

The international newsletter on implementing primary health care

# Health Action

Issue 25 January-April 2000

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TRANSAID Worldwide

*Motorcycles are ideal for many outreach programmes, but they need to be effectively managed.*

## Transport for primary health care

Lack of transport and cost of transport are important reasons why people do not use health care services, especially services requiring a referral. Problems with transport also affect the ability of staff to deliver health services. This issue of *Health Action* looks at some of the reasons why district health managers should be concerned with transport management. It also looks at some practical approaches to managing transport.

One reason why health managers need to be concerned with the management of transport for health service delivery is that transport costs are the third largest part of most district health budgets (after staff and drug costs), and often the largest part of the budget under the direct control of the district manager. Secondly, introducing effective transport management can greatly improve health service delivery. In South Africa, for example, the introduction of an effective transport management system increased the availability of transport for the health sector by nearly 40 per cent, and nearly tripled the amount of vehicle time used for service delivery.

### Transport as a health issue

One of the main reasons that district health managers do not prioritise transport is because they see it as the responsibility of transport professionals. But transport resources in the Ministry of Health should be used to support health care and therefore should be managed as a health resource. Many people think that transport management is about maintaining transport resources; this is one part, but an equally important part concerns managing how transport is used. As health workers are the ones who use health transport, this is another reason why health managers should be responsible for managing health transport.

In a number of countries, health ministries contract out services such as vehicle maintenance to private companies, or these services are supplied by a different ministry or department, such as the Department of Transport. Some countries are even experimenting with using private transport companies to supply services, particularly for bringing supplies to health facilities, because it is often more economical than maintaining a vehicle. Where any aspect of transport is supplied from outside the district health structure, district health managers should still take an active interest in its management to ensure that the overall transport services meet their needs.

### Gender issues in transport

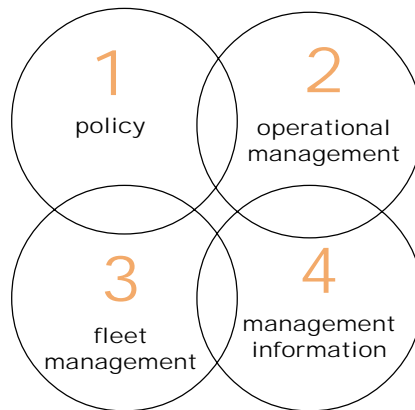
Women and men have different transport needs and different access to transport. In many communities transport resources are owned and controlled by men and many women have limited access to money to pay for transport. Recognising gender issues in transport can mean, for example, strengthening outreach services to reduce the time and money women need to spend on taking household members to

# How to manage transport

*TRANSAID Worldwide has developed a simple system of transport management that works in a wide variety of countries and across the full range of transport activities (from camels to aircraft).*

**T**RANSAID Worldwide is a UK-based transport NGO committed to developing solutions to transport problems that are appropriate to local needs and resources. It first developed its transport management system working with national staff in the Ministry of Health, Ghana. Over the last seven years it has tested and refined this

system in a number of countries with varying needs and transport resources. TRANSAID's transport management system is made up of four parts: policy, operational management, fleet management and management information.



Each part can be looked at separately but the parts interact. So TRANSAID recommends a combined approach to transport management that looks at problems in the system as a whole.

## 1 Developing a health transport **policy**

A health transport policy establishes the rules and guidelines for the management of transport for a given area. In order to improve transport performance, the policy needs to be understood and used by all staff and updated when necessary. So, what are some of the steps to developing a health transport policy?

**Look at existing rules** Most districts have an unwritten policy that is made up of verbal rules, custom and practice (what

*Continued on page 4*

## Information for district health action (IDHA)

*Health Action 23* introduced readers to the IDHA programme, which Healthlink Worldwide is implementing in partnership with the Centre for Educational Development in Health (CEDHA) in Tanzania. In order to benefit from health sector reforms, particularly decentralisation, district health managers need to be able to develop local systems to control and manage resources such as finances, equipment, transport and personnel. The aim of IDHA is to develop a practical model for the production and use of information on subjects like these to enable district health action. This model will include:

1. Regular updates on health sector reforms.
2. Information to support skills-building for district-level management.
3. Information for public health needs, particularly the health needs of poor and vulnerable people.

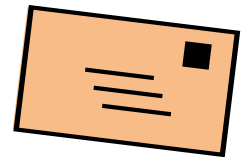
In Tanzania, CEDHA will provide:

- ◆ up-to-date information on health sector reform as it affects districts
- ◆ materials and practical 'How-to' guides in Swahili to support district managers
- ◆ support to the six zonal training centres to produce and distribute information materials.

Healthlink Worldwide will provide:

- ◆ up-to-date information on health sector reform through its newsletter *Health Action*. For instance, issue 24 focused on tuberculosis, this issue looks at managing transport, and future issues will look at malaria and managing finances
- ◆ a series of practical How-to guides designed to help managers examine management practices in their districts and make improvements. A first How-to on transport is planned.

## Feedback...



### Involving the community

A successful primary health care approach needs community involvement to identify local health problems, plan according to these identified problems, and implement the plan with professional guidance.

At the Mirembe Psychiatric School of Nursing, we train post-graduate nurses in mental health and community nursing. This training involves at least two months working with communities in villages in Dodoma region. In our observations, a top-to-bottom approach to health care, in which the community is not really involved, is common. We have found that using a bottom-up approach, where we work with the community to identify and address their main health concerns, encourages community members to take an active role in improving their own health. So, I challenge health systems, especially in developing countries, to use the bottom-up approach to health care.

*Esther Mahinga, Nurse Tutor, PO Box 595, Dodoma, Tanzania.*

### Feedback from readers

Feedback from readers can help in sharing and generating new ideas that can be used in How-to guides and future issues of *Health Action*. Please write to us:

- ◆ with any comments you have on this issue of *Health Action*. For example, ideas you found useful, or practical examples that have worked in your situation
- ◆ if you have examples of good transport management in your district. For instance, if you have managed to sort out a problem by using local skills and resources.

As a prize, a copy of TRANSAID Worldwide's transport management manual will be given for every letter published – so please send in your comments, however short or simple!



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*Carrying out a needs assessment is an important part of transport management.*

people are used to doing), and assumed rules (rules that people believe are policy, even if they are not). These will include things like who can use health transport and how its use is recorded. Look at all these rules, decide which ones you want to keep and what new ones are needed. If your country has a written national or regional policy, make sure your district policy agrees with this. Ask other district development teams, such as the district agricultural team, if they have a written transport policy.

**Get support from senior staff** In order to implement the policy, you will need the support of the most senior members of the district health management team. So involve them in the development of a policy as much as possible. For instance, make the development of a transport policy an agenda item for district health management team meetings.

**Involve other staff** Create opportunities for all other staff to be involved in developing your district health transport policy.

**Make sure it works for all parts of the district** Try out your draft policy with local staff in all parts of the district. You may need to add rules to make sure that it fits local conditions.

**Write and distribute the policy** Write

your district transport policy in clear non-technical language and explain it to all staff. Share the policy with your national health ministry and other agencies you may work closely with.

**Review the policy regularly** An effective transport policy must be reviewed at least once a year and changed if circumstances change or if some parts are not working.

## 2 Operational management

Operational management is about how transport is used. Misuse and inappropriate use of transport are usually the main reasons for poor health transport performance. You will identify the main operational issues when you are developing a written health transport policy.

**Plan and schedule transport use** Look at what transport is available and develop weekly and monthly schedules so that appropriate transport is made available for all priority health service needs. This can mean borrowing and sharing transport or using public transport (where available). In Ghana, one district health team's transport strategy was as follows. Of the 18 outreach locations:

- ◆ 6 can be reached by walking
- ◆ 6 can be reached by public transport
- ◆ 4 can be reached by bicycle
- ◆ 2 can be reached by sharing the education department's vehicle.

**Control the use of transport** The district health transport policy will indicate what records (such as log sheets) need to be made of how transport is used, and who should supervise or approve the transport or journeys. It will also say who can use transport as well as what training riders and drivers should have to promote safe use of transport. The transport policy should outline disciplinary procedures to follow if staff misuse transport.

**Appoint and train transport managers at the local level** The district health team will need to identify a district transport officer. As she or he will need to have authority and respect, they should themselves be a member of the district health management team. To help them manage activities and collect information across the district, you will probably need to appoint transport assistants at the sub-district level. The transport officer and assistant will need to receive training.

While the district transport officer is responsible for day-to-day operational management in the district, the district health management team has overall responsibility for transport management.

## 3 Fleet management

Fleet management is the management of the transport resources. It includes:

- ◆ vehicle specification (deciding the type of vehicle needed)
  - ◆ vehicle selection (choosing the vehicle)
  - ◆ procurement (buying or renting the vehicle)
  - ◆ repair and maintenance (ensuring that the vehicle is in good order and spare parts are available)
  - ◆ replacement planning (so vehicles can be replaced as they become less efficient)
  - ◆ vehicle disposal (by sale, or other method).
- Some fleet management activities require technical skills, but it is not always cost-effective to train people at district level. So fleet management, or some aspect of fleet management, is often contracted out or centralised at regional or provincial level. For instance, sometimes vehicle procurement is centralised, while repair and maintenance are contracted out to a local garage whose mechanics have been trained to follow an agreed maintenance procedure. If fleet management is centralised or contracted out, the district health team still needs to review it as part of an overall transport management system.

## 4 Management information

The availability of simple, appropriate and accurate information is the most important part of transport management. By looking at this information, a transport manager can identify problems and successes, and take appropriate action to improve the system.

TRANSAID has developed a simple management information system that relies on six key indicators of transport performance:

- ◆ kilometres travelled
- ◆ fuel utilisation (kilometres per litre)
- ◆ running cost per kilometre (fuel plus maintenance)
- ◆ availability (were the vehicles available for use?)
- ◆ use (were the available vehicles used for work?)
- ◆ needs satisfaction (did transport support all the work that had to be done?).

Pages 12-13 show how to use these indicators to measure transport performance.

**TRANSAID Worldwide, East Side Offices, King's Cross Station, London, N1 9AP, UK. Tel: +44 (0)20 7922 4939. Fax: +44 (0)20 7922 9090. E-mail: TRANSAID@compuserve.com**

# Using bicycles for outreach

*This case study from Zimbabwe shows that basic principles of transport management need to be applied when using bicycles as well as motorised transport resources.*

Following independence, the Ministry of Health in Zimbabwe bought bicycles for more than 5000 village health workers (now called village community workers) to promote health service delivery in the rural areas. Nearly all of the health workers were women, and most of them were issued with imported or locally-assembled ladies' bicycles, which have a 26inch (66cm) wheel.

The health workers bought their bicycles through a subsidised credit scheme run by the Ministry of Health and UNICEF (United Nations International Children's Fund). Payments were deducted directly from their monthly allowances over a period of two years.

Clinics were issued with at least one 26inch wheel bicycle to help staff to reach all children who needed to be vaccinated. Most of the clinics were managed by female State Certified Nurses, but unfortunately none of them were taught how to ride the bicycles or how to run mobile bicycle clinics in the Ministry of Health's Expanded

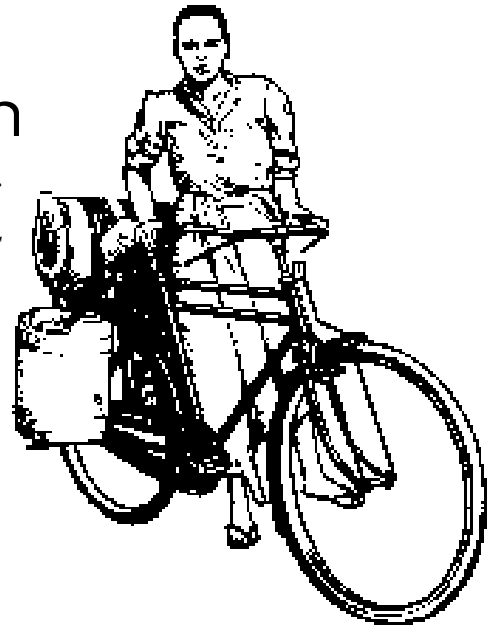
Programme of Immunization (EPI). Clinic staff were also supposed to make home visits to follow up chronic cases such as leprosy, mental illness or other disabilities.

## Lessons learned

A survey in Manicaland (1991) and a pilot study in Mudzi and Mutoko (1992) found that most of the bicycles were out of order, although many only needed puncture repairs or new tyres.

Lessons learned from the project included:

**Management** It is important to manage transport properly in order to use available resources to provide the best possible services. In this example, even though the bicycles were provided to support delivery of immunization services, the immunization extension programme continued to rely on motor vehicles. These vehicles could have been used to provide services that needed motorised transport, such as those that involved travelling large distances or carrying heavy loads.



**Training** As in the example for motorcycles on pages 6-7, riders need training in how to ride bicycles and in simple and regular maintenance procedures. In this project, staff at a quarter of the clinics needed training in how to ride their bicycles. Riders were also keen to learn maintenance skills and this could have been included in their training.

**Gender** Women as well as men can be trained to ride, drive, maintain and manage vehicles. In this example, even where women did not normally ride bicycles, local people thought that it was a good thing that the women health workers used bicycles because it helped them reach more people.

**Maintenance and spare parts** Make sure that you have a good maintenance system. In this example, most riders were not able to carry out simple maintenance procedures such as mending a puncture, either because they did not know how to or because they did not have the necessary spare parts. Riders sent bicycles for repair at the district level where there was a long delay. As well as training riders in simple bicycle maintenance, the project could have made use of local shops by training shop staff to carry out regular maintenance following an agreed procedure and making sure that spare parts for the project bicycles were available at these shops. (In Zimbabwe most people ride men's bicycles, which have 28inch [71cm] wheels and local shops only sold these tyre and tube sizes. Most of the project bicycles were ladies bicycles, which have 26inch wheels.)

*Adapted with kind permission from an article in Rural transport. Energy and environment source book by Jo Doran. Available from Intermediate Technology Publications, 103-105 Southampton Row, London WC1B 4HH, UK. Fax: +44 20 7436 2013.*

## Bicycle ambulances

Bicycle ambulances can help in the transport of sick people. A number of projects are looking at their design, management and use. **The Intermediate Technology Rural Transport Programme (RTP)** in Kenya is carrying out a project to test the management and use of bicycle ambulances in rural Kenya.

The ambulance is a two-wheeled handcart that can be either pushed, or pulled as a trailer by a bicycle. There are many models of ambulance bicycle; the type used in this project is made from metal bars and can be uncomfortable. It can be used to transport people for up to eight kilometres.

In the project, an ambulance is lent to a number of health facilities for one year. The ambulances is hired out to community members and the health facility is responsible for management and maintenance costs and for monitoring the ambulance's use and usefulness. Some limitations have already been identified. For instance, the bicycle ambulance cannot be used in the rainy season when the roads are very muddy, and the tyres often punctured so it is necessary to carry spares.

In another project in Malawi, locally produced bicycle ambulances had problems with stability, durability and patient comfort. TRANSAID Worldwide is now working with design students to build an improved design for field trials. TRANSAID would like to know of any other similar systems that are operating elsewhere - it is particularly interested in seeing drawings, specifications or photographs.

**Rural Transport Team, IT Kenya, PO Box 39493, Nairobi, Kenya.**

**Fax: +254 2 445166. E-mail: it.kenya@itdg.or.ke**

**TRANSAID, see details on page 4.**

# Managing motorcycles for primary health care

An NGO, Riders for Health, is helping to introduce motorcycles into health service delivery – and keep them there.

**M**otorcycles are the obvious vehicles for many outreach programmes and thousands of motorcycles have been donated to district health programmes. However, high rates of breakdown and other problems have led to the failure of many motorcycle projects. Save the Children Fund, UK, and motorcycle experts collaborated to address these problems and Riders for

Health developed from this collaboration. It has offices in Europe and the United States. It has also trained local staff in Ghana, Nigeria, Zimbabwe and the Gambia who now run Riders for Health projects in those countries.

Over the last 10 years, Riders for Health has developed a system to enable health workers on motorcycles to deliver health services in difficult conditions.

This system is sometimes called a zero-breakdown system because if this system is followed the motorcycle will work effectively and without fault for its normal mechanical life.

A zero-breakdown system  
When Riders for Health introduced the concept of zero breakdown in Lesotho, in southern Africa, people did not just smile they laughed. Riders for Health staff smiled too, but for a different reason. And they are still smiling now, because one of Lesotho's environmental assistants – a young man called Mohale Moshoeshoe – has managed a fleet of 47 motorcycles for seven years without a single breakdown. Other Riders' projects show a similar history of success. For instance, in one district in Ghana, a pilot project has run a zero-breakdown fleet for five years.

The zero-breakdown system relies on procuring the correct specification of motorcycle for the job; effective management of the motorcycles; appropriate training for riders, mechanics and managers, and the commitment of all health workers to the use, care and maintenance of the motorcycle.

**Correct specification** Agricultural specification motorcycles with an engine capacity of 100-200cc are ideal for use in primary health care. They are usually simple in design, easy to maintain and resistant to damage in difficult terrain or weather conditions. Trail bikes look good but they are harder to maintain and they do not last as long.

Before you buy a motorcycle, there are a number of questions that you need to ask to identify the correct specification of motorcycle for your needs and operating conditions.

Organisations and ministries contract Riders for Health to set up and maintain zero-breakdown systems for their motorcycles. In situations where you contract out your motorcycle procurement and management, you may still want to use this checklist as part of overall transport management (see checklist).

**Effective management** This is outlined in the article on pages 3-4. For example, in an effective system a transport assistant at sub-district level and the transport officer at district level monitor motorcycle use by recording transport information from riders' itinerary and maintenance forms and log sheets, from mechanics' maintenance and repair forms, and from returns from the spare parts store. The transport officer presents this information to the district health



*Motorcycle riders need practical training, especially in off-the-road riding.*

management team, which uses it as the basis for analysing use of motorcycles, identifying problems and introducing improvements.

**Planned maintenance** Riders, managers and mechanics need training in the use of a planned modular maintenance scheme. Without maintenance, an unmanaged fleet of motorcycles will be useless by the end of the first year – a common story for many projects.

There are five modules in the Riders for Health modular maintenance procedure:

- Module 1 – daily
- Module 2 – monthly
- Module 3 – 6 monthly
- Module 4 – 12 monthly
- Module 5 – 24 monthly.

For example, Module 1, which is called PLANS, is carried out daily by the rider:

- Check **P**etrol, is there enough for the journey, with a little in reserve?
- Check **L**ubrication, check the level of the 2-stroke oil and engine/gearbox oil. Lubricate chain and all pivot points.
- Check **A**ddjustments, adjust the clutch, front and rear brakes, and chain tension. Also check tyres and inflate if necessary.
- Check **N**uts and bolts, ensure that all nuts, bolts and screws are tight.
- Check **S**top, test the brakes for correct operation.



*Motorcycles are an appropriate and economic form of transport for many health workers.*

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**Training in riding** Each rider should learn on the motorcycle she or he will eventually use. They need practical supervised training, especially in off the road riding. Most outreach health service staff are women, and women as well as men should be trained as riders (see box).

At the end of Riders for Health training sessions, riders receive four rider cards, which summarise the activities 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. It has a chart to identify the cause of problems and gives simple instructions on repairs.

Card 4 is a maintenance record card. The rider needs to fill in regularly: dates of services, replacement of spare parts and types of repairs.

The rider cards should be packed in a protective plastic envelope and carried at all times by each rider on his or her motorcycle.

Before taking charge of their motorcycle, riders need to pass their national motorcycle test. They also need to sign a contract agreement, which states the use and care of the motorcycle. If they are going to buy the motorcycle over a period of time they will need to sign an ownership agreement.

Improving health care delivery  
Training riders and support staff and buying the replacement parts needed to

run a zero-breakdown fleet for five years costs twice as much as just buying a fleet. However, this money is soon earned through improvements in health care delivery. Evidence shows that the zero-breakdown approach improves the efficiency of health workers by 400-500 per cent and halves the cost of delivering health care. This must be good news for district health managers.

**Mohammed Dumba, Ministry of Health, Ghana c/o Sheffield Hallam University, UK. E-mail:**

**Mohammed Dumba@student.shu.ac.uk**

**Barry Coleman, Operations Director, 68A High Street, Daventry, Northamptonshire NN11 4HU, UK.**

**E-mail: bcoleman@riders.com**

### Checklist

- ◆ What will the motorcycle be used for?
- ◆ Who will be the main rider (for example will they be male or female)?
- ◆ Will the motorcycle carry one or two people?
- ◆ How far, on average, will the motorcycle be expected to travel each day?
- ◆ How many motorcycles will be needed to perform the task?
- ◆ Will luggage be carried, how much and what weight?
- ◆ Who will maintain the motorcycle, who will manage the maintenance procedure, and who is responsible for paying?
- ◆ Are spare parts to be provided, are they available locally, is there funding to buy them and is there budget provision for long-term needs?
- ◆ Is there budget provision for the purchase of fuel?
- ◆ Is the motorcycle the most appropriate and economic form of transport for this situation?

### Women as riders

In Ghana, more than 80 per cent of riders in the Ministry of Health fleet are women. When Riders for Health started its project in Ghana, it found that women rode motorcycles in the north but not in the south. So it trained women riders in the north as trainers to train male and female riders in the south. The fact that the motorcycle trainers were women overcame any obstacles to women riders. Dress was not a problem either. Women started wearing track-suit bottoms underneath their skirt but now most just wear trousers.

# How to analyse transport needs

*TRANSAID outlines a practical approach to working out what transport resources you need to deliver health services in your district.*

Carrying out a needs analysis involves finding out what transport resources your district has now and what resources your district needs in order to deliver services. Then you need to develop a plan to take your district from the current situation to the ideal situation.

## Current situation

Collect basic information on your transport resources (bicycles, motorcycles, cars, mini-buses). The information needed will be different according to the form of transport, but it should include, for example, make and model, main use, the physical location where it is based and to which programme or individual it is currently allocated. You need to develop a vehicle inventory form that includes this basic information.

Chart 1, page 9, shows an inventory form used in South Africa for motor vehicles. Your inventory needs to be updated at least every six months.

**Transport needs** You will need to find out:

- ◆ work areas that need transport support
- ◆ each unit, for example Expanded Programme on Immunization (EPI), that needs to travel independently
- ◆ the transport requirements for each unit or job, for example, distance travelled, number of passengers and weight of load
- ◆ the vehicle operating conditions for each unit or job. For example, percentage of travel on tar roads or tracks
- ◆ how many days per month each unit needs transport
- ◆ the service delivery priorities, for example HIV/AIDS services – these will change over time.

**Table 1** Transport needs identified

Activity	No. of people required	Days per month	Bicycle	Motor cycle	Sedan/saloon	Large, high clearance	Small, high clearance	Mini-bus	Bus
EPI team 1	2	16	2 x 10	2 x 10	4	0	12	0	0
EPI team 2	5	15	–	–	0	15	0	–	–
HVI/STI team 1	2	10	1 x 8	–	3	0	7	5	0
Training	12	5	–	–	3	0	0	0	0
Monitoring and supervision	1-4	4	1 x 15	–	10	0	1	0	0
Dental health	1	12	–	6	0	0	2	0	0
School health	1	20	–	–	0	0	20	0	0
<b>TOTALS</b>		<b>82</b>	<b>43</b>	<b>52</b>	<b>20</b>	<b>15</b>	<b>42</b>	<b>5</b>	<b>0</b>

**Table 2** Number of vehicles required

Activity	Bicycle	Motorcycle	Sedan	Large, high clearance	Small, high clearance	Mini-bus	Bus
Totals from matrix	43	52	20	15	42	5	0
Increased by margin (25%)	53.75	65	25	18.75	52.5	6.25	0
Divided by 20 (working days in a month)	2.69	3.25	1.25	0.94	2.63	0.31	0
Rounded into whole number of vehicles	3	4	2	1	3	1	0

At this stage look at the transport requirements in terms of the vehicle days (not number of vehicles). Then look at the appropriate vehicle for the job (how to select the right vehicle, page 10, shows you in more detail how to do this). Then indicate the number of days for each activity against the most appropriate type of vehicle for the job. Table 1 gives an example of how to do this.

Once you have identified the number of days that each person, activity or team requires transport, you will need to allow a margin. It is normal to use a margin of between 20 and 35 per cent. This margin is important because it takes into account activities (such as training workshops scheduled for more than one day) when travel cannot be moved onto different days in order to make the best use of available transport, and occasions (such as when teams need to travel to different geographical areas) when trips cannot be combined.

To find out the number of vehicles you require, divide the number of vehicle days required of each vehicle type by the number of working days in the month (this is usually rounded down to 20) and then round your

calculations to the nearest round number. Table 2 shows how to do this.

Once you have worked out your ideal transport model you can update and adapt it each time that you have new work requirements. The extra vehicle days for each task can be added into the equation and it will become clear whether you can support the work within the existing fleet or whether you will require a new vehicle.

## Developing a transport plan

If you have fewer vehicles than the ideal model then you need to work out if the improvements to health service delivery are worth the costs involved. If they are then a case must be prepared and submitted to the appropriate office. If you have more vehicles than the ideal model and transport needs are not being covered, you need to improve the operational management of your fleet. This may mean disposing of one or more vehicles or increasing your services.

Fill in your office details and the date

# Vehicle inventory

Region Upington  
 Institution Regional office  
 Date 16 May 2000

Note	Vehicle 1	Vehicle 2	Vehicle 3	Vehicle 4	Vehicle 5
Registration	GCD 716 G				
Make	Nissan				
Model/Type	Sentra				
Engine size	1600				
Condition	1 3				
Vehicle based	2 Upington				
Allocated	3 Pool				
Major use	4 1				
Engine no.	123hg222jnj29				
Chassis no.	GHT 36802				
Total kilometres	5 133256				
Average kilometres per month	6 2500				
Average days used per month	7 15				
Main driver	8 3				
Year	1992				
Colour	White				
Fuel type	Unleaded				
Pass capacity	GCD 716 G				
Load capacity	4				
Security systems	-				
Invoice no.	Not known				
Source	DoT				
Date received	Sep 1993				

If a vehicle has a civilian and a government registration then please use the government number.

Make means manufacturer

Model means the type of vehicle i.e. Sentra, Corolla, Citigolf, etc. It is NOT the year of manufacture

Engine and chassis numbers are the unique identifiers for your vehicle in event of theft or need to prove ownership. Remember to record the new engine number if the engine is replaced.

Please enter this information to the best of your knowledge at the time you fill in the form. It is used to set the baseline so that improvements can be measured. An estimate of the average kilometres per month and days used is sufficient. Total kilometres will need to be updated every six months.

Usually petrol, unleaded or diesel

Notes for filling in the form

- 1 1 = excellent (no work required)  
 2 = good (some work required within 6 months)  
 3 = fair (roadworthy, needs major work)  
 4 = poor (unreliable, not for long distance)  
 5 = off road awaiting repair  
 6 = beyond economic repair
- 2 Physical location of vehicle e.g. Brits
- 3 Where the vehicle is allocated e.g. hospital, pool, social welfare, individual
- 4 1 = administration  
 2 = patient transfer  
 3 = meetings/training  
 4 = monitoring/supervision  
 5 = health care delivery  
 6 = social welfare delivery  
 7 - other (please specify)
- 5 Please give current speedometer/odometer reading. Put 'B' if broken
- 6 Estimate the average kilometres travelled by the vehicle in one month
- 7 Estimate the average number of days the vehicle is used in one month
- 8 Identify who normally drives the vehicle  
 1 = government driver  
 2 = mainly one staff member  
 3 = multiple drivers

# How to select the right vehicles

*TRANSAID outlines practical steps to help districts select the right vehicles for their needs.*

Many transport problems in district health services can be traced directly to the selection and supply of inappropriate vehicles. Even in cases where the selected vehicle does not fail, its running costs can be much higher than they would have been if more appropriate vehicles had been selected.

## Principles of vehicle selection

The principles of vehicle selection are similar for all types of transport, from camels to aircraft. There are three stages in the vehicle selection process:

1. defining an operational specification
2. developing a vehicle technical specification
3. selecting the vehicle.

### 1 Operational specification

The operational specification looks at how well the vehicle can do the job it is expected to do. You need to consider:

- ◆ purpose (for example to transfer patients, use in outreach work or carry vaccines)
- ◆ carrying capacity required (for people and/or goods)
- ◆ operating range (distance from base)
- ◆ distances to be covered per unit of time (kilometres per hour)
- ◆ fuel availability (quantity, type and cost)
- ◆ terrain (difficulty and remoteness)
- ◆ climatic conditions (at different times and places)
- ◆ altitude (engine power output reduces as the altitude increases)
- ◆ driver skills (availability and training needed)
- ◆ ancillary equipment required (for example, communications system, security, air conditioning, and safety equipment).

### 2 Vehicle technical specification

The vehicle technical specification describes, in specific engineering and performance terms, a vehicle that will satisfy the operational needs. You need to know, for example, what is the fuel and

engine type, what is the ground clearance, carrying/seat capacity and traction. Some of the calculations necessary to develop a technical specification, particularly for heavy vehicles, are complex and require a basic knowledge of transport engineering. You may need to consult a specialist.

### 3 Vehicle selection

Draw up a list of appropriate vehicles that are available and narrow the list down to no more than three vehicles. To reach this list, review each vehicle against the following criteria:

- a) previous experience – what do you know of its performance in other district health teams or other ministries in your country?
- b) projected economic life – how long will the vehicle run well and economically?
- c) service support – what do you need to ensure that support services are available?
- d) availability of spare parts – are spare parts available and at a cost you can afford?
- e) technical complexity – is the vehicle difficult or complex to understand and maintain, especially if expert knowledge or spare parts are not available?
- f) capital cost – what is the total initial cost?
- g) resale value – how much is it likely to

sell for in the future?

- h) forecast operating cost – how much will the vehicle cost to operate on a daily or monthly basis?

To get the whole life cost of the vehicle compare criteria f, g and h with b. If you compare f, g and h with the number of kilometres covered you get the whole life cost per kilometre of the vehicle. When you do this, you should be able to see which vehicle (or vehicles) are the most appropriate for your transport needs, how much they will cost to run over time and when they are likely to need replacement.

### Vehicle selection: a case study

The Ministry of Health in a west African country wanted to improve outreach services in remote areas. It decided to buy a number of mopeds for the health workers who were mostly women, because the mopeds were cheaper than motorcycles and lighter to handle. However, within one year, most of the mopeds had broken down. Reasons for their failure included:

- ◆ the mopeds were not powerful enough to cope with off-road conditions
- ◆ the mopeds chosen were not found in the country, spares were not available locally and none of the local mechanics were given the training necessary to maintain them
- ◆ there were two small design faults which meant that spare parts were needed regularly
- ◆ riders did not receive enough training in basic maintenance and riding skills.



*The cost per kilometre for an inappropriate vehicle will be much higher than if a more appropriate vehicle had been selected.*

# When to replace a vehicle

*TRANSAID explains how to identify the best time to replace a vehicle – and why this is important.*



TRANSAID Worldwide

*It is not cost-effective to use vehicles once they become cheaper to replace than to repair.*

The point in each vehicle's life when it becomes cheaper to replace than to repair, is known as the economic point of replacement. District health teams need to know when this point is in order to plan how to use their money and other resources most effectively.

Factors that affect the economic point of replacement (see box for an example) include:

**The cost of buying the vehicle** This is also known as the capital cost. It is affected by whether the vehicle is imported, whether hard currency is required for purchase and whether import duties are payable.

**The cost of maintaining the vehicle** The price of spare parts can vary for similar reasons as the capital cost but is less likely to vary if good quality, locally-produced spares are available. The cost of labour also affects the cost of maintenance. For instance, in a country where labour is expensive, the cost of labour can nearly double the cost of maintenance. In a country where labour is cheap, the cost of labour will add very little to the cost of maintenance.

**Planned preventative maintenance** This means following regular maintenance procedures and can double the life of the vehicle. The article on Riders for Health (see pages 6 to 7) gives an example of planned preventive maintenance for motorcycles.

**The cost of fuel** In selecting the appropriate motor vehicle, the relative costs and availability of petrol and diesel must be taken into account. In many cases selecting the more expensive fuel type can double the running cost.

Other influences include the terrain, road conditions, climate, altitude, vehicle loading, the driver's or rider's skills and experience, and the quality of fuel, lubricants, spares and maintenance.

## Calculations

If you have kept data on the cost of fuel, the cost of maintaining the vehicle and the total kilometres travelled, it is quite

**Economic point of replacement: an example**  
In Southern Africa, a Department of Transport buys vehicles that are made in the country, it also keeps the money that it gets from selling the vehicles, but labour costs are high. The economic point of replacement for this fleet is between 100,000 and 120,000 km. This figure is low, because the cost of buying new vehicles is relatively low against the high labour costs involved in maintaining vehicles. Depreciation is also reduced because the Department keeps the sale proceeds.

easy to calculate the point of economic replacement. It is even better if you have historical data for a number of similar vehicles that have all covered a different number of kilometres. Once you have identified the economic point of replacement, this can be used for replacement planning and budget purposes.

**Calculate the cost of fuel per kilometre** by dividing the price of fuel per litre by the number of kilometres travelled per litre of fuel. For example, if you look at the form on page 13, the cost of fuel per kilometre for vehicle GCD 716 G is

$$\frac{2.28}{11.33} = 0.20$$

**Calculate the cost of maintenance per kilometre** by taking the total cost of maintenance (including tyres and batteries) since the vehicle was bought and dividing this by the total number of kilometres the vehicle has travelled.

**Calculate the running cost per kilometre (revenue expenditure)** by adding the cost of fuel and the cost of maintenance.

Running cost per kilometre =

$$\frac{\text{price of fuel} + \text{cost of maintenance}}{\text{fuel utilisation total km travelled}}$$

Then calculate the capital cost per kilometre =

$$\frac{\text{purchase price} - \text{resale value}}{\text{kilometres run}}$$

$$\text{Total cost per km} = \text{running cost} + \text{capital cost}$$

The point at which the total cost per kilometre is at its lowest point is the point of economic replacement. The aim is to minimise the average cost per kilometre of a vehicle over its life. It is a false economy to run a vehicle past its economic point of replacement in order to save capital, or if a replacement vehicle is not immediately available. The overall cost to the organisation will be much higher in the end. Many managers end up spending large percentages of their available budget keeping uneconomic vehicles. It is better to use resources to invest in the planned preventative maintenance of newer vehicles, or if there are none, to look for other available transport, even if this means sharing transport with other departments, hiring private transport or using public transport.

# How to measure performance

*TRANSAID explains how analysing key performance indicators can help managers to identify transport problems and plan action.*

## Vehicle log sheet

To collect the information you need to calculate key transport indicators (see box) you need to make sure that a vehicle log sheet is filled out accurately and regularly each month, even for vehicles that are parked or in for repair. As well as the key transport indicators it should include the vehicle registration number, where it has been allocated or assigned to (this will be an office or duty of the 'pool').

**Kilometres travelled** This can be calculated by subtracting the kilometres recorded at the start of the month from the kilometres recorded at the end of the month. For example, if the number of kilometres recorded at the start of the month was 133,740 and the number of kilometres at the end was 136,232, this would mean that the vehicle had travelled 2492 km that month.

**Fuel utilisation** This means how far the vehicle can travel on one litre of fuel and is calculated by dividing the number of kilometres travelled by the number of litres of fuel used. In the example shown on page 13, fuel utilisation for vehicle GCD 716 G is 11.33 km per litre of fuel.

$$\frac{2492}{219.98} = 11.33 \text{ km/l}$$

The number of kilometres travelled at the beginning and start of the month should be indicated on the vehicle log form. To calculate the number of litres of fuel used, add the amount of fuel in the tank at the start of the month to the fuel added to the vehicle during the month, and then take away the fuel remaining in the tank at the end of the month. For example, if the fuel tank holds 48 litres and it is three-quarters full at the beginning of the month and a quarter full at the end of the month, and 207.98 litres of fuel has been added during the month the sum is:

$$36 + 195.98 = 231.98 - 12 = 219.98 \text{ litres}$$

**Running costs per kilometre** The cost of moving the vehicle one kilometre is calculated as follows:

$$\frac{\text{cost of fuel per litre} + \text{cost of maintenance}}{\text{fuel utilisation} \quad \text{kilometres travelled}}$$

For vehicle GCD 716G this would be:

$$\frac{2.28 + 429.76}{11.33 \quad 2492} = 0.20 + 0.17 = 0.37$$

It can also be calculated as:

$$(\text{fuel used} \times \text{fuel price}) + \text{maintenance cost}$$

total kilometres travelled  
To work out the total maintenance costs for a vehicle you need to keep a monthly maintenance summary sheet that includes all related costs, for example, parts, tyres and labour.

To calculate availability and utilisation we must record how many days the vehicle was used, being repaired or idle. A vehicle was used if it was used for an official task. A vehicle was idle if it was not used or was used for an unofficial task, such as taking someone's children to school. A vehicle was in the workshop if it was being maintained, awaiting repair or awaiting disposal. It is also in the workshop if it does not have a valid license and cannot be driven.

## Key transport indicators

The key transport indicators are:

- ◆ kilometres travelled
- ◆ fuel utilisation (kilometres travelled per litre of fuel)
- ◆ running cost per kilometre (fuel and maintenance)
- ◆ availability
- ◆ vehicle utilisation
- ◆ needs satisfaction.

**Availability** can be calculated as a percentage of the total possible days in the month as follows:

$$\frac{\text{total days in month} - \text{total days in workshop} \times 100\%}{\text{total days in month}}$$

For vehicle GCD 716G, this would be:

$$\frac{30 - 2 \times 100\%}{30} = 93.3\%$$

*You should aim at availability of 80 per cent or more.*

**Utilisation** This means the amount the vehicle was actually used when it was available. It can be calculated by dividing the number of days used by the number of days available and multiplying by 100. For vehicle GCD 716G this would be:

$$\frac{13 \times 100}{28} = 46.4\%$$

*You should aim at utilisation of over 50 per cent.*

**Needs satisfaction** This performance indicator indicates what percentage of the necessary work was done (although it does not indicate the priority of the work), so it comes closest to demonstrating the impact of transport on service delivery. It can be calculated by dividing the number of trips made by the number of trips requested and multiplying this by 100. For example, if 24 trips were requested and 20 trips were made, the needs satisfaction would be:

$$\frac{22 \times 100}{24} = 91.6\%$$

*You should aim at needs satisfaction of 95-100%. If the needs satisfaction is low, you need to review the other indicators. For instance, if the availability is low, there may be a problem with maintainance. If availability is low, with high utilisation, a high number of kilometres travelled and high running costs, the case may be made for replacement vehicles.*

## Monthly summary form

When information from the individual vehicle log sheets is put into a monthly summary form the key performance indicators for all the vehicles can be calculated and analysed. When you reach the column on vehicle availability, the figures for each vehicle should not be added together, instead you need to calculate the total as follows:

$$\frac{(\text{total days in month} \times \text{no. of vehicles}) - \text{total days in workshop}}{(\text{total days in month} \times \text{no. of vehicles})}$$

Fill in the number of vehicles in your fleet and the number of days in the month

# Monthly vehicle report form

Location	Uppington health	Number of vehicles	4
MONTH	May	Number of days in month	30
YEAR	2000	Fuel cost per litre	2.28

Fill in the price of petrol at your location this month. If it varies from place to place, use an average.

Vehicle Running registration no.	Allocated to	Km travelled in month	Fuel used litres	Fuel utilisation km/litre	Availability			maintenance and repairs	Cost of cost per km
					Number of days Used	Workshop	Idle		
GCD 716 G	Pool	2492	219.98	11.33	13	2	15	429.76	0.37
GBF 382 G	Pool	1028	97.32	10.56	18		12		0.22
GSR 984 G	Pool	3272	462.10	7.08	24	2	4	1043.60	0.64
GDB 128 G	Pool	761	123.09	6.18	8		22		0.37
Total (1)		Total (2)	Total (3)		Total (4)	Total (5)	Total (6)	Total (7)	

Use these columns to calculate the numbers

## FUEL UTILISATION

Add up the totals of the columns

Total km travelled in month (2)	7533 km
Total litres fuel used in month (3)	902.5 litres
Average fuel utilisation of vehicles - (2) divided by (3)	8.37 km/litre
Average cost of fuel per km - fuel cost per litre divided by average fuel utilisation	0.27 cost per km

Enter the total carried down from the column containing the same number

## MAINTENANCE COST

Total cost of maintenance and repair (7)	1473.36
Average cost of maintenance and repair per km travelled - (7) divided by (2)	0.20

## PERFORMANCE

No. of trips made divided by no. of trips requested x 100% =

96.25 %

Average fleet running cost per km - fuel cost per km plus maintenance cost per km (12)	0.47
Total monthly expenditure (10) = (12) x (2)	6 747.43
Budgeted monthly expenditure (11)	6 200.00
Budget variance = (11) minus (10)	- 547.43

## VEHICLE AVAILABILITY AND UTILISATION

Figure from location budget

Theoretical vehicle days in month multiplied by (1) = (8)	Calculation of new totals, hence (8) and (9)	-	120	total days
Total no. of days vehicles available - (8) minus (5) = (9)		-	116	days available
Percentage availability - (9) divided by (8)	0.97	x100	96.67	% available
Percentage utilisation - (4) divided by (8)	0.54	x100	54.31	% utilisation

Carry out the calculation as specified in the text



## Do mobile clinics work?

*The African Medical and Research Foundation (AMREF) has been providing services for nomads and pastoralists in Kenya for 40 years. This article looks at one aspect of these services – mobile clinics.*

AMREF first started running mobile clinics in the late 1950s as a way to reach nomadic Maasai communities in Kenya and Tanzania. It also ran clinics by air in Maasailand and in Lamu district of Kenya. It began mobile clinics in Somalia in 1983 and in Turkana, northern Kenya, in 1988.

The Maasailand programme In Maasailand, the mobile clinics, which included a mobile laboratory, were used to deliver preventive and curative health services to remote communities. Detailed data for the period 1986-1994 can be found in annual reports of the Nomadic Health Unit which are available from AMREF (see below).

The clinics were popular and demand was considerable, but there were also the following problems:

**Long delays between clinics** At one stage the base camp moved between three sites: Olkiramatian, Mile 46 and Bissil. The clinic staff stayed at each of these sites for 10-12 days, going out each day to a different village. Each village might be visited only three times a year, for one day.

**High cost of mobile clinics** Each trip or safari cost around US\$10,000 (about 40 per cent on transport, 40 per cent on salaries and allowances, and 20 per cent for everything else). Staff usually saw

100-200 patients per day, or around 1500 in a two-week tour. So each visit cost US\$5 per patient. This is more than the entire annual health budget for each person in Kenya. There appeared to be no way to substantially reduce this cost.

**Complicated logistics** Two fully-loaded Land Rovers were needed to transport a doctor, a clinical officer, a nurse and two or three assistants with all their equipment, drugs, stationery and food. Packing and unpacking both took about an hour, so it was difficult to get more than four hours working time at any one site.

### Project evaluation

The first evaluation in 1984 found the achievements of the mobile clinics remarkable. However, it also found that activities depended upon the dedicated work of two nurses, that the clinics were expensive, were not replicable and were not sustainable in the long-term. Another criticism was the top-down administration of the programme – the activities were based in Nairobi and that the communities served by the clinics were not actively involved.

Two more evaluations in 1989 and 1991 came to similar conclusions. So, AMREF decided to close the mobile services and to provide health services instead from a small dispensary at Entasopia, Kajiado district, in the middle

of the former project area. The newly-created Entasopia community-based project began to look at ways to encourage community participation in improving health.

### Encouraging community participation

In 1992, the local community appointed an advisory committee to help AMREF in its decisions about this project. In 1994, this advisory committee became a government-recognised self-help group. In 1999, the group became a fully independent NGO, the Entasopia Community Development Group. The local community now runs the Entasopia community-based project through the group, which has its own constitution, officers and bank account. The group employs all support staff at the health centre and holds committee meetings every two months. The group still has a strong partnership with AMREF. For instance the Entasopia project leader, Dr Mores Loolpait, and the other professionally qualified staff are all AMREF employees seconded to the Entasopia project. The health centre has recently begun training community health workers.

Many problems remain, and AMREF certainly does not claim to have found all the answers. The Nomadic Health Unit is fairly sure, however, that fostering community institutions and handing over power and responsibility to such institutions is the right way forward. Where mobile clinics are used to provide medical services, the Nomadic Health Unit suggests that these services should be carried out for a limited period, for example five years.

These services should be supported by training for local people, for example training of community health workers and traditional birth attendants. A system of support for these community health workers is also needed, as in the example of the Entasopia community-based project. This will include looking at the transport needs of community health workers in remote areas. The idea is that when the mobile clinics withdraw from the area a sustainable system of community services is in place.

**Dr Basil King, Head, Nomadic Health Unit, AMREF Headquarters, PO Box 30125, Nairobi, Kenya.**

**E-mail: [bking@africaonline.co.ke](mailto:bking@africaonline.co.ke); AMREF Website: [www.amref.org](http://www.amref.org)**

# Community approaches to emergency transport

*A rural health project in northern Kenya called Samburu Aid in Africa (SAIDIA), is using a community health insurance scheme to help support emergency transport.*

Referral (referring people from one health facility to another one which has more appropriate services and a higher level of care) is an important part of primary health care. Many people needing emergency care are unable to benefit from referral services because no appropriate transport is available for them, or because they cannot afford emergency transport. Often, if referral is delayed or does not happen, people die or suffer permanent disability. For instance, a study in a rural area of Zimbabwe with a relatively good basic transport system suggested that lack of emergency transport was responsible for a quarter of all maternal deaths.

## Innovative approaches

To overcome problems like these, some communities have set up emergency loan funds. In Ekpoma, Nigeria, community funds are used to loan money to pay for transport, drugs, blood transfusions and hospital fees for women with obstetric complications. The communities call these loans 'transport loan funds'. In the first year, most of the loans ranged between US\$7 and \$15. Nearly all the 380 women who took a loan repaid it in full.

Another approach is community insurance or risk-taking schemes. For instance in the case of emergency transport, instead of each individual or household paying a large amount of money at a time of crisis they all pay a small amount of money regularly to support the service.

## The SAIDIA scheme

In 1987, SAIDIA introduced a community financing scheme to help cover costs and to encourage local communities to be more actively involved in improving their health. Groups of households called manyattas were invited to become members of the scheme. Members are entitled to emergency referral and free medication while non-members have to pay the full cost of vehicle hire (about Kenya shillings 800) and the full cost of treatment at the SAIDIA clinic or referral facility.

**Cost recovery** Standard membership costs Kshs800 or about US\$16 each year. In 1995, a sliding scale was introduced and resource-poor manyattas, such as those headed by women and widowers, pay a lower premium. Resource-poor manyattas can also pay in kind, for example with goats. The village health committees help SAIDIA decide the standard premium and identify which manyattas should pay a lower premium.

Membership and user fees meet

about five to eight per cent of SAIDIA's total recurrent health programme costs (12 to 15 per cent of SAIDIA's budget for vehicles). The aim is to increase this percentage to 20 per cent within three years. At present nurses have to remember who is insured or not and when fees are due. SAIDIA needs a more exact record of how many manyattas are currently in the locations covered by the project and how many are members, in order to set appropriate premiums. It is considering making fees payable on one or two days a year and of increasing charges for larger manyattas. It is also looking at ways to reduce the recurrent and capital costs of implementing the scheme.

**Community involvement** There is a lot of community support for the scheme. Many families can remember critical occasions when a member of their house-hold has been taken to hospital in a SAIDIA vehicle. Indeed, a number of children have been named Landrover, Toyota or Saidia because they were born after an emergency journey to a hospital. The community identifies the vehicles as 'ours' and many manyatta's have built paths to the main roads to give SAIDIA's vehicles access during emergencies. At any one time between 15 to 40 per cent of manyattas are members. Memberships lapse when people move out of the area temporarily, for example, because of drought, banditry and cattle raids. On the other hand village-to-village awareness campaigns, and the quality of clinic services have encouraged people to join the scheme.

In order to increase membership, SAIDIA is asking questions such as:

- ◆ who are most likely to pay membership and why?
- ◆ who refuses to join and why?
- ◆ are women-headed households more likely to join, as early responses to the SAIDIA scheme suggest?
- ◆ does having a good quality of health services at the referral centre encourage membership?
- ◆ should membership be compulsory?
- ◆ how can the poor be included?
- ◆ what is the fairest method of establishing the premiums for membership?

*Kate Macintyre and David Hotchkiss, Department of International Health and Development, Tulane University, 1440 Canal Street, New Orleans, LA, 70112, USA. E-mail: [kmacint@mailhost.tcs.tulane.edu](mailto:kmacint@mailhost.tcs.tulane.edu), [dhotchkiss@mailhost.tcs.tulane.edu](mailto:dhotchkiss@mailhost.tcs.tulane.edu)*

*For more information on SAIDIA's membership scheme please contact: Mohammed Lochgan, SAIDIA, PO Box 741, Nanyuki, Kenya.*



Kate Macintyre

# Resources

## Organisations

### **International forum for rural transport and development (IFRTD)**

IFRTD is a global network of people and organizations interested in promoting a broader approach to meeting the transport needs of rural people. This broader approach includes a focus on the introduction of intermediate means of transport (such as bicycles, pack animals, and wheelbarrows) to fill the gap between walking and motorised vehicles.

For further information, contact: IFRTD Secretariat, c/o Intermediate Technology, 2nd floor, New Premier House, 150 Southampton Row, London WC1B 5AL, UK. Tel: +44 20 7278 3670. Fax: +44 20 7278 6880.

E-mail: [ifrd@gn.apc.org](mailto:ifrd@gn.apc.org)

Website: <http://www.gn.apc.org/ifrd>

## Printed resources

### **Guidelines for introducing motorcycles into a primary health care programme (WHO/EPI/LHIS/94.10).**

### **Monitoring vehicle use: a guide for transport officers (WHO/EPI/LHIS/94.6).**

### **Advanced driving for health – a manual for instructors (WHO/EPI/LHTM/94.01).**

Riders cards:

- ◆ motorcycle maintenance
- ◆ fault finding chart
- ◆ motorcycle guide
- ◆ moped guide.

This is a set of practical material on transport produced by the Expanded Programme on Immunization (EPI) of the World Health Organization (WHO). For example, the guidelines on motorcycles includes information on selecting and maintaining motorcycles, budgeting for all associated costs, training riders and mechanics, and evaluating and improving the effectiveness of motorcycles in a health programme. The Riders cards are a summary of basic tips in a protective plastic folder (see page 6 of this newsletter).

A limited number of copies are available free from: EPI Documentation Center, WHO, 20, Avenue Appia, CH-1211, Geneva 27, Switzerland. Fax: +22 791 41 93/92. E-mail: [publications@who.int](mailto:publications@who.int)

### **Transport Management Manual, TRANSAID Worldwide, 2000.**

This manual provides comprehensive guidelines on all aspects of transport management for health managers. Includes sections on: who manages transport, transport policy, needs analysis and use, vehicle planning, operational controls, vehicle maintenance, disposal, replacement and allocation, and

management information systems (transport record keeping and improving transport performance). The manual will be published soon.

For further information on price and availability contact: TRANSAID Worldwide, East Side Offices, King's Cross Station, London, N1 9AP, UK. Tel: +44 20 7922 4939. Fax: +44 20 7922 4030.

E-mail: [TRANSAID@compuserve.com](mailto:TRANSAID@compuserve.com)

## Electronic resources

### **Health Training website**

The Health Training website is provided by Medicus Mundi Switzerland (MMS), the Swiss network of organisations dealing with International Health. It provides comprehensive information on postgraduate training and further education opportunities in the field of international health. It also provides links to other training-related websites.

For further information contact: Anita Glatt Benammar and Thomas Schwarz, MMS, Murbacherstrasse 34, CH-4056 Basel, Switzerland. Tel: +41 61 383 1810. Fax: +41 61 383 1811. E-mail: [info@medicusmundi.ch](mailto:info@medicusmundi.ch) Website: <http://www.medicusmundi.ch>

## New publications from Healthlink Worldwide

### **HIV testing: a practical approach**

contains practical information on HIV counselling and testing services for use in developing countries. It is aimed at health workers who provide counselling, testing or laboratory services and NGOs that offer counselling and support programmes. It is a revised version of *Practical issues in HIV testing*, published by Healthlink Worldwide in 1994.

Single copies are available free to indigenous organisations in developing countries with no access to sterling or US dollar currencies. For others the cost is £7.50/US\$15 and includes postage.

### **Children's Health in Emergencies: practical guidelines for health workers**

This special supplement provides practical information on:

- ◆ children's health in emergency situations
- ◆ prevention and management of common illnesses
- ◆ nutrition
- ◆ working with children
- ◆ working with communities and other organisations.

Single copies are available free to indigenous organisations in developing countries with no access to sterling or

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Editor Christine Kalume

Design and production Ingrid Emsden

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