

# Small price-Big returns

A FACTSHEET ON

## THE ECONOMICS OF HOSPITAL WASTE MANAGEMENT

Anu Goel

**D**uring our work in setting up waste management programmes in hospitals and during seminars and meetings, we realized that budgets and investments are a major concern, when one thinks of setting up such a system. The question generally asked by people is- How much will it cost?

This factsheet aims at answering some of the queries that people have about bins, bags, trolleys and various other equipment, needed for a sound waste management system within the hospital.

The factsheet has been divided into two parts—the first half talks about the various options available in the market and the latter half gives case studies of two hospitals (a 300 and a 30-bedded hospital). Case studies speak about various investments and some strategies that these hospitals adopted to minimise expenditure.

Some bins, trolleys and bags specifically being marketed for the purpose of hospital waste may be too expensive and thus it becomes imperative for the small set-ups to go in for affordable and

Table 2.1

heading

	300 bedded hospital		30 bedded hospital	
Material Required	Initial cost*	Recurring Cost/mth*	Initial cost*	Recurring Cost/mth*
Bins, bags, needle destroyers, chemical disinfectant	76,583	10,000	7000	700

\* Based on actual cost in Rupees

Table 2.2

Garbage collection trolleys/bins and bags

S.No.	Size	Bin dimension (inches)	Cost (Rs.)	Bag dimension (inches)*	Cost (Rs.) (for all the colours)
1.	Small	8 x10 x 21	900	17 x 25	2.50
2.	Small with plastic bin	9 x11 x 16	900	17 x 22	2.50
3.	Large	12 x 14 x 33	1200	25 x 37	5
4.	Extra large	17 x 14 x 33	2200	36 x 40	9
5.	Tilt Bin	14 x12 x 28	2500	29 x 36	3.5

All the bins listed are covered and pedal bins. \*These bags are made up of High Density Polyethylene

Table 2.3  
**Garbage collection bags**

Colour	Dimension (inches)	Cost (/bag, in Rs.)
Yellow	12 x 21	7
Red	23 x 37	8
Black	32 x 40	15

*\*These bags are made up of High molecular weight high Density Polypropylene*

workable alternatives. The process of segregation should not get held up because of lack of funds.

Table 1 gives an overall expenditure incurred by the hospital to have a hospital waste management system in place, excluding final treatment & disposal costs.

Table 2 and 3 list the material available specifically for hospital waste management within hospitals

#### CASE STUDIES

##### **A 300-bedded Hospital**

*Investments made by the hospital for setting up the system*

**Initial** The investments including items 5A, 5D and 5E (with provision of stocks) amounted to Rs. 90,330,

Table 2.4  
**Break up of expenses**

Equipment	Initial Cost (Rs.)	Recurring cost/ mth(Rs)
Bins	17,243	Nil
Needle destroyers	52,500	Nil
Polythene bags	Nil	3000
Chemical disinfectant	Nil	7000
Scissors & forceps	6840	Nil

TABLE 2.5 A  
**Bins**

Bin type	Waste Type	Cost(Rs.)	Req. No.	No.purchased
Galvanised iron bin	Infectious	545	15	0
Hard plastic bins ( 60 lt capacity)	General	796	15	8
Hard plastic bin ( 40 lt capacity)	Disinfected plastic	635	15	15
Twin bin system for chemical disinfection of plastics	Infected plastics	90	15	15

though, due to use of available bins, the actual cost came down to Rs. 76,583.

**Monthly** 10,000 (3000 + 7000, for plastic bags and disinfectant respectively)

#### 5C. Chlorine Solution

- 30 % Liquid concentrate of bleach solution- Rs. 19/ltr
- 1.8% Solution used for disinfection of plastic waste and soiled linen. (Dilutions made in Pharmacy and supplied throughout)
- Daily Consumption of concentrate for waste and linen- 12.5 ltrs (Rs. 240)

#### 5D. Needle Destroyers - Rs. 3500

#### 5E. Scissors and Forceps

(For mutilation and handling of waste)

Scissors- Rs. 135                  Forceps- Rs. 321

#### Protective Gear

Boots/ Pair- Rs.225                  Gloves / Pair- Rs. 64

Provided as part of the uniform and thus not included in waste management expenditure

#### Transportation & Disposal

Trolleys (Hydraulic Lift)                  In process

Table 2.5 B  
**Polythene Bags**

Colour & Size	Waste Type	Cost ( Rs.)
Yellow (20x22)	Infectious	1.02
Black (28x30)	General	2.16
Translucent (20x22)	Disinfected plastics	0.82
Translucent (28x30)	Disinfected plastics	1.50

**Strategy**

1. Already existing bins were used.
2. Hard plastic bins were purchased instead of cheap alternatives or pedal bins, as the hospital, going by their experience, wanted to go in for bins which would last longer.
3. Initially, changing of bags was done on a regular basis. In case of infectious and plastic waste, bags were changed once a day, and for general waste, bags were changed twice daily. The cost of this exercise was coming to almost Rs. 100 daily. The hospital has now decided to experiment with plastic reduction in its waste stream. Thus, only the infectious waste bags are replaced daily, the bags meant for disinfected plastics and general waste are retained till the bag remains intact and clean.
4. The plastic bags purchased by the hospital are cheaper alternatives to the expensive bags available.
5. The hospital purchased extra stock in addition to its present needs, as done for other items, to prevent any slack in the system.
6. To minimize the use of chemical disinfectant in the wards, two bins have been provided, one for disinfection of plastics and one for disinfected plastics. After each shift, or when the bin with disinfectant is full, the contents are transferred to the other bin (min. residence period of any item in disinfectant is 2hrs)

**A 25-bedded hospital**

Initial Investments	Rs. 7000
Monthly Expenditure	Rs. 700

**Chlorine Solution**

Powdered bleach - Rs. 30/ 400gm  
 10% Solution used for disinfection of plastic waste;  
 200 gm powder used in a day.

**Needle Cutters** - Rs. 600

**Protective Gear**- Provided as part of the uniform and thus not included in this expenditure.

**Strategy adopted**

1. To reduce the load of plastics, the hospital is planning to go in for cloth lining. This would cost them 1-2 Rs. / bag.
2. Microbiological studies in the hospital's laboratory have shown that 10% bleach is effective for two days, thus a new solution is prepared every alternate day.

Table 2.6  
**Break up of expenses**

Equipment	Initial Cost (Rs.)	Recurring cost/mth(Rs)
Bins	2200	Nil
Needle cutters	4800	Nil
Polythene bags	-	250
Chemical disinfectant	-	450

Table 2.7  
**Bins**

Bin type	Waste Type	Cost (Rs.)	No. Purchased
Pedal plastic bin	Infectious	90	8
Paper baskets	General	100	existing bins used
Covered twin-bin system for chemical disinfection of plastics	Infected plastics	150	10

Table 2.8  
**Polythene Bags**

S.No	Colour & Size	Waste Type	Cost (Rs.)
1.	Red	Infectious	0.40
2.	Black	General	0.45