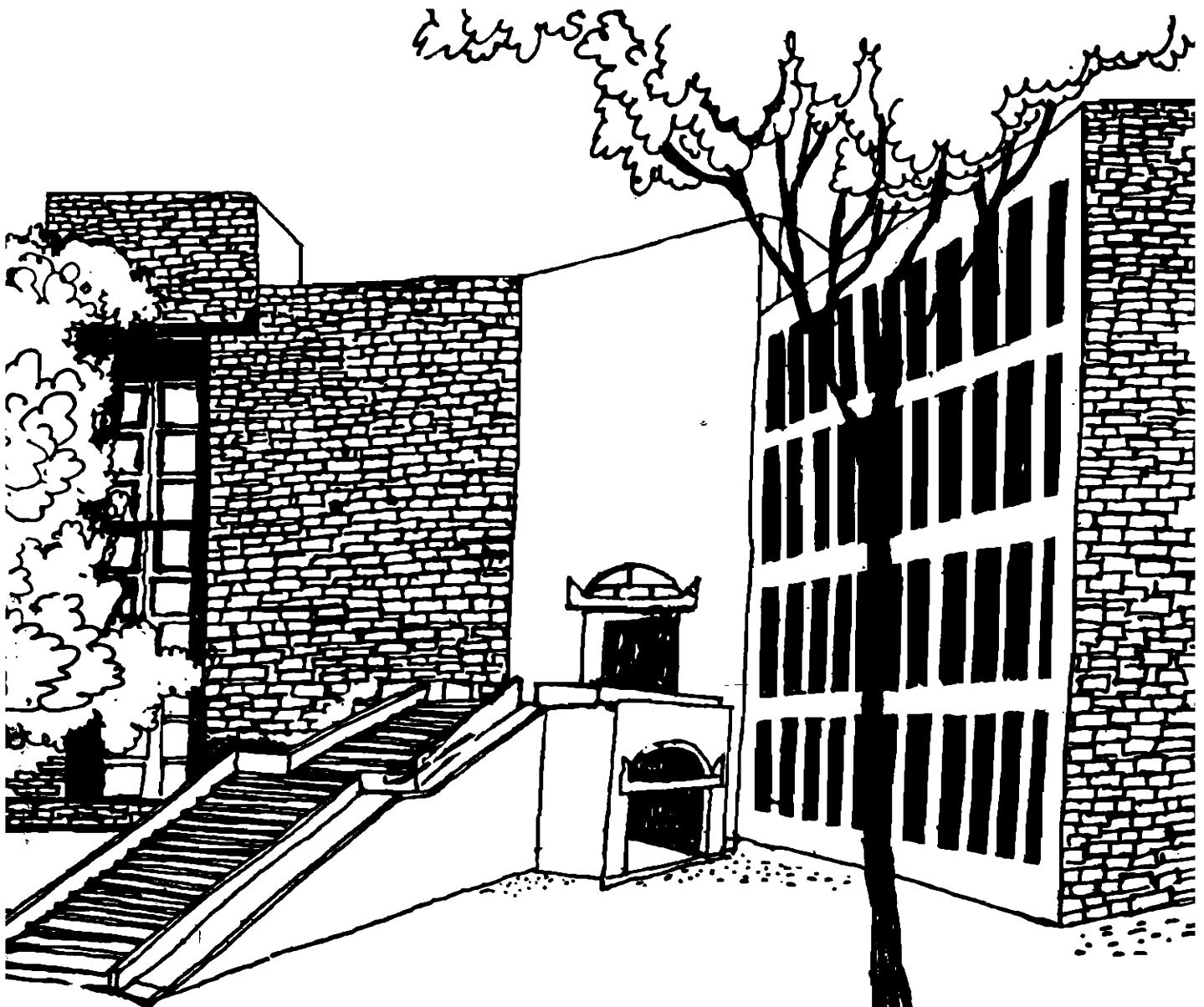




# Working Paper



STRENGTHENING EMERGENCY CARE THROUGH THE  
PROVISION OF AMBULANCE IN PUBLIC HEALTH  
FACILITIES: ECONOMIC ISSUES AND POLICY  
IMPLEMENTATION GUIDELINES

By

Ramesh Bhat

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**Strengthening emergency care through the  
provision of ambulance in public health  
facilities: economic issues and policy  
implementation guidelines**

Ramesh Bhat  
Indian Institute of Management  
Ahmedabad

**July 1999**

## **Strengthening emergency care through the provision of ambulance in public health facilities: economic issues and policy implementation guidelines**

### **Abstract**

Provision of ambulance services in remote areas is an important policy intervention to strengthen the referral system and improve the quality of emergency care. The financial requirements resulting out of capital costs and operating expenses are huge. Given the financial constraints facing the State Governments in India, the departments of health need to explore alternative options. In this paper we discuss the options of leasing or hiring of vehicles. We also examine that if the facility has to self-sustain, what should be user-fees charges from the users of these facilities. However, we discuss policy implementation issues of protecting poor from high burdens and suggest an overall cap on total charges and exempting indigent patients. The role of local governments such as panchayats in creating contingency fund to meet the needs of the poor and developing appropriate exemption policy is considered inevitable to sustain these facilities.

## **Strengthening emergency care through the provision of ambulance in public health facilities: economic issues and policy implementation guidelines**

### **1. Introduction**

Given the distances across the referral facilities and non-availability of timely transportation facilities in rural areas, the ambulance facility plays critical role in reducing the mortality rates of patients needing emergency care. In many parts of the country, particularly in remote areas, the transportation facilities are quite uncertain and generally not available. The private providers and non-governmental organisations are meeting the growing demand for ambulance services. Private ambulance services have grown but charge exorbitant amounts in carrying patients from one facility to another facility. For example, one private ambulance in Diamond Harbour, West Bengal charges Rs. 1200 to carry patient from Gadhmathura to Diamond Harbour for a distance of less than 100 kms. This puts significant financial burden on patients who need emergency care. Access to health care may be hampered because of patient's inability to pay such high amounts for ambulance services. At many places, the patients have no option of private services and they have to rely on public transport system or other means such as bullock-carts and cycle rikshaws.

The arrangement of ambulance for transporting critical patients has become important component in strengthening the referral system and improving the quality in public health care system. The intervention of departments of health in States is, therefore, considered important in providing ambulance services. Given the resource constraints, many governments are not in position to make this facility available in all public health facilities. Policy makers, therefore, need to evolve a policy of developing private public partnerships in these areas. There are three policy issues associated with the provision of ambulance services. These are:

- Whether the department of health should own or hire a vehicle on rental basis to provide ambulance services.
- In case the ambulance services are hired, what should be the reasonable hire charge per month for making ambulance service available?

- In either case, what should be user fees policy for ambulance services, i.e., how much should be charged from patients for the use of ambulance facility?

The policy of the government should be one that puts least burden on patients and ensures that ambulance facilities are available when needed. The following paragraphs discuss these issues.

## **2. Ownership of Ambulance**

So far the policy of most of State Governments has been to own the vehicle and provide the services to patients free of cost. The health facilities face number of difficulties in providing the ambulance services to patients according to laid down policy of the government. Some of these difficulties as experienced are as follows:

### **2.1. Maintenance**

The ambulances at various facilities are not in working condition because of lack of funds to carry out necessary repairs and maintenance of the vehicle. The hospital superintendents also experience long delay in getting sufficient funds for such maintenance. As a result, vehicles are not in use for long period of time and patients do not get ambulance facility when needed.

### **2.2. Fuel availability**

The other difficulty faced by the health facilities in keeping the ambulance facility in running condition is the fixed quota of fuel provided to each facility. Each facility having ambulance facility is allowed a budget allocations for a fixed quantity of fuel to operate ambulance services. When this budget gets over, the facility often stops providing ambulance service to its patients. At many places, the facility has started charging patients by requesting them to take care of fuel cost and is therefore in position to provide ambulance service. However, this facility works just on an ad-hoc basis and there is no formal policy towards this.

### **2.3. Availability of personnel**

The ambulance service is supposed to be available for all 24 hours. It is generally observed that given the work culture and number of holidays an employee can avail, the

number of persons manning the ambulance are always felt inadequate. As a result of this there is always a problem in finding the personnel to run the ambulance services.

#### **2.4. Present use of ambulance facilities**

The use of existing ambulance facilities is not efficient in most facilities. It is noticed that at many places, the health facility staff uses the ambulance either for their official work or ensuring the availability of staff or various inputs to run the health facilities. For example, it was observed that in places where the doctors are allowed private practice ambulance is most often used to get the doctors from their private chambers in case of emergency in hospital. The need for ambulance is also felt because of manning of health facilities is considered a major problem by administration. Many facilities are not manned most of the time and therefore the need for ambulance facilities is high. To overcome this problems in case of emergency, at district level many hospital superintendents have no other way but to send the ambulance to request the doctor to attend the patient at the health facility. This practice also affects the ambulance services because of limited budget for fuel.

### **3. Evaluating other options**

Most of these problems arise because of the ownership of the vehicle is vested with the health departments. It is important to de-link the ownership of vehicles and responsibility of manning and maintaining the vehicle from its use. It is suggested that by doing so one can ensure efficient use of resources. The separation of ownership and use is possible through the system of hiring the vehicle on lease basis. Lease is basically a contract between a Lessor, the owner of the asset, and a Lessee, the user of the asset. Under the lease contract, the owner of the asset gives the right to use the asset to other party, and in return the user agrees to pay lease rentals to the owner. The leasing is one of the important financial services provided by many financial services companies in India. This service has assumed considerable importance among corporate bodies and has grown considerably over the period. The leasing companies offer several types of leasing services. The type of lease that would be appropriate for hiring the ambulance in case of health departments is Operating Lease. Operating lease is a short-term (generally 3 to 5 years) and is cancellable lease agreement. In this type of lease the owner (or leasing company) is generally responsible for maintenance and insurance and may also agree to



provide other services such as manning the vehicle. A single operating lease may not fully amortise the original cost of the vehicle since the vehicle may still have useful life after expiry of the lease period. In addition the leasing company gets the advantage of depreciation tax shield (i.e., depreciation is tax deductible expense and being owner of the vehicle, the company will be able to save tax because of getting this benefit). This also gets reflected in lease rentals.

We provide a comparison of following two alternatives:

- Own a vehicle and provide ambulance services
- Lease a vehicle and provide ambulance services

We also discuss the user fees implications under both these options. In case the health department decides to own or hire a vehicle the financial implications of the two alternatives would be as follows (see Appendix 1 for tabulated comparison):

*Cost of vehicle:* Department of health has to ensure that sufficient amount of funds are made available to purchase a vehicle. Cash-outflow on account of purchase of vehicle can be avoided in case of lease or hire and this is equivalent to saving cash outflows at the outset.

*Salary of drivers and helpers:* The expected salary of two drivers and two helpers is estimated to be about Rs. 1.50 lakhs per annum. Under operating lease contract, the department of health and health facilities will have no responsibility of manning and maintaining the vehicle (we are assuming that lessor or owner of vehicle has the responsibility of manning the ambulance and also takes responsibility of its maintenance). The rental amount payable per month should include reasonable charges for all these expenses. Please see next section for the calculation of these charges and monthly rental amount payable to the agency providing ambulance facility.

*Maintenance expenses:* The maintenance expenses are estimated to be about Rs. 40,000 per annum and expect to increase over the period. Because of the distance problem it is

not possible to have centralised maintenance system and there would be real problem in ensuring proper control of maintenance expenses.

*Insurance expenses:* Insurance expenses have to be borne by the department in case vehicle is purchased and is estimated to be about 1.33% of cost of equipment per annum.

*Fuel (POL) expenses:* As per actual. But because of poor maintenance the fuel charges are likely to go up over the period. As per actual, but based on optimum level of efficiency.

*Opportunity cost of funds:* The funds are scarce in government system and by investing money in vehicles government loses opportunity to make alternative best use of the funds. In case of lease or hiring of vehicle, it will be part of rental payment to the agency providing ambulance service.

*Availability of services when needed:* In case the government owns the facility, this can not be ensured because of the problems discussed above. Operating leases or hiring of vehicles on contract basis are cancellable and services can be ensured through contracting out mechanisms. This would be more effective provided local panchayat and local governing body takes active interest in ensuring services are available when needed.

The following analysis suggests why alternative of hiring of vehicle is more attractive from the financial and operational viewpoint.

### **3.1. Who should provide lease facility?**

The lease facility can be provided by any of the two following entities:

- Organised financial services company in formal sector and having tax paying status
- Self-employed person (SEP) owning vehicle under IRDP scheme and providing ambulance services on rental basis to health facility

It is important to compare the two because of tax implications. For a leasing company under organised sector all its expenses are tax deductible. At the same the company has to pay tax on rentals which they receive from user. The leasing company would also get a

**benefit of depreciation tax shield, because depreciation is tax deductible expenses for leasing company.**

**On the other hand, self-employed person (SEP) who obtains loan under IRDP scheme may have no tax liability. SEP's cost of funds would be less than the leasing company's cost of capital. Also, SEP will have fewer overheads. We present the calculations of rentals under both the options.**

### **3.2. Computation of reasonable hire charges (or lease rentals)**

**It is very important to understand that Lessor providing vehicle on rental basis is operating on profit basis and expects a reasonable return on his borrowed and his own capital. The reasonable returns have been taken into account in calculations. The operating expenses are likely to be higher on difficult routes. Therefore, maintenance and personnel expenses have been worked under three different scenarios based on the difficulty in reaching those areas because of road conditions and other facilities. These may be described as normal, difficult and very difficult situations.**

**The owner of the vehicle will bear insurance and sales tax expenses and these have also been taken into account in calculations. Various assumptions made in computing the lease rentals are presented in Table 1.**

**We have considered the following factors while calculating the reasonable rentals that should be paid to the owner of vehicle:**

- **Present value of all cash inflows accruing to the owner**
- **Present value of all cash outflows (maintenance, personnel, insurance, sales tax)**
- **Inflation factor (5% per annum) has been taken into account in personnel costs while working out present values.**
- **Depreciation tax shield (depreciation per se has been ignored because it does not result into cash outflows at any stage)**
- **Present value of un-amortised value of the vehicle**

| <b>Table 1</b>   |                |                        |                              |
|--|----------------|------------------------|------------------------------|
| <b>Assumptions made in computing reasonable Lease Rentals (or Hire Charges)</b>                                  |                |                        |                              |
| <b>Particulars</b>   |                | <b>Leasing Company</b> | <b>SEP under IRDP Scheme</b> |
| Cost of vehicle  |                | Rs. 3,50,000           | Rs. 3,50,000                 |
| Lease period (for which the asset is taken on lease)   |                | 5 years                | 5 years                      |
| Depreciation rate  |                | 25%                    | Not relevant                 |
| Un-amortised value (or residual value) at the end of the lease period  |                | 40%                    | 40%                          |
| <b>Operating Expenses of Vehicle</b>   |                |                        |                              |
| Maintenance cost per month under three scenarios (as percent of cost of vehicle)                                 | Normal         | 0.25%                  | 0.25%                        |
|  | Difficult      | 0.50%                  | 0.50%                        |
|  | Very difficult | 0.75%                  | 0.75%                        |
| Petrol, oil, lubricants (POL) cost (per km.)   |                | Rs. 1.50               | Rs. 1.50                     |
| Personnel expenses under three different scenarios (driver and helpers salary, per month)                        | Normal         | Rs. 3000               | Rs. 3000                     |
|  | Difficult      | Rs. 3500               | Rs. 3500                     |
|  | Very difficult | Rs. 4000               | Rs. 4000                     |
| Management fee of vendor for providing hire service (one time cost in the beginning of the contract)             |                | 1.00%                  | 0%                           |
| Insurance expenses per annum of vehicle (as percent of cost of vehicle)  |                | 0.13%                  | 0.13%                        |
| Sales tax (leasing company will be required to pay sales tax on lease rentals received from the health facility) |                | 4.00%                  | Not applicable               |
| Inflation factor (per annum)   |                | 5.00%                  | 5.00%                        |
| Number of working days   |                | 25 days                | 25 days                      |
| Minimum expected kms. to operate per day   |                | 260 kms.               | 260 kms.                     |
| <b>Financial Cost of Owner</b>   |                |                        |                              |
| Cost of borrowing  |                | 16%                    | 12%                          |
| Cost of his own funds (expected return on his own funds)   |                | 20%                    | 12%                          |
| Debt/equity ratio  |                | 4 times                | 4 times                      |
| Tax rate   |                | 35%                    | 0%                           |
| Opportunity cost of funds of Owner (after-tax)   |                | 12.23%                 | 12%                          |
| Per month cost of funds  |                | 0.97%                  | 0.95%                        |

Tables 2 and 3 provide computation of monthly rentals for hiring a vehicle on lease basis from two different sources<sup>1</sup>. It is very clear from the above analysis that it is advantageous from the point of health facility to hire the vehicle from SEP under IRDP scheme. Rentals that will be charged by the leasing company are higher to the extent of 12 to 15 per cent.

| <b>Table 2</b>   |                                    |                                    |                                    |
|--|------------------------------------|------------------------------------|------------------------------------|
| <b>Computation of reasonable rentals under three scenarios in case vehicle is hired from leasing company</b> |                                    |                                    |                                    |
| <b>Present values of (after-tax</b>  | <b>Normal</b>                      | <b>Difficult</b>                   | <b>Very difficult</b>              |
| Cost (out-flow)  | -350000                            | -350000                            | -350000                            |
| Management fees (in-flow)  | 2275                               | 2275                               | 2275                               |
| Maintenance expenses (out-flow)  | -51516                             | -77275                             | -103033                            |
| Insurance expenses (out-flow)  | -1082                              | -1082                              | -1082                              |
| Personnel expenses (out-flow)  | -98647                             | -115088                            | -131529                            |
| Sales tax (out-flow)   | -9038                              | -10165                             | -11291                             |
| Depreciation tax shield (in-flow)  | 82061                              | 82061                              | 82061                              |
| Salvage value (in-flow)  | 78315                              | 78315                              | 78315                              |
| <b>Total cash out-flows to owner</b>   | <b>-347634</b>                     | <b>-390959</b>                     | <b>-434285</b>                     |
| <b>Rental Calculation</b>  |                                    |                                    |                                    |
| <b>Rentals per month (POL charges based on actual kms. and standard rate of Rs. 1.50 per km.)</b>            | <b>Rs. 11,809 plus POL charges</b> | <b>Rs. 13,281 plus POL charges</b> | <b>Rs. 14,753 plus POL charges</b> |

| <b>Table 3</b>   |                                    |                                    |                                    |
|--|------------------------------------|------------------------------------|------------------------------------|
| <b>Computation of reasonable rentals under three scenarios in case vehicle is hired from SEP under IRDP scheme</b> |                                    |                                    |                                    |
| <b>Present values of</b>   | <b>Normal</b>                      | <b>Difficult</b>                   | <b>Very difficult</b>              |
| Cost (out-flow)  | -350000                            | -350000                            | -350000                            |
| Maintenance expenses (out-flow)  | -39889                             | -79779                             | -119668                            |
| Insurance expenses (out-flow)  | -1678                              | -1678                              | -1678                              |
| Personnel expenses (out-flow)  | -152809                            | -178277                            | -203745                            |
| Salvage value (in-flow)  | 79440                              | 79440                              | 79440                              |
| <b>Total cash out-flows to owner</b>   | <b>-464937</b>                     | <b>-530294</b>                     | <b>-595652</b>                     |
| <b>Rental Calculation</b>  |                                    |                                    |                                    |
| <b>Rentals per month (POL charges based on actual kms. and standard rate of Rs. 1.50 per km.)</b>                  | <b>Rs. 10,200 plus POL charges</b> | <b>Rs. 11,632 plus POL charges</b> | <b>Rs. 13,066 plus POL charges</b> |

<sup>1</sup> The working of the financial analysis in Excel or Lotus 123 can be obtained from the author on request. The user can change the assumptions and work out the details of user fees and other financial implications based on the actual data.

| <b>Table 4</b>   |                             |                  |                       |
|--|-----------------------------|------------------|-----------------------|
| <b>Fixed Component of Rental Calculations based on Cost of Vehicle under IRDP scheme</b> |                             |                  |                       |
| <b>Cost of vehicle (in rupees)</b>   | <b>Difficulty Scenarios</b> |                  |                       |
|  | <b>Normal</b>               | <b>Difficult</b> | <b>Very Difficult</b> |
| 300000   | 9221                        | 10529            | 11,838                |
| 325000   | 9710                        | 11081            | 12452                 |
| 350000   | 10199                       | 11632            | 13066                 |
| 375000   | 10688                       | 12184            | 13680                 |
| 400000   | 11177                       | 12735            | 14294                 |
| 450000   | 12155                       | 13839            | 15522                 |

The monthly rental has two components: first, fixed component for recovery of all fixed operating costs and second, variable component for POL. The later component is based on number of kms. travelled. The fixed component of monthly rentals will vary with respect to cost of vehicle. Table 4 presents the calculation of fixed component under various assumptions of cost of vehicle.

Hire charges or rentals in the above table have been worked using the principles of time value of money involving annuity and capital recovery factor. In other words, we have found out the monthly annuity whose present value equals (discounted using monthly-required rate of return of owner) the total cash outflow for the lease period of five years.

The lease rental calculations also indicate that the total annual lease rentals are less than the per annum salary of drivers and helpers in case the vehicle is owned and managed by the department of health. It is, therefore, in the benefit of general population to lease the ambulance services. Under lease system through contracting health facility can also ensure that services are available when needed.

### **3.3. User fees charges for ambulance services**

In case the rentals are paid according to calculations shown above, how much should be charged from the patients. Table 5 shows the calculation of user fee that should be charged on per km. basis. It also provides calculation on the maximum amount that

should be charged from a patient. Per km. rate has been worked out on the basis of assumption that vehicle operates for 25 days and runs about 260 kms. per day.

Given the distances at various places, the user charges for ambulance should not discourage poor patients to use the facility. Therefore, we suggest that there should be cap on maximum amount a health facility should charge from a patient. For the referrals up-to sub-divisional hospital or district level hospitals, the patient should not be charged more than Rs. 123 to Rs. 140 given the location of the facility. In case the referral is made to tertiary hospital, the charges should not exceed Rs. 614 to Rs. 702 given the location of the facility.

The user fees for ambulance will also vary with respect to the cost of vehicle. Table 6 provides user charges calculation under various scenarios of cost of vehicle.

The calculation provided above do not take into account the administrative costs of the health facility incurred in managing this arrangement. The facilities should keep proper accounts for ambulance services and collection of user charges. Given the sensitivities and difficulties, the owner will not be in position to take responsibility of collecting the user charges. Proper records should be maintained in case ambulance is used for purposes other than carrying patients like oxygen cylinders and doctors on call etc.

|  | Normal   | Difficult | Very Difficult |
|--|----------|-----------|----------------|
| <b>User fee charges per km.</b>  |          |           |                |
| Operating costs per km. (based on 260 kms per day for 25 days)                         | Rs. 1.57 | Rs. 1.79  | Rs. 2.01       |
| Fuel (POL) cost per km.  | Rs. 1.50 | Rs. 1.50  | Rs. 1.50       |
| User fee per km.   | Rs. 3.07 | Rs. 3.29  | Rs. 3.51       |
| <b>Maximum cap on user fees charges</b>  |          |           |                |
| Maximum limit for referral to SD Hospital/District Hospital (assuming maximum 40 kms.) | Rs. 123  | Rs. 132   | Rs. 140        |
| Maximum limit for referral to tertiary hospital (assuming maximum 200 kms.)            | Rs. 614  | Rs. 658   | Rs. 702        |

| <b>Table 6</b>   |                             |                  |                       |
|--|-----------------------------|------------------|-----------------------|
| <b>User charges (Rs. per km.) calculation based on Cost of Vehicle</b> |                             |                  |                       |
| <b>Cost of vehicle (in rupees)</b>                                     | <b>Difficulty Scenarios</b> |                  |                       |
|  | <b>Normal</b>               | <b>Difficult</b> | <b>Very Difficult</b> |
| 300000   | 2.92                        | 3.12             | 3.32                  |
| 325000   | 2.99                        | 3.21             | 3.42                  |
| 350000   | 3.07                        | 3.29             | 3.51                  |
| 375000   | 3.14                        | 3.37             | 3.61                  |
| 400000   | 3.22                        | 3.46             | 3.71                  |
| 450000   | 3.37                        | 3.63             | 3.89                  |

The comparison of the rates with the private ambulance charges suggests that the rates under the proposed scheme are substantially less. In case of poor patients who can not afford to pay user charges, panchayat or local authorities should create a contingency fund for ambulance. This fund should be used to pay for the ambulance charges of such patients. No exemption should be granted to any patient for using ambulance free of cost under the existing system of exemption policy. It is well documented that, the existing exemption policies do not distinguish between poor and non-poor. Till such time a proper exemption policy is implemented, mechanisms should be developed to ensure that poor do not suffer. In principal, all patients should pay for using ambulance facility. The hospital superintendent and the attending doctor where applicable should jointly have the authority to waive user charges if referral is deemed as a life saving measure and the indigent patient is unable to pay the necessary charges.



| <b>Appendix 1</b>   |  |   |
|---|--|---|
| <b>Comparison of two alternatives of providing ambulance services</b> |  |   |
| <b>Factors to be considered</b>                                       | <b>Owning of vehicle</b>   | <b>Leasing of vehicle</b>   |
| <b>Cost of vehicle</b>  | DoHFW has to ensure sufficient amount of funds are made available to purchase a vehicle  | Cash-outflow on account of purchase of vehicle can be avoided and this is equivalent to cash saving   |
| <b>Salary of drivers and helpers</b>                                  | The expected salary of two drivers and two helpers is estimated to be about Rs. 1.50 lakhs per annum.  | Under operating lease contract, the DHFW and health facilities will have no responsibility of manning and maintaining the vehicle. The rental amount payable per month should include reasonable charges for all these expenses. Please see next section for the calculation of these charges and monthly rental amount payable to the agency providing ambulance facility. |
| <b>Maintenance expenses</b>   | The maintenance expenses are estimated to be about Rs. 40,000 per annum and expects to increase over the period. Because of the distance problem it is not possible to have centralised maintenance system and there is real problem in ensuring proper control of maintenance expenses. |   |
| <b>Insurance expenses</b>   | Insurance expenses have to be borne by the DoHFW and estimated to be about 1.33% of cost of equipment per annum.   |   |
| <b>Fuel (POL) expenses</b>  | As per actual. But because of poor maintenance the fuel charges are likely to go up over the period.   | As per actual, but based on optimum level of efficiency.  |
| <b>Opportunity cost of funds</b>                                      | The funds are scarce in government system and by investing money in vehicles government loses opportunity to make alternative best use of the funds.   | Will be part of rentals payment to the agency providing ambulance service.  |
| <b>Availability of services when needed</b>                           | Can not be ensured because of the problems discussed above.  | Operating leases are cancellable and services can be ensured through contracting mechanisms and provided local panchayat and local governing body takes active interest in ensuring services are available when needed.   |

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