research indicates the actual and potential use of costing techniques in program administration and planning.^[2] Several Population Council projects in Latin America and Asia, and a URC project in Indonesia have conducted costing exercises.^[3] Along with the increase in the number of studies, methodological modifications and refinements have also occurred.^[4,5]

The purpose of this study is to analyze the costs of primary health center (PHC), at the village level, in providing FP services and to examine the variation in unit cost in different PHCs.

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Table 1: List of 13 RCH indicators used to categorize PHCs of Ahmedabad district

S. No.	RCH indicators
1	Total ANC registration
2	Early ANC registration
3	ANC 3 check-up
4	Total delivery registration
5	Institutional delivery
6	PNC 3 check-up
7	TT mother
8	BCG
9	DPT 3/Polio 3
10	Measles
11	Fully immunization
12	Sterilization
13	IUD

Materials and Methods

There were 46 PHCs in the Ahmedabad district. All the PHCs were stratified into two groups, based on the performance of their RCH indicators [Table 1] in the year 2005–2006 (one group with good performance and the other group average). There were 17 good performing PHCs and 29 average performing PHCs. From these two categories, three PHCs were randomly selected one from the good performing PHCs (Sanathal) and two from the average performing PHCs (Nandej and Uperdal). Information on the cost of equipment, building, staff salary, and so on, was collected from the selected PHCs and all the subcenters under the jurisdiction of these selected PHCs. Financial year 2006–2007 (April 1, 2006 to March 31, 2007) was taken as the study period. This is probably consistent with the records of most types of relevant data, such as, expenditure on personnel and services provided. A one-year period avoids any distortions that might be caused by seasonal effects.

This study utilized a variety of methods for collecting data from the district, block health office (BHO), PHC, and sub-center level; depending upon the nature, type, quality, and quantity of data requirements as per the objectives of the study. The list of items for costing with the source of information on each of them is given in Table 2.

Costs of various resources were allocated into various programs according to their uses in the concerned programs. Table 3 shows the allocation statistics used for various inputs.

1. Resources that were being used exclusively to produce only one type of function or service such as curative care or maternal and child health (MCH) or FP or any other program such as malaria.
2. Resources that were being used to produce more than one type of function or service. For example, health functionaries being multipurpose workers, their services were utilized for all programs.
3. Resources that did not produce any function or service, but were used to support general operations; for example, sweeper or room used for storage, waiting space, and so on.

Allocation of cost for the first group of resources was done against the concerned programs. Therefore, if a building or equipment was used especially for an MCH program, the annualized capital cost of the building or equipment was allotted against the MCH program.

Allocation of cost for the second group of resources was done on the basis of the percent of time spent by the workers on that activity. The cost of such resources was allocated to the appropriate program categories in the same proportion as the direct service time of those programs.

For the third group of resources, that is, the resources that were being used only as a support service, the cost allocation for the service programs was done equally.

The allocation of the total cost for different programs was done on the basis of the proportion of time spent by different health functionaries on various programs. For this, a specially developed time use form was provided to the

Table 2: List of items for costing in the PHC and their sources of data as on April 2006

List of items	Source of data
Capital cost	
Building	RCH office, District Health Office, Ahmedabad ^[6]
Vehicle	Wholesale dealer of vehicles
Equipments	CMSO, Gandhinagar
Furniture	RCH office, District Health Office, Ahmedabad
Electrical installations	RCH office, District Health Office, Ahmedabad
Recurrent cost	
Salaries of personnel	Records of salary, BHO
Drugs and consumables	CMSO, Gandhinagar ^[7]
Electricity bills	Records of electricity bills, BHO
Diesel bills	Records of diesel bills, BHO
Telephone bills	Records of telephone bills, BHO
Building maintenance	Receipt of maintenance, RCH office, District Health Office, Ahmedabad

Table 3: Allocation statistics used for various capital and recurrent costs

Inputs	Statistics used for allocation
Recurrent cost	
Salaries of personnel	Total time spent by the employees in each concerned service
Consumables	Based on indents consumed
Electricity charges	Total cost of electrical appliances and electrical gadget fittings in each service unit
Telephone charges	Time used in the concerned service
Building maintenance	Time used in the service
Vehicle charges	Allocated equally to the concerned service
Capital cost	
Building	Time used by the service
Furniture	Total cost of furniture in each service unit
Electrical installation	Total cost of electrical appliances and electrical gadget fittings in each service unit
Appliance and equipment	Total cost of appliances and equipment in each service unit
Vehicle	Allocated equally to the concerned service

Table 4: Cost allocation for family planning program in different PHCs during the year 2006–2007

Items of expenditure	Sanathal	Nandej	Uperdal
RECURRENT COST			
Salary	268,462.30	354,231.00	399,511.00
Consumables	141,212.20	146,000.38	184,713.60
Electrical charges	3863.85	2995.73	2561.60
Telephone Charges	0.00	1557.27	0.00
Building maintenance charges	12,207.76	12,207.76	12,207.76
Vehicle charges	3476.40	4409.20	4844.00
TOTAL RECURRENT COST (₹)	429,222.51	521,401.34	603,837.96
CAPITAL COST			
PHC building depreciation	40,692.38	40,692.38	40,692.38
Subcentre building depreciation ⁽⁶⁾	6091.07	6091.07	7106.25
Furniture depreciation	7754.91	4945.27	9502.31
Electrical fitting depreciation	714.83	499.89	662.23
Appliances depreciation	1539.86	3872.90	6774.16
Vehicle depreciation	11,120.00	11,120.00	11,120.00
TOTAL CAPITAL COST (₹)	67,913.05	67,221.51	75,857.34
TOTAL COST (₹)	497,135.56	588,622.85	679,695.29
Cases handled	2561	2199	3569
Unit cost (₹)	194.12	267.68	190.44

doctors, supervisors, and workers, for reporting their daily activities. These schedules were filled up every day for six consecutive working days. To discourage filling the forms at the end of the day or at a later date, it was instructed to fill up the schedule after finishing some activity. Thus, each worker reported activities carried out for direct services (curative care, FP, MCH, and other programs), support services (supervision, waiting time, traveling time, record keeping administration, etc.).

For estimating the time devoted to different activities, the units attained for different activities were summed. Before summing up, some initial checking of the information on every unit was done. If, for the same 30 minute period both

direct services (resulting in an immediate output) and support services (facilitating production of different services) were reported, only direct services were considered. However, if more than one direct service was performed, one unit was divided equally among as many direct services as were provided during a period of 30 min. Units for support service activities were also summed up in a similar manner.

FP output was measured by the total number of acceptors of various FP methods in the accounting year. The different FP methods adopted are sterilization, intrauterine devices (IUD), oral pills, and condom.

The following definitions were used to calculate the costs

- **Cost:** The value of resources used to produce something, including a specific health service or a set of services.
- **Total cost:** For estimating the cost of the health program, all inputs were classified into two groups: non-recurrent (capital) resources and recurrent resources; those that are used up in the course of a year and usually purchased regularly (i.e., recurrent costs) and those that last longer than one year, such as buildings, vehicles, and equipments (i.e., capital cost). Total cost is the sum of recurrent and capital costs.
- **Unit cost:** Unit cost is a simple average or the cost per unit of outcome (i.e., an indicator of efficiency).

Results

In this study, we compared the unit costs of FP program at the selected PHCs (Sanathal, Nandej, and Uperdal) by dividing total expenditure incurred in a program by total units of service output in the service. Various operational performance indicators of the Sanathal PHC, Nandej PHC, and Uperdal PHC are provided in Table 4; using this information the unit cost of FP program has been worked out.

The total resources used in FP program is maximum than other services (Curative care, MCH, immunization and malaria) among all the selected PHCs. The analysis found that the total annual cost incurred at Sana-

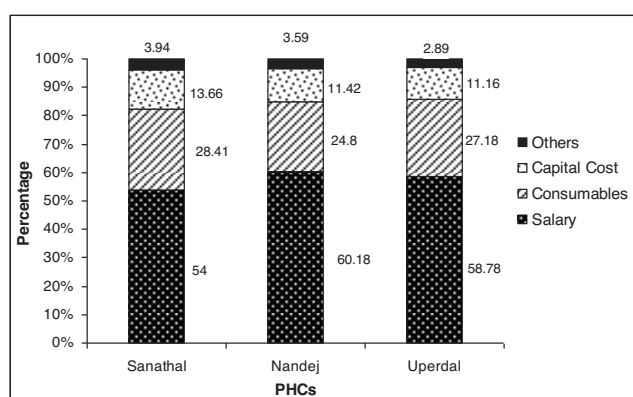


Figure 1: Classification of total cost by components for family planning program in different PHCs during the year 2006–2007.

Table 5: Family planning services performance in different PHCs during the year 2006–2007 (in percentage)

Indicator	Sanathal	Nandej	Uperdal
Sterilization	100	91	100
IUD	100	94	100
Oral pills users	128	107	103
Condom users	99	83	125
Total	101	88	116

Sanathal PHC is ₹ 4.97 lakhs, ₹ 5.88 lakhs at Nandej PHC, and ₹ 6.79 lakh at Uperdal PHC. The unit cost of utilizing FP method works out to be highest at Nandej PHC (₹ 267.68) and lowest at Uperdal PHC (₹ 190.44), followed by (₹ 194.12) at Sanathal PHC.

Figure 1 shows the percentage of the recurrent and capital costs in the total costs of FP program. It is observed that the percentage of capital cost in Sanathal PHC is maximum (13.66%) compared to Nandej PHC (11.42%) and Uperdal PHC (11.16%). Salary constitutes the major cost component of total cost being maximum in Nandej PHC (60.18 %) followed by Uperdal PHC (58.78 %) and Sanathal PHC (54.0 %). In this study, consumables contribute next major cost element after salary. The contraceptive methods individually contribute around 25% of total expenditure being more in Sanathal PHC (28.41%) than Nandej PHC (24.80%).

The performance indicator is calculated by dividing the output measures of a particular indicator from its workload. Table 5 presents the performance indicator of the FP services. Overall 100% of the FP services are achieved by the Sanathal and Uperdal PHCs, whereas the Nandej PHC has achieved the target only in oral pill users. The performance of condom use is 125% in the Uperdal PHC, whereas 83% in the Nandej PHC.

Discussion

This study discusses the approach in developing the estimates of FP services provided by the PHC. This information

can help the government develop and plan for the support required to implement the programs. The study followed the basic principles and steps of costing health care services recommended by WHO^[8] and used in similar studies.^[9]

The unit cost of utilizing FP method works out to be highest at Nandej PHC and lowest at Uperdal PHC followed by Sanathal PHC. The high cost at Nandej PHC is due to low utilization of the FP service particularly condom use. It is observed that percentage of capital cost is lowest for Uperdal PHC, whereas for Sanathal PHC is relatively higher, mainly because of the good appliance and furniture cost. Sanathal PHC is well equipped with computer facility along with other furniture-like soft board for display of articles.

In this study, salary constitutes the major cost component being 54% to 60%. Similar findings were reported in the study conducted by Katariya^[10] (more than 60%), Anand K^[11] (62%), a study of 17 facilities in Morocco by Knowles and Emrich^[12] and Dey and Padhy^[9] (81%) where manpower posted at PHC and subcentre level consumed the maximum share of the operating cost of a PHC.

In the process, a number of assumptions and limitations had to be framed in the study. Actual monitoring of the health staff activities was not possible in the field. Therefore, the time spread sheet filled by them was considered as it was. Time spent on traveling and unproductive activities was not calculated as it was not possible to cross check.

Conclusion

The unit cost of FP program is highest at Nandej PHC (₹ 267.68) and lowest at Uperdal PHC (₹ 190.44), followed by (₹ 194.12) at Sanathal PHC. Component-specific expenditure shows that a majority of the total expenditure was accounted for by expenditure on the staff.

On the basis of this study, the following recommendations are made for better utilization of health care services at the PHC. (1) Increasing the coverage of health services is a key to reduce the unit cost. (2) Personnel costs account for the maximum share of the total cost. Hence, efforts should be made to have a judicious use of personnel. (3) There is a need for more systematic evaluation of the program at district and PHC/CHC level through regular health auditing to make the health services actually reach the needy. (4) For effective management of PHC services, not only mobilization of resources (physical and manpower) but also proper program planning and improvement of quality of service delivery component need to be emphasized.

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References

1. World Bank. *India Public Expenditure Review. Sector Report IV: Social Sectors*, World Bank. Washington, D.C. 1993.
2. Sirageldin I, Salkever D, Osborn RW. (Eds.) *Evaluating population programs: international experience with cost-effectiveness analysis and cost-benefit analysis*. *Popul Dev Rev* 1985;11:152–3.
3. Jensen ER. Cost-effectiveness and financial sustainability in family planning operations research. In: *Operations Research: Helping Family Planning Programs Work Better*, Seidman M, Horn MC (Eds.). New York: Wiley-Liss, 1991;371:297–313.
4. Janowitz B. Why do projections of the cost of family planning differ so widely. *Studies in Family Planning* 1993;24:62–5.
5. Janowitz B, Bratt JH. *Methods for Costing Family Planning Services*. North Carolina: UNFPA and Family Health International, 1994.
6. National Rural Health Mission, Budget 2007–2008, For NRHM Activities.
7. District Health Society, Ahmadabad. Schedule II of fix assets as on March 31, 2007.
8. Creese A, Parker D. *Cost Analysis in Primary Health Care: A Training Manual for Programme Managers*. Geneva, WHO, 1994.
9. Dey AS, Padhy PK. Economic cost of primary healthcare services in India. *Demogr India* 1995;21:195–211.
10. Katariya M, Shrivastava OP. Cost analysis of primary health care: WHO Research Project, NIHFV, 1988.
11. Anand K, Pandav CS, Kapoor SK. Cost analysis of a primary health centre in northern India. *Nat Med J India* 1993;6:160–3.
12. Knowles, JC, Emrich L. *The Estimation of Family Planning and Primary Health Service Costs in Morocco*. Draft. The Futures Group, March 30, 1991.

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