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GUIDELINES

For introducing motorcycles into a
Primary Health Care Programme





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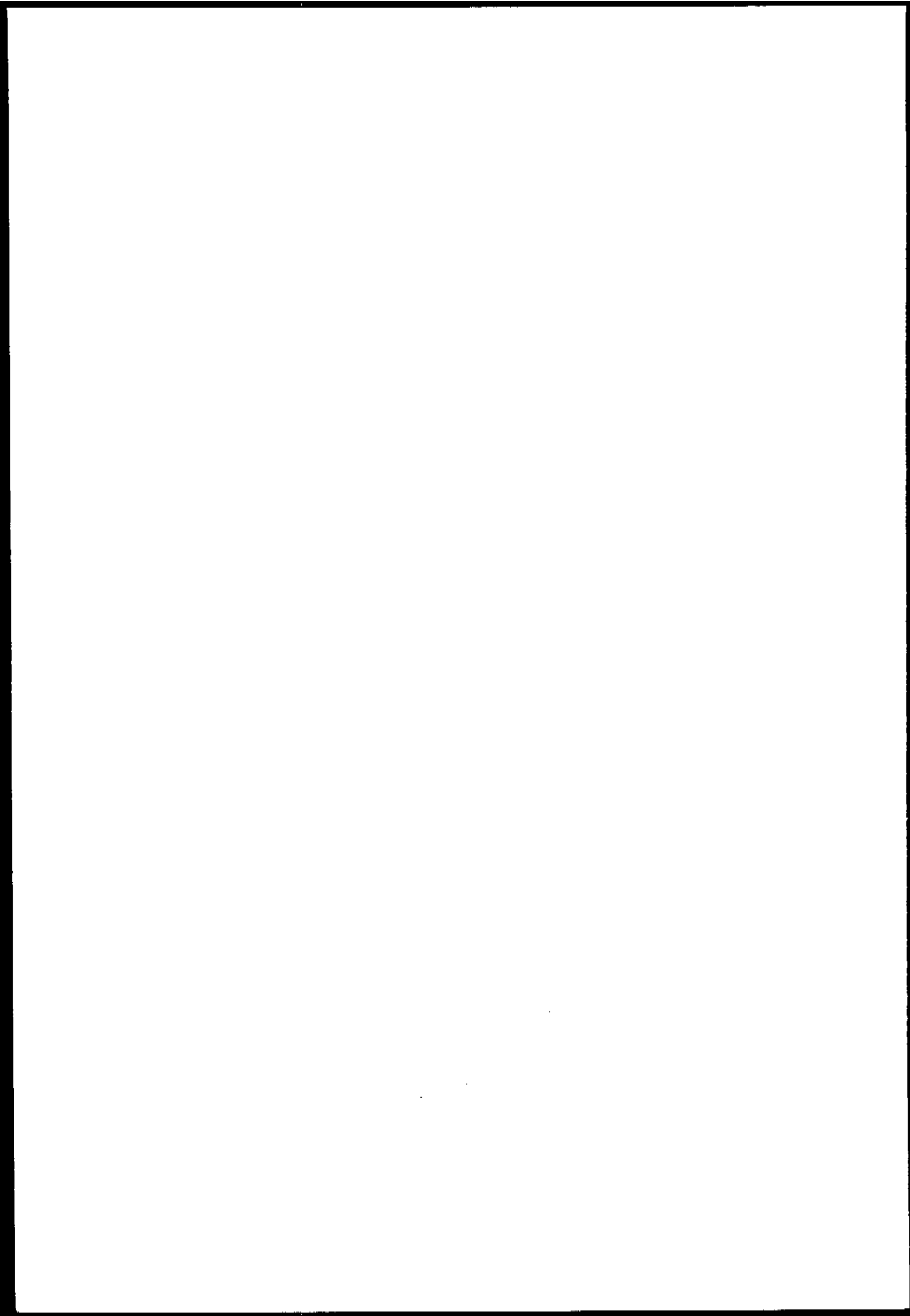
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GUIDELINES FOR INTRODUCING MOTORCYCLES INTO A PRIMARY HEALTH CARE PROGRAMME

INTRODUCTION

Why consider the motorcycle for a health programme?

- The motorcycle will provide an individual form of transport for health workers who might at present have none.
- It will give the health worker greater flexibility as there is no need to share or rely on other people.
- It can be used on trails or paths to reach relatively inaccessible areas.
- In terms of cost, it provides mobility for more individuals at any time than a standard vehicle. For example, one \$10,000 4-wheel drive vehicle may be able to transport 5 people but can only visit one location at a time. Alternatively, \$10,000 spent on 5 motorcycles (at \$ 2,000 each) will provide transport for 5 health workers to visit 5 different places at the same time.

Why read this manual?

- It outlines the specific requirements of a motorcycle project.
- It lists ground rules on which to build an efficient and functional system.
- It provides a framework to help evaluate the usefulness of motorcycles in a programme.

What topics are covered?

The manual includes a section on each of the critical success factors on which the lifetime of the motorcycles and the safety of the riders depend :

1. Advance preparations
2. Type of motorcycle to choose
3. Budget
4. Supervision
5. Ownership agreements
6. Training for instructors and riders
7. Assembly, servicing and repairs
8. Spare parts
9. Evaluation

1. ADVANCE PREPARATIONS

To facilitate the implementation of a motorcycle project a careful review should be made of the type of motorcycle to choose, the budget involved, supervision required, stocks to be ordered, training for riders, and servicing and repair arrangements.

There is normally a delay of 3 to 4 months from the time the motorcycles are ordered and their delivery. During this period advance preparations can be started. The timetable below lists the major tasks involved and gives an indication of the approximate time to allow for each.

Table 1: Timetable for implementing motorcycle project

Activities	Months						
	1	2	3	4	5	6	7
Select supervisor of project	■	■					
Identify riders		■					
Select model type	■	■					
Identify funds	■	■					
Place the order			■	■			
Identify instructors	■	■					
Request consultant/s from WHO/EPI			■	■			
Decide training dates & place			■				
Motorcycle arrival dates				■	■		
Unloading/clearance					■		
Assembly						■	■
Pre-delivery service							■
Registration/insurance							■
Training of instructors							■
Training of riders							■

It should be noted that the motorcycles can be expected to last between 4 to 5 years.

Allowances for reinvestment and replacement must therefore be foreseen in future budgets.

2. TYPE OF MOTORCYCLE TO CHOOSE

- *Who will use the motorcycles?*
- *Will they be males, females or both?*
- *For what will the motorcycles be used?*
- *Will they be used at central level or for outreach services?*
- *Will they have to carry vaccine cold boxes and other supplies?*
- *What kind of terrain will they be used on?*

The answers to these questions will determine the type of motorcycle to be selected. See Table 2 below.

Table 2: Guide to selecting a motorcycle

	Category 1 Mopeds	Category 2 100.150 cc	Category 3 150-250 cc
How many persons will it carry?			
1 person	x	x	x
2 persons		x	x
Female	x	x	
Male	x	x	x
For what purpose is it needed?			
Short distance visits:			
- on good roads	x	x	x
- on rough terrain		x	x
Long distance visits:			
- on good roads			x
- on rough terrain		x	x

3. BUDGET

- *Who will pay?*
- *What will the entire project cost?*

The cost of purchasing and running a motorcycle can be divided into two categories:

First year: Capital costs for purchase and implementation

Every year: Recurrent costs for running and maintenance

Table 3: First year budget for 50 motorcycles

	Local US \$	Foreign exchange US \$	Who pays?
CAPITAL COSTS - FIRST YEAR			
• Motorcycles		50,000	Donor
• Safety equipment (helmets)		10,000	Donor
• Workshop equipment		12,000	Donor
• Training	9,000*	15,000	MOH/Donor
• Registration, insurance, clearance	5,000		MOH
Total capital costs	14,000	87,000	
RECURRENT COSTS - EVERY YEAR			
• Labour (workshop)	9,000*		MOH
• Fuel	15,000*		MOH
• Spare parts		15,000	Donor
Total annual costs	24,000	15,000	

Table 3 summarizes the average first year costs (capital and recurrent) for 50 motorcycles in an African country. Although costs and donor input will vary from country to country, these figures give a general idea of the overall costs of implementing and running a motorcycle project.

If donors agree to fund a motorcycle project, their commitment will normally cover the purchase of the motorcycles and spare parts for the first year only. If the project is to survive beyond the first year, it is essential that requirements for the whole lifetime of the motorcycles are provided for and commitments are made at the time the decision to purchase is taken. These commitments can be grouped together to constitute the Whole Lifetime Contract (see Annex 2 for an example).

* For breakdown of costs see Annex 1.

4. SUPERVISION

- *Who will supervise and run the project?*
- *Who can help with the implementation?*

A senior transport manager in the ministry of health must be identified and made responsible for the overall operation and supervision of the motorcycle fleet. The **health unit supervisor** must be delegated responsibility for the use of the motorcycles within his/her unit. Each rider will take responsibility for the maintenance of his/her motorcycle, in accordance with conditions laid out in the ownership agreement (see below). It will be duty of the health unit supervisor to ensure that the conditions of this agreement are being carried out satisfactorily.

5. OWNERSHIP AGREEMENTS

Concerning maintenance and use of the bike:

- *what are the responsibilities of the ministry of health?*
- *what are the responsibilities of the rider?*
- *what recompense is due to the rider?*

An ownership agreement is a contract drawn up between the rider and the ministry of health to establish the rider's responsibilities. It will vary from programme to programme but basically it should clearly stipulate what the rider can use the motorcycle for, what regular servicing must be carried out and what records must be kept. See example in Annex 3.

Some countries have established a basic ownership agreement with the riders whereby each rider is responsible for all maintenance and fuel costs for his/her motorcycle. After three years the motorcycle becomes the rider's property. This approach has proved to be a successful incentive for the rider's to take good care of their motorcycles. It is important to include a clause which is fair to both parties in the eventuality of the rider moving to a different health centre during the three years covered by the agreement. Insurance during this period will be the responsibility of the ministry of health.

6. TRAINING FOR INSTRUCTORS AND RIDERS

- *When and where can a training course be set up for the riders?*
- *Who to select as instructors?*

Once the motorcycles have arrived in the country a firm date must be established for the first training to take place.

WHO/EPI and Save the Children /United Kingdom (SCF) have developed a training programme with training materials in English and French to support it. They are prepared to send a training team to coordinate the training in any country which has launched a motorcycle project.

The team will generally include a professional motorcycle instructor and a transport consultant and will spend up to two weeks in the country. They will start by training 4-6 instructors over an initial 4-day period. Once the training for local instructors is complete, the WHO/SCF trainers will support and supervise the next phase of the training. This will also take 4 days and the newly trained instructors will train the riders. The number of riders who can be trained will be between 16 to 24, that is, 4 riders per instructor.

The persons selected to be trained as instructors should already have good experience in riding motorcycles. The riders, however, need not have previous motorcycle experience but should at least be able to ride a bicycle.

For the training it is recommended that each rider learns on the motorcycle he or she will eventually be using. The participants are taught the fundamentals of riding and are given ample practical experience in riding techniques and maintenance and repair procedures.

The training materials consist of a module, *Riders for Health*, which is given to each instructor and a set of *Rider Cards* which is given to each rider.

The *Riders for Health* module provides the basic curricula for training the instructors as well as the riders. It is to be used in conjunction with the owners manual for each motorcycle and has clear and precise descriptions of riding techniques, maintenance and simple repairs.

Requirements for the selection and preparation of the training ground, workshop space, equipment and support for the course are also included, together with a basic draft timetable to be adapted to suit the local conditions.

The four *Rider Cards* are packed in a protective plastic envelope and are to be kept by each rider with his/her motorcycle at all times. They constitute a compact summary of the main topics covered during the training:

Card 1 has a simple outline of riding techniques.

Card 2 gives safety instructions on what to wear, precautions to take and what to do in an emergency.

Card 3 is a fault finding card with a chart to identify the cause of problems and simple instructions on repairs.

Card 4 is a maintenance record card. Dates of services, replacement of spare parts and types of repairs have to be filled in regularly by the rider.

After the training, each rider who has successfully completed the course should receive:

- a certificate which confirms successful participation in the Riders for Health Training Course; and
- a set of Rider Cards.

He/she should do the national driving test to obtain the country's driving license and, finally, sign an Ownership Agreement before taking charge of his/her motorcycle.

7. ASSEMBLY, SERVICING AND REPAIRS

- *Who will take responsibility for this: a local agent or the government workshop?*
- *What arrangements to make concerning assembly and pre-service?*
- *What conditions to stipulate in drawing up a service agreement?*

The **local agent** in any country is usually the importer for a range of motorcycles from one manufacturer or more. He will generally keep regular contact with the manufacturer and have a fully equipped workshop with adequate spare parts to service and repair the models that he imports.

The presence of a good local agent can be one of the determining factors in choosing a particular motorcycle. He can help assemble and maintain the motorcycles and can be a useful source of information, particularly in regard to the spare parts. He will know which spare parts are used each year and what quantities should be ordered. He will also be well aware of all the administrative and financial requirements involved in importing equipment.

Before establishing an agreement with a local agent the first thing is to negotiate a favorable price for the purchase of the motorcycles as well as for service and repairs. Each agreement will differ slightly, but it is important to ensure that:

- The agent's workshop is able to cope with the increased workload necessitated by the additional motorcycles. This will include assembly of the motorcycles when they arrive and preparation for the pre-delivery service.
- If the agent is the manufacturer's representative, he will perform the pre-delivery service on each motorcycle.
- There must be sufficient capacity for storage of spare parts as well as space for maintenance, including the regular routine servicing and the repair requirements for the new fleet of motorcycles.
- Mobile servicing units will be sent out by the workshop to repair motorcycles in remote areas.
- Training will be given by the agent's workshop to the mechanics at the government workshop if requested.

An example of a Service Agreement is included in Annex 2.

The **government workshop** in some countries may be able to support the project and provide servicing for the motorcycles. It will be necessary to ensure that:

- It can provide support at central, regional and district levels.
- It is equipped to handle the new fleet of motorcycles and can undertake assembly, storage, servicing and repairs.
- It is be adequately equipped with tools and support materials, such as owners manuals etc.
- Mechanics have experience in service and repairs of motorcycles and have completed a training course given by the local agent.

A sample of a Service Agreement is given in Annex 4.

7.1 Arrival of motorcycles

When the motorcycles arrive they will have to be assembled undergo a pre-delivery service before they can be used. This pre-delivery service is very important as the manufacturer's warranty (normally for 6 months) is only valid if it has been carried out by the manufacturer's representative -- in most cases, the local agent. If a service agreement has been drawn up with the local agent a clause to ensure the performance of the pre-delivery service should be included. If the government workshop will be responsible for service and repairs, a special agreement with the local agent should be drawn up for this purpose.

At the time the shipments of motorcycles and spare parts arrive, the supervisor of the motorcycle project, together with the agent and/or workshop manager who is responsible for assembly and/or storage of stocks should be ready to:

- Receive the shipment. Once the motorcycles arrive, the documentation will have to be cleared through customs. As soon as this has been done and the motorcycles have been unloaded, the containers can be taken to the assembly area. The mechanics can then unpack them and start to assemble the motorcycles.
- Unpack, catalogue and store spare parts and other equipment. Where applicable, distribution of spare parts must be arranged to coincide with despatch of the motorcycles to regional or district levels.
- Prepare the motorcycles and submit them for the pre-delivery inspection.

DON'T RUSH!

It essential during this stage that nothing is rushed. A desperate need to get the motorcycles built and distributed to the riders as quickly as possible will cause the mechanics to assemble them too fast and make careless mistakes.

7.2 Servicing

When a motorcycle is imported into a country the service requirements are well documented by the manufacturer. The rules for servicing in the *Owners Manual* should be consulted in conjunction with the maintenance guidelines given in the *Riders for Health* module and Rider Card No. 3.

If the motorcycle is to be used in difficult terrain or under unusual circumstances, it has to be maintained in good condition and will need thorough servicing on a regular basis. The intervals between services as recommended by the manufacturer may have to be shortened. One way to do this is to base this interval on hours operated rather than on distance covered (miles/km). A motorcycle in the bush can run for several hours at high revolutions but, because of muddy or sandy conditions, will only travel a short distance. The wear on the motorcycle relative to the distance travelled will consequently be high, and there will be a need for earlier servicing.

In addition to more frequent servicing, off-road motorcycles also have special servicing needs because of the rough conditions they work under. For example, nuts and bolts begin to shake loose and have to be tightened regularly. If they are not, parts -- such as the muffler -- may fall off during a journey. If conditions are very dusty, the air filters will have to be changed or cleaned more frequently. Very wet journeys with a lot of water on the roads or riding through streams might result in moisture getting into the carburetor. This could cause poor starting and the motorcycles would have to be stripped and cleaned.

A possible arrangement to ensure that motorcycles are serviced on a regular basis is to arrange for mobile mechanics to visit the health centres. There are several advantages to this:

- The motorcycles can be serviced regularly.
- The user is at his/her place of work so can be occupied with other tasks while the motorcycle is being serviced.
- Motorcycles which require major work can be replaced by the mobile mechanics and taken for repair at the main workshop, to be returned on the following centre visit.
- The health unit manager can monitor the work carried out by the mechanics.
- The health centre can maintain a more recording procedure on the use of the motorcycles

7.3 Records

For each motorcycle it is important to keep a record of servicing, repairs, distance covered and hours worked. The maintenance card (No. 4) is provided specifically for this purpose. It should be filled in regularly by the rider and kept at all times with the motorcycle. It will show the following information:

- date of each service;
- hours of use;
- distance covered (miles or km);
- parts replaced;
- repairs and maintenance performed.

It is advisable to also keep a backup record card on each motorcycle at central level. This can be updated by supervisors when they make their periodic inspections of the motorcycles and when they check the riders' individual maintenance cards.

8. SPARE PARTS

Spare parts must be available whenever they are needed during the lifetime of the motorcycle. To ensure availability, two actions are essential:

- First, at the time of purchase, a one year supply of spare parts (as recommended by the local agent) must be supplied so that spares are immediately available after the motorcycles are distributed; and
- Second, financing for spare parts needed for the rest of the life of the motorcycle must be secured at the time of purchase and appropriate arrangements made for the reimbursement of the manufacturer or the manufacturer's agent.

Regarding the spare parts which are imported at the time of purchase:

- *Where will stocks be stored?*
- *How will they be distributed?*
- *What sort of record system will be established?*

It is more efficient to keep together all the spare parts until they are needed. However, if the motorcycle project is large and involves several local agents or workshops at regional and district levels, this will not be possible. Batches of spare parts will have to be distributed to each of the local agents or workshops. In this case it is best to despatch the spare parts once the motorcycles have actually been sent to the local regions. If boxes of spare parts arrive in advance of the motorcycles they are often lost or stolen and there are problems with storage and recording.

At district level the local workshop or agent must be able to conduct a full service on the motorcycle and should carry a basic stock of:

- spark plugs
- gear box oil
- chains
- air filters
- sprockets (front and rear)
- brake shoes or pads
- light bulbs

If the workshop is in a remote area where the motorcycles are operating under extreme conditions it will need to be equipped to cope with the heavier wear and tear on items such as tyres and tubes. In addition to the above, it should also stock:

- Tyres and tubes
- Clutch and front brake
- Levers - foot brake and gear
- Clutch plates
- Handlebars
- Plug caps and leads
- Wheel rims and spokes
- Fork seals

At regional or central level the workshop or agent should be fully prepared for any repair a motorcycle might have. In addition to all the items listed above, it should also carry the following, especially if the motorcycles are being used under rough conditions:

- Piston replacement, (due to abnormal wear)
- Gear box repair
- Front and rear damper repair and replacement
- Crankshaft replacement and bearing renewal
- All electrical repairs
- Wheel rebuilding

9. EVALUATION

To improve the use and to gauge the effectiveness of motorcycles in a health programme, it is advisable to conduct periodic evaluations.

During an evaluation the relationship between the riders, agents, donors and the ministry of health should be studied. The records kept by the riders should be checked and the following data extracted:

- The amount of use
- Distance travelled
- The effectiveness of the user whilst using motorcycle
- Regular service, breakdowns, accidents
- Time off the road due to any of the above
- Supply of spares, time waiting for spares
- Funding for spares and service
- Effectiveness of ownership agreements

ANNEX 1: COSTING FIGURES

The breakdowns of the costing figures used in Table 1 are taken from a specific country where training was conducted in 1991.

TRAINING COSTS

6 instructors for 8 days:

Accommodation at US\$15 per day (8x15x6)	US\$ 800	
Meals at US\$15 per day (8x15x6)	US\$ 800	
Per diem at US\$15 per day (8x15x6)	US\$ 800	
Total for instructors		US\$ 2,400.00

24 riders for 4 days:

Accommodation at US\$15 per day (4x15x24)	US\$ 1,400	
Meals at US\$15 per day (4x15x24)	US\$ 1,400	
Per diem at US\$15 per day (4x15x24)	US\$ 1,400	
Total for riders		US\$ 4,320.00

Fuel for 25 motorcycles over the training period:

30 litres x US\$3 x 25		US\$ 2,250.00
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Grand total for training **US\$ 8,970.00**

LABOUR COSTS

The following figures are based on the assumption that 21 working days of every year will be devoted by a mechanic to each motorcycle, either in servicing or repairs:

Daily working hours 8 x 21 per motorcycle	168 hours	
Average hourly salary for a mechanic	US\$ 1.00	
Labour costs for 50 motorcycles: 168 x 50		US\$ 8,400

FUEL COSTS

Fuel costs can be calculated on the basic assumption that each motorcycle will cover an average of 10,000 km per year.

Average fuel consumption for a 110 cc motorcycle is 60 km per litre, at a speed of 40 km per hour.

ANNEX 2: WHOLE LIFE CONTRACT

The details of the agreements made between the donor, the receiving government and the manufacturer's agent will vary from country situation to country situation. However, the major commitments to be covered while the motorcycles remain within the service of the health care programme will remain basically the same. These are listed below, under the suggested responsible party:

The donor agrees :

- to purchase the motorcycles, the initial stock of spare parts, the necessary protective clothing and the helmets;
- to finance spare parts supply for the remainder of the working life of the motorcycles;
- to finance a service agreement with the manufacturer's agent.

The government agrees:

- to guarantee a budget for maintenance, fuel and oil;
- to supervise the utilisation of motorcycles and any changes of ownership.

The manufacturer's agent agrees:

- to make available the appropriate spare parts;
- to assemble the motorcycles and conduct the first service;
- to assist in the training of riders.

The rider agrees:

- to take responsibility for daily maintenance and submit the motorcycle for regular servicing;
- to keep an up-to-date record;
- to use the motorcycle as stipulated in the ownership agreement.

ANNEX 3: OWNERSHIP AGREEMENT

I,.....(name).....

of:(address)

in my capacity ofhave today(date)

taken possession of the motorcycle identified as follows:

Registration number:

Model number:.....

Engine number:

Key number:

I fully understand that:

1. This motorcycle is the property of ... *(the ministry of health)* ... and is issued to me for the sole purpose of facilitating my activities for the *(programme)*.
2. I have full responsibility for this motorcycle and shall be the sole driver of it, unless specific written authorisation to the contrary is given to me by *(the ministry of health)*.
3. I am responsible for keeping records on the use and servicing of the motorcycle, together with information on repairs, spare parts, oil and petrol used each month. It is my duty to report any damage or mechanical fault in the motorcycle to the supervisor and to report when the motorcycle is due for service.
4. The motorcycle is not to leave the district *(define the limits)* ... without written permission from the transport officer.
5. If I misuse the motorcycle or fail to fulfil the above responsibilities the motorcycle will be withdrawn.

My signature below confirms that I have read, understood and fully accept these conditions.

Date..... Signature

ANNEX 4: SERVICE AGREEMENT

Between:

.....(*Project*)..... and(*the contractual partner*).....

Address/ Telephone/Fax numbers

Address/ Telephone/Fax numbers

Name of responsible person

Name of responsible person

1. (The contractual partner) undertakes to repair/maintain the (*project's*) motorcycles in his/her workshop as a priority and with minimum possible delay.
2. The (*contractual partner*) will supply all spare parts needed for the repairs.
3. The current rate of labour of charged by (*the contractual partner*) shall apply to all standard repairs. Body work and repairs carried out in the contractual partner's workshop (*engine overhauls etc.*) will be charged at an hourly rate of Any changes to these rates should be discussed (*project*).
4. Labour costs will be calculated on the contractual partner's standard times.
For motorcycle (*model ...*) the following shall apply:
 - minor service (every 5,000 km) ... hours
 - intermediate service (every 10,000 km) ... hours
 - major service (every 20,000 km) ... hours
 - minor repairs (replacing parts, adjustments) ... hours
 - major repairs (engine overhauls) ... hours
5. At the request of (*the project*), the contractual partner shall provide mobile service facilities to (*the project*). The mobile service teams will travel to outlying health centres where they will undertake servicing and complicated repairs.
6. The (*project*) will pay for the mobile services as follows:
 - vehicle milage ... per day
 - actual fuel consumed
 - daily standing charge ... per day
 - travel allowances(per diem for the contractual party's mechanics) ... per day
 - normal labour rate for hours worked by the contractual party's mechanics
7. The contractual partner shall provide on the job training for the (*project's*) mechanics. This training will be free of charge. The (*project*) will arrange food and accommodation for the trainees.
8. The contractual party will select and order the spare parts required.

The signature of the undersigned parties confirms their agreement to the terms and conditions laid out above:

Signature ... (*Project*)

Signature ... (*Contractual partner*)

Date

Date

The EPI Logistics for Health documentation comprises two categories:

- Information Series
- Training Series

The **Information Series** focuses on the dissemination of updated information, guidelines, policies and procedures on the development and improvement of cold chain systems and technologies. Topics include the transport, storage, distribution and proper administration of vaccines, safe handling of injection equipment, field studies and reports.

The **Training Series** provides material for basic *and* specialised training in equipment maintenance and logistics support procedures. It aims to give health workers the skills necessary to maintain the level of support required to ensure sustained immunization coverage and service delivery.

TECHNET, a global network of logistics specialists for health, collaborates with WHO/EPI on the content and publication of the Logistics for Health documents.

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