CHAPTER 4

RESEARCH METHODOLOGY

4.1 Study Design

The research design of this thesis was descriptive and cross-sectional by searching for costs and its outcome related to antenatal care under MCH-FP program between Thana Health complex and Attra Gilatola Health & Family Welfare Center in Fultala thana of Bangladesh.

4.2 Operational Definition

Antenatal care: the term used to describe the medical procedures and care that are carried out during pregnancy to produce a healthy mother and baby at the end of the pregnancy.

Providers cost: cost incurred by the ANC services.

Unit cost: a kind of simple average cost unit of output.

Variable cost: expenses that vary according to the level of service provided or number of people served.

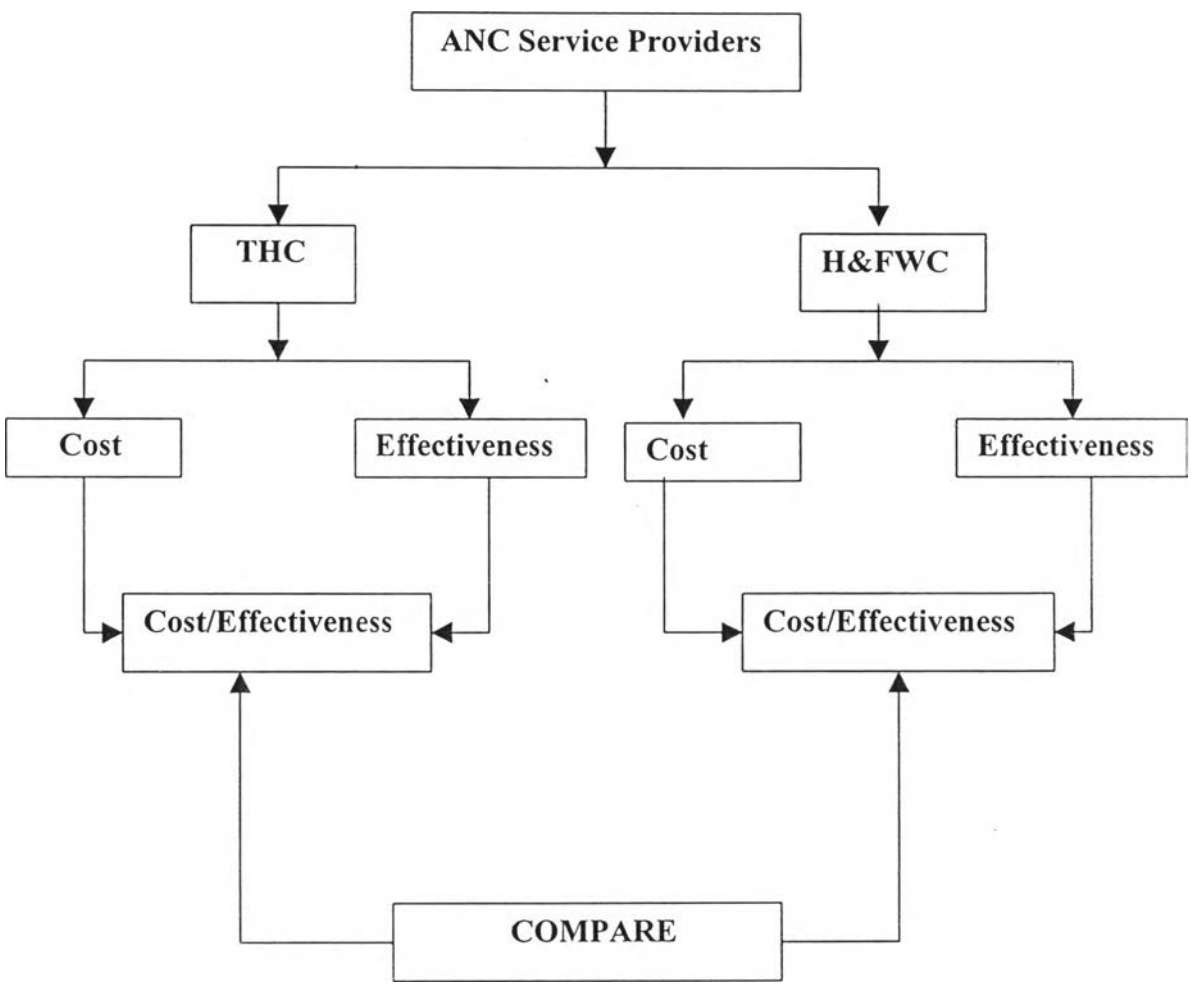
Normal delivery: the type of delivery where the fetus is expelled through the birth canal and presents by head. The process of delivery is completed spontaneously. All obstetric manipulation with the exception of episiotomy is not performed (WHO 1997).

4.3 Framework for Analyses

4.3.1 Conceptual Framework of Cost-effectiveness for Antenatal Care

This study proposed to estimate the cost for antenatal visits and find out the outcome of providing the antenatal services to the pregnant mothers especially in Maternal and Child Health care program. By comparing the cost and cost-effectiveness between Thana Health Complex and Health and Family Welfare Center of MCH – FP program at thana level utilizing services records of 1998. This study only focuses on provider's cost for antenatal care although patient costs should have been included. But the cost were calculated and analyzed only for provider's perspective. Inputs as capital cost and recurrent cost were identified. Capital cost consists of the cost of building, equipment, and vehicles. Recurrent cost includes cost of drug, equipment (recurrent item), maintenance, salary, and traveling. The unit cost of each service center was analyzed and linked that cost to output of the service center and after that compared between THC and H&FWC to improve efficient strategy of providing ANC services. It should be mentioned that effectiveness were measured in terms of percentage of pregnant women covered, number of women who had at least 3 antenatal visits and number (%) of normal delivery that occurred in those pregnant women who received antenatal care visits from the specific health center. Cost-effectiveness of each service center is linked to the output/outcome of the antenatal services in MCH program. A conceptual framwork of cost-effectiveness comparison between THC and H&FWC is shown in Figure 4.1

Figure 4.1: Conceptual Framework of Cost-effectiveness Analysis of Antenatal Services under MCH Program at THC and H&FWC.



4.3.2 Cost for Antenatal Services

Cost is defined as the value of resources used to produce something including a specific health service. Cost is classified either by activities or by inputs.

Costs classified by activities: those costs reflected to the kind of activity or function for which the resources are used (Creese and Parker, 1994). In the service centers some cost items are used for several activities or by several departments of the facilities. The total cost of a activity is the sum of the costs incurred by all the services or goods, which is related to directly or indirectly.

Direct cost: Direct cost is defined in relation to a given activity. In this program direct cost was consist of drugs that consumed by a patient and material used for patients services.

Indirect cost: Indirect costs are those costs in which share to more than one cost objective or cost center. In this study for ANC service indirect cost was salary of personnel, administration, equipment and building cost. Indirect cost is more difficult to identify rather than direct cost.

Cost classified by inputs : Two main items are covered

A. Capital cost
B. Recurrent cost

A). Capital cost: Capital costs are the costs of any resources input or expenditure whose benefit last more than one year (Philips et al 1993). Capital costs include building, equipment, vehicles. For ANC services here two items of capital costs are used in the program - the costs of building and medical equipment.

The average annual capital cost of capital cost item of building was calculated by using the following formula—

$$AC_k = \{ C_t(1+r)^{t_n - to} \} / n$$

Where

AC_k = Average annual cost of the capital cost item at current year (1998).

C_t = The purchase value of the capital cost item at the year bought or made.

r = Interest rate during the period of study i.e. in 1998.

t_n = Current year (1998)

t_o = The year of the capital assets bought or made.

n = Useful life of the capital item.

It is noted that in this formula, n is used as the denominator instead of Af (annualization factor) because some other economic variables e.g. inflation rate, opportunity cost have not been taken into account. This is because there was not much change in these variables over the past two decades. So it is assumed that the value of the building is a straight line as years go by.

After calculating the average annaul cost of capital items, these costs were allocated to antenatal services of each health service center by using a given allocation basis. It should be mentioned that the Health & Family Welfare Center was managed and controlled by the administrator of THC under Family Planning Department. There was no capital cost on capital cost item of building to administration in H&FWC.

- At Thana Health Complex allocation of the calculated annual capital cost of the building were done on the basis of the percent of total space area covered by administration area and patient service area under Family Planning department. So allocation the capital costs of the building at THC was calculated on the basis of the

percent of total space area (square feet) used by the Family Planning department. After that reallocated of that space to the activities on the basis of the percentage of total area covered by administration department and patient service department of MCH-FP program.

- Some cost of equipment was the original cost as drown from the price manual "Antenatal and Postnatal Check-up Register" provided by MCH services, Family Planning directorate, Dhaka. But for some equipment the current cost for similar equipment from the standard cost of equipment account and market price was used to calculate the cost. In this study only one equipment was used for antenatal services and the average annual cost of that capital item was obtained by using the annualiztion factor.

B). <u>Recurrent cost:</u> Recurrent costs are those costs that are used only for not more than one year. This cost consists of the costs of personnel, minor instruments, drugs, repairing and maintenance and miscellaneous.

Cost of each recurrent input was calculated as unit cost of that input at 1998 price and then multiplied by the total number of units used. Recurrent costs are basically calculated as the sum of cost of all inputs used for a particular period i.e. within a year.

Recurrent cost comprises the following items-

A) Salary of administrator
B) Salary of patient service
C) Cost of drugs
D) Cost of equipment
E) Cost of maintenance (utility cost)

- Total salaries of health personnel for antenatal services were calculated by using the following way:

The annual salary costs of personnel were included monthly salary, yearly bonus and travel cost for program supervision, management and patients service in 1998. Both the service centers salary cost of the personnel directly or indirectly related to antenatal patients services under Maternal and Child Health-Family Planning program in 1998 were collected from Thana Health Complex's records and determined also total working hour/ person/year (working days in a year multiplied by working hours/person/year). Total working days were obtained from the attendance register at THC in1998. Then per hour salary cost of each person was calculated by dividing each person's total salary cost/year by total working hour/year.

- As the health professionals and administrators usually are worked at different departments, so their salary were distributed into the antenatal services in terms of how many time they spent their working time as percentage share with this activity for pregnant women managed and serviced. In this case health administrators managed and controlled four service centers. So their activities were calculated in terms of percentage share with these activities for each service center. Their annual salary cost was allocated to antenatal care on the basis of how long is the time they spent for administration.

- Total costs of time spent for each person for antenatal visits were calculated by multiplying the total time spent for antenatal care by his/her per hour salary cost and all personnel costs were also added to get total personnel costs for antenatal services.

Finally the total amount of salary were distributed to provide and manage the antenatal service for each service center separately. To get all personnel's salary for OPD of antenatal service added together.

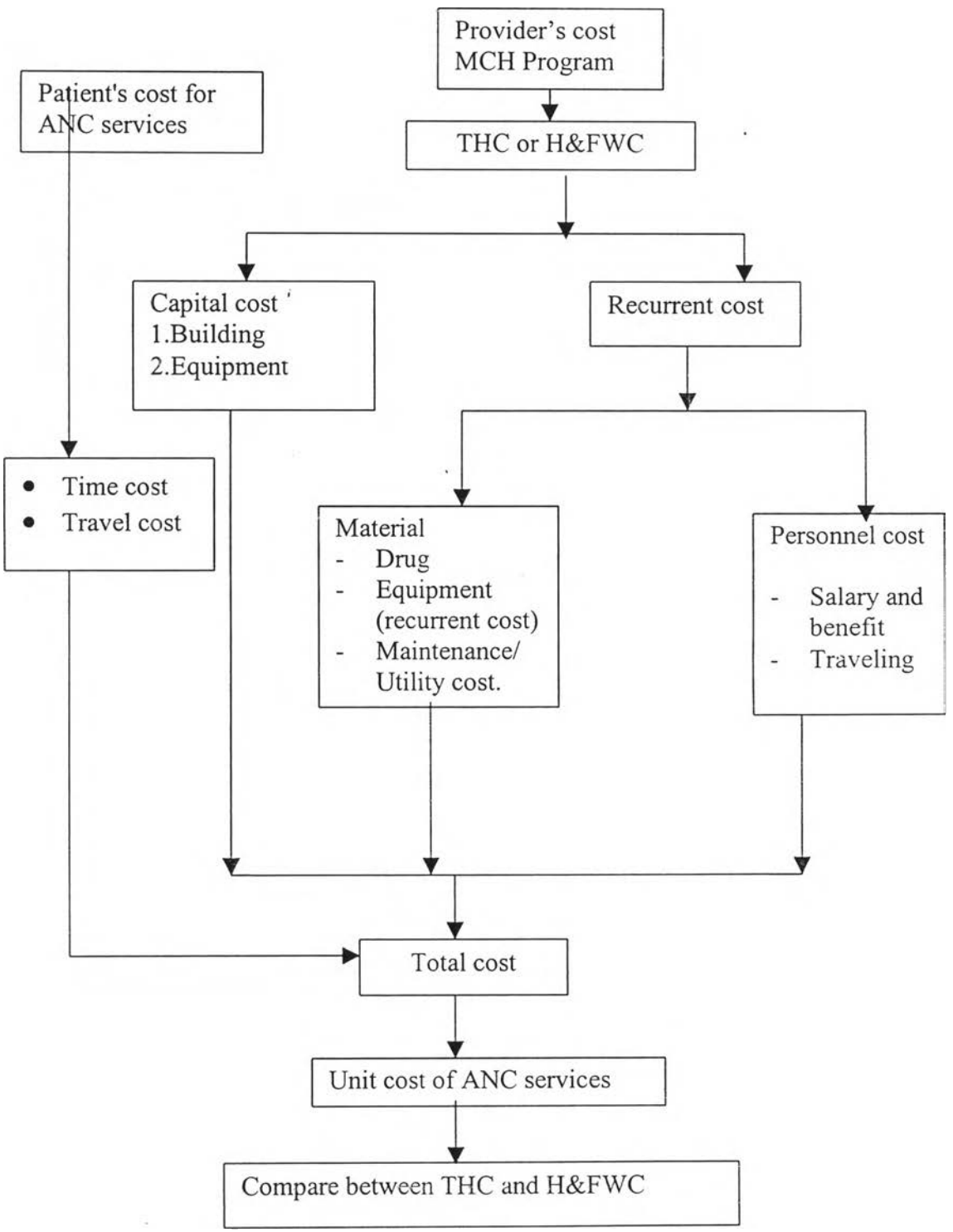
- Total drug costs were calculated by the item of drugs used multiplied by market price of the unit of drugs for the year provided to the pregnant mothers.
- Most of the cost items of equipment were used for antenatal services directly and only B.P machine with stethoscope was used in many activities. So the cost of B.P machine was proportionately allocated to antenatal care for each service center on the basis of total number of patients were served in 1998.

- Recurrent costs of maintenance and stationary were allocated to antenatal care for each service center as percentage share with the activity. It should be mentioned that there were no repairing costs in 1998 for both the health service centers.

In summary, cost can also be classified either from patient or consumer prespectives or from provider or supplier perspectives. This study calculated only on provider perspective, that is, from the point of view of THC and H&FWC. Cost in this study was also classified in terms of inputs, capital cost and recurrent cost. Capital cost consists of two items, building and equipment. Recurrent cost consists of two main items, material cost and personnel cost. There are a few items under material cost e.g drugs, equipment and maintenance or utility cost whereas salary is the main item under personnel cost.

Capital cost and recurrent cost were estimated item by item using the concept described above. When combined all costs together we then got total cost for either THC or H&FWC. Unit cost of antenatal care was then derived by dividing total cost with number of patients in different aspects who received the antenatal services. This study classify costs by the inputs. detailed process to get both total cost and for unit cost of the antenatal services is shown in Figure 4.2

Figure 4.2: Cost of ANC Services



4.3.3 Effectiveness

The proposed measures of effectiveness of the intervention of the maternal and child health program are intermediate and secondary levels as follows:

1). Percentage of pregnant women covered by the antenatal services (intermediate outcome).
2). Percentage of pregnant women who received at least three antenatal visits (intermediate outcome).
3). Percentage of normal delivery of pregnant mothers (secondary outcome).

In this study the cost-effectiveness of antenatal services were measured by the percentage of pregnant women covered, percentage of pregnant women who received at least three ANC visits and percentage of normal delivery among the pregnant women who received ANC services from the health centers (THC or H&FWC) of MCH program in 1998. It is expected that if antenatal coverage increases and pregnant mothers receive at least three ANC visits that can early identify and prevent the risk factors and it may be possible to manage the complication in time. So early contact and more antenatal visits are needed for the pregnant women to reduce the risk factors. It is an ultimate secondary outcome which showed the effect on increase the normal delivery in pregnant mothers. The effectiveness ratio it is expressed in a percentage term.

The formulation was used to measure the effectiveness is given below:

$$\text{Effectiveness} = \frac{\text{Output}}{\text{Target}} \times 100$$

4.4 Data Collection

To find out the cost of antenatal care in the MCH-FP program of THC and H&FWC from provider's perspective data were collected through medical records, observation and interview with the health personnel. Information were collected from 6th February to 20th February in 2000. The information and data needed were as follows:

I. Information on infrastructures such as space in terms of square feet allocated to antenatal services to calculate the cost of building in 1998.

II. In MCH-FP program salary cost of personnel who were involved to provide and manage the patient services of ANC, got monthly salary and yearly bonus, travel costs from government to calculate the recurrent cost for antenatal care.

III. Total drug and equipment (recurrent cost) cost including miscellaneous costs for ANC services.

IV. Electricity and water bill and maintenance cost of the building and services in 1998.

V. Information about cost of construction and purchasing year of capital inputs, useful life time of the capital inputs and interest rate are used to estimate average annual cost of the capital cost items in 1998.

VI. Expenditure for caring cost of drug and materials to manage the patient service in that period, which was included as travel cost.

VII. Total number of pregnant women, total number of ANC visits of THC and H&FWC. Information about total number of normal delivery in terms of number of antenatal visits were collected through medical records in 1998.

VIII. Information on activities of health personnel to calculate cost of time spent i.e. how long time spent for pregnant mother services (e.g. FWV, Doctor and Ayia's time spent). Different types of administrator and staff who were related to manage the ANC services, so know the percentage share with the antenatal care and working hour per day to calculate per hour salary cost of each related staff for ANC services in 1998.

IX. Total target of each intervention and total coverage by the activities of ANC services in MCH-FP program collected from service record of family plannig department provided by GOB.