A Comparative Study To Analyze The Cost Of Maternal And Child Health programme At Primary Health Center In Ahmedabad, India

Neeta Mathur*, Atul Trivedi, Geeta Kedia*****

*MBBS, MD (Community Medicine) Apollo Institute of Medical Sciences and Research, Hyderabad, **MBBS, MD (Community Medicine) Government Medical College, Bhavnagar, *** MBBS, MD (Community Medicine) B.J. Medical College, Ahmedabad India.

Abstracts: Background: Cost studies are paramount for demonstrating how resources have been spent and identifying opportunities for more efficient use of resources. The aim of this study was to determine the unit cost of maternal and child health (MCH) programme provided at Primary Health Centers (PHCs) and to examine the variation in unit cost in different PHCs. Methodology: The present study was carried out in three PHCs of Ahmedabad district namely Sanathal, Nandej, and Uperdal, between 1 April, 2006 and 31 March, 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, drugs, vaccines, contraceptives, maintenance, etc.). To generate the required data, two types of schedules were developed, daily time schedule and PHC/SC (Subcenter) information schedule. Results: Unit cost for each contact of MCH beneficiaries was Rs. 54.87 at Sanathal PHC, Rs. 87.63 at Nandej PHC and Rs. 70.01 at Uperdal PHC. Conclusion: Even though maternal and child health services are free, utilization of these services at the health centres were low, particularly for delivery, leading to high unit costs. [Mathur N NJIRM 2015; 6(4):94-98]

Key Words: Antenatal Care (ANC), Capital cost, Maternal and Child Health (MCH), Primary Health Center(PHC), Reproductive and Child Health(RCH), recurrent cost, Subcenter(SC), unit cost.

Author for correspondence: Neeta Mathur, MBBS, MD (Community Medicine) Apollo Institute of Medical Sciences and Research, Hyderabad. Email: neetamathur10@yahoo.co.in

Introduction: Estimating the resources allocated to health care delivery is central to any serious analysis of the health sector. Maternal and child mortality and morbidity remain among the top global health challenges despite various efforts and multitude of resources directed to this field overtime. The high mortality and morbidity rates, especially in developing countries, necessitate prioritization of greater efficiency as part of efforts towards their reduction. The National Health Policy(1982) aimed at reducing the maternal mortality in India from the over 400 per 100,000 live births to less than 200 per 100,000 live births by the end of year 2000. We, even in 2005, are far from this target. [1]

Given the limited health care resources in India, coupled with the wide range of maternal and child health (MCH) services provided free of charge for all women, efficient use of these resources is essential. Despite the need to maximize resources, very few studies focus on detailed analysis of costs and methodological issues in costing of service. [2,3,4]

Specifically, the purpose of this study is to analyze the costs of government hospitals (Primary Health Centre), at village level, in providing maternal and child services and to examine the variation in unit cost in different PHC. This knowledge can better enable health centre managers and policy makers to budget and allocate the appropriate resources that will ensure higher quality of health care services towards reducing maternal and newborn mortality.

Material 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 (1 April, 2006 to 31 March, 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 Subcenter 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.

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

Table 2: List of items for Costing in thePHC and their sources of data as on April 2006

List of items	Source of data
Capital Cost	
1. Building	RCH office, District Health Office, Ahmedabad (9)
2. Vehicle	Whole sale dealer of vehicles
3. Equipments	CMSO, Gandhinagar
4. Furniture	RCH office, District Health Office, Ahmedabad
5. Electrical Installations	RCH office, District Health Office, Ahmedabad
Recurrent Cost	
6. Salaries of personnel	Records of salary, BHO
7. Drugs & consumables	CMSO, Gandhinagar (10)
8. Electricity bills	Records of electricity bills, BHO
9. Diesel bills	Records of diesel bills, BHO
10. Telephone bills	Records of telephone bills, BHO
11. Building Maintenance	Receipt of maintenance , RCH office, District Health Office, Ahmedabad

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.

a. Resources that were being used exclusively to produce only one type of function or service such as curative care or MCH or family planning or any other program such as malaria.
b. 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.
c. 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.

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 services
Consumables	Based on Indents consumed
Electricity charges	Total cost of electrical appliance and electrical gadget fittings in each service unit
Telephone charges	Time used in 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 appliance and electrical gadget fittings in each service unit
Appliance& Equipment	Total cost of appliances & equipment in each service unit
Vehicle	Allocated equally to the concerned service

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

Allocation of cost for the second group of resources was done on the basis of the per cent 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 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 minutes. Units for support service activities were also summed up in a similar manner.

Services under MCH care included are Anti-Natal Care (ANC), Post-Natal Care (PNC), deliveries conducted and new born baby weight taken. The Units of MCH Care was taken as number of beneficiaries contacts in the accounting year.

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). The basic calculation of a unit cost is average cost per total number of beneficiaries who were provided OPD and Indoor services at the PHC/SC.

Results: In the present study, we compared the unit costs of MCH programme at the selected PHCs (Sanathal, Nandej and Uperdal). Unit cost of MCH programme was computed by dividing total expenditure incurred in a programme by total units of 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 services have been worked out. The total annual cost of operating **MCH programme** at Sanathal PHC is Rs. 3.48 lakhs, Rs. 4.58 lakhs at Nandej PHC and Rs. 4.38 lakhs at Uperdal PHC. The cost for each contact of MCH beneficiaries was highest at Nandej PHC (Rs.87.63) followed by Rs. 70.01 at Uperdal PHC and Rs.54.87at Sanathal PHC.

Figure 1 shows the percentage of the recurrent and the capital costs in the total costs of MCH programme. It shows that more than four-fifth of the total expenditure (85% - 81%) was accounted by expenditure on salary. Capital cost is highest in

Sanathal PHC (15.54%) and lowest in Nandej PHC (11.80%).

Figure 1: Classification of total cost by components for MCH programme in different PHCs during the year 2006-07

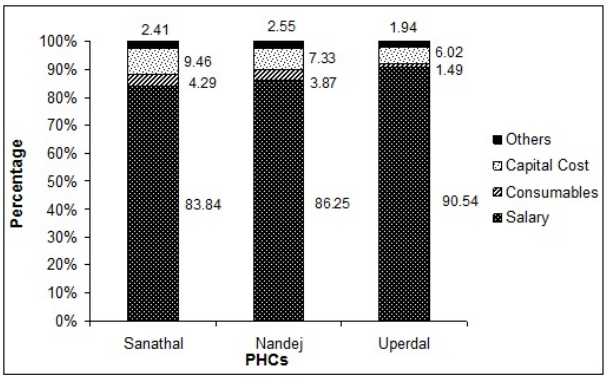

Table 4: Cost allocation for MCH programme in different PHCs during the year 2006-2007

Items of expenditure	Sanathal	Nandej	Uperdal
RECURRENT COST			
Salary	280904.40	391447.80	366977.90
Consumables	2813.00	1451.25	2827.70
Electrical Charges	2612.07	2010.07	1124.18
Telephone Charges	0.00	718.74	0.00
Building Maintenance charges	4293.42	4293.42	4293.42
Vehicle charges	3476.40	4409.20	4844.00
TOTAL RECURRENT COST (Rs.)	2,94,099.29	4,04,330.47	3,80,067.20
CAPITAL COST			
PHC Building Depreciation	14311.34	14311.34	14311.34
Sub-Centre Building Depreciation (6)	23296.87	23296.87	27179.68
Furniture Depreciation	2432.39	2422.27	2388.60
Electrical Fitting Depreciation	483.25	335.42	290.63
Appliances Depreciation	2455.49	2583.11	3425.04
Vehicle Depreciation	11120.00	11120.00	11120.00
TOTAL CAPITAL COST (Rs.)	54,099.34	54,069.00	58715.29
TOTAL COST (Rs.)	3,48,198.62	4,58,399.48	4,38,782.49
Cases handled	6346	5231	6267
Unit cost (Rs.)	54.87	87.63	70.01

Performance indicator

Performance indicator ofMCH programme is calculated by dividing output measures of MCH services from its workload. Table 5 presents performance indicator of MCH services. Overall performance is good in Sanathal PHC (87%) compared to Nandej (71%) and Uperdal PHC (72%). Institutional delivery is lowest in Uperdal PHC (28%). Early ANC registration is only about half of the total ANC registered in all the PHC. PNC 3 check up received is around 80%. Sanathal PHC has achieved target in total ANC registered and total delivery registered.

Discussion: This study discusses the approach in developing the estimates of MCH services provided by the Primary Health Centre. This information can help the government to develop and plan for the support required to implement the programmes. The study followed the basic principles and steps of costing health care services recommended by WHO [7] and used in similar studies.[3]

The study result showed that there is a difference in unit costs across the three PHC. The high unit cost at Nandej and Uperdal PHC is due to low utilization of MCH services particularly institutional delivery.

In this study, personnel cost emerged as the most significant cost in running a health centre. More than four fifth of the total expenditure of MCH services is accounted by expenditure on staff in all the PHCs as health workers male and female are engaged actively in MCH services. Similar findings were reported in the study conducted by Kataria [8] (more than 60%), Anand K [9] (62%), a study of 17 facilities in Morocco by Knowles [10] and AS Dey [3] (81%) where manpower posted at PHC & Sub-centre 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 travelling and unproductive activities was not calculated as it was not possible to cross check.

Table 5: MCH programme performance in different PHC during the year 2006-07 (in %)

Indicator	Sanathal	Nandej	Uperdal
Total ANC Registered	105	98	106
Early ANC registered	58	45	57
ANC 3 Checkup received	91	51	69
Total delivery registered	103	95	97
Institutional delivery	83	57	28
PNC 3 checkup received	80	81	74
Total	87	71	72

Conclusion: The high unit costs reflect underutilization of the existing capacities of the health centres and, therefore, the need to encourage patients to use the health centres. High utilization of ANC and delivery services should improve efficient use of scarce resources and cost recovery for health centres. The study provides useful information that could be used for cost effectiveness analyses of maternal and chid care interventions, as well as for policy makers to make appropriate decisions regarding the allocation and sustainability of health care resources.

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