



Emergency Transport Scheme (ETS) Training Guide for Bicycle Ambulance Trainers

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2. List of Abbreviations

BA	Bicycle Ambulance
CF	Community Facilitator
CHV	Community Health Volunteer
DHMT	District Health Management Team
DPC	District Project Co-ordinator
EDD	Expected Day of Delivery
EOC	Emergency Obstetric Care
ETS	Emergency Transport Scheme
HPI	Health Partners International
KABP	Knowledge, Attitudes, Beliefs and Practices (survey)
MCDMCH	Ministry of Community Development and Mother and Child Health
MDG	Millennium Development Goal
MMR	Maternal Mortality Rate
MOH	Ministry of Health
MAMaZ	Mobilising Access to Maternal Health Services in Zambia
MNH	Maternal and Newborn Health
MNCH	Maternal Newborn and Child Health
NHC	Neighbourhood Health Committee
NMEC	National Malaria Elimination Centre
ODI	Overseas Development Institute
PHC	Primary Health Care
PPM	Planned Preventative Maintenance
SMAG	Safe Motherhood Action Group

3. Introduction

3.1 Implementing Partner Organisations

Since 1998, Transaid has been working to address barriers to accessing health services, specifically the barriers experienced by isolated communities where the lack of formal transport services often means available transport is unaffordable to the majority. This has a direct impact on whether or not community members can access local health services. The majority of Transaid's work in this area has focused on addressing high maternal mortality ratios in sub-Saharan Africa by giving women the means to travel to and from maternal health care services when required.

Health Partners International (HPI) has worked on broader health systems and public health issues (including maternal, newborn and child health (MNCH), community health systems strengthening, nutrition, and medicines transparency) in Zambia for a range of development partners for more than a decade. HPI designed and led implementation of the Zambia MAMaZ programme (2010-2013), and was a key implementation partner in MORE MAMaZ (2014-2016), responsible for the community health systems strengthening, district capacity building and national scale-up components. Health Partners Zambia, a wholly owned subsidiary of HPI was established in 2016.

Development Data, a Zambian organisation working on maternal health, and other aspects of health and development, was part of the MAMaZ and MORE MAMaZ consortium. Development Data signed a memorandum of understanding (MoU) with the Government of the Republic of Zambia in 2014 for MORE MAMaZ and is fully registered in Zambia as a private voluntary organisation. The organisation provides technical support in data and information management for development practitioners, including Government departments. Development data is driven by a mission to provide technical expertise in data and information management for development processes in the Southern African region. Development Data has successfully conducted evaluation studies, feasibility studies, knowledge, attitudes, beliefs and practices (KABP) surveys, impact and vulnerability assessments and baseline surveys for various organisations.

Disacare Wheelchair Centre Trust is a registered trust that is involved in manufacturing mobility aid devices. The centre has been in existence since 1991 and has worked with a number of international organisations involved in wheelchair and mobility aid technology. As a result of this work, Disacare is now producing mobility aids which are designed to specifically cope with the often challenging Zambian terrain. A key partner in MAMaZ and MORE MAMaZ, Disacare has achieved a number of accomplishments over the years including having supplied the Ministry of Health with wheelchairs, bicycles ambulances and tricycle crutches. Disacare also built bicycle ambulances for the World Health Organisation (WHO) and in 2009 worked with the WHO to develop guidelines on distribution of wheelchairs in low income countries and to distribute bicycle ambulances to a number of districts in Zambia. Disacare was also one of the consortium members who facilitated the technical support and monitoring on the emergency transport scheme in conjunction with Transaid.

3.2 Mobilising Access to Maternal Health Services in Zambia (MAMaZ)

In 2010 the UK Department for International Development (DFID) funded a three-year maternal and newborn health programme in Zambia called Mobilising Access to Maternal Health Services in Zambia (MAMaZ), a key element of which was the introduction of emergency transport schemes (ETS) which offered women and children under 5 a means to travel to local health facilities. The programme was implemented to support the Government of Zambia's efforts to achieve Millennium Development Goal (MDG) 5, which called for a 75% reduction in maternal mortality by 2015. The MAMaZ programme's contribution to helping the Zambian Government achieve this goal was a 27% increase in women delivering at health facilities, in the presence of a skilled birth attendant in the target districts.

3.3 MORE MAMaZ

To continue the strong work achieved during the MAMaZ programme, between 2014 and 2016 Comic Relief funded the MORE MAMaZ programme and this enabled the transitioning of the MAMaZ demand-side approach from 'proof of concept' stage to implementation on a larger scale. Each MORE MAMaZ intervention district was supported to achieve as close as possible to 100% coverage. New learning and evidence from the five intervention districts¹ was shared with the national government to increase knowledge and understanding of effective ways to intervene at community level in support of improved maternal and newborn health (MNH). The Ministry of Community Development and Mother and Child Health (MCDMCH), was supported to scale up beyond the five intervention districts.

The vast majority of maternal deaths are preventable. With haemorrhage and hypertension being the primary cause in the majority of maternal deaths, access to skilled care during pregnancy and at birth is critical. The delay in achieving access to appropriate care is a key determinant in maternal mortality. The lack of available and/or affordable transport is a key constraint to accessing healthcare. As a direct outcome of the MORE MAMaZ programme, more women travelled to a health facility for delivery (25% increase from baseline) and more women received skilled birth attendance (32% increase)² as a result of the programme's awareness raising and community systems strengthening efforts, which included the introduction of 120 ETS vehicles in five intervention districts. Between September 2014 and July 2016, 4,105 pregnant women benefited from the use of the ETS which continues to be accessible 24 hours a day as a means of emergency transport.

3.4 MAMaZ Against Malaria

MAMaZ Against Malaria (MAM) is a one-year pilot project, funded by the Geneva-based foundation, Medicines for Malaria Venture (MMV). The project, which started in July 2017, aims to devise an evidence-based and sustainable strategy to improve the access of hard-to-reach communities to effective treatment for severe malaria in a high malaria burden setting. The project is being implemented by a consortium led by Transaid in partnership with Health Partners Zambia,

¹ MORE MAMaZ intervention districts were Chama, Chitambo, Serenje, Mongu and Mkushi.

² MORE MAMaZ, 2016, End Line Survey Report, produced by Development Data on behalf of the MORE MAMaZ Programme.

Development Data and Disacare, the same consortium involved in the design and implementation of MAMaZ and MORE MAMaZ. The project, implemented in Serenje District, Central Province, aims to increase access to community-based pre-referral treatment for severe malaria (pre-referral rectal artesunate - RAS) for children from six months to under six years old, and to reduce referral delays from the community to health facilities that are equipped to treat severe malaria, ideally with injectable artesunate. In this project, ETS will be expanded from its primary focus on maternal health, so that children suffering from severe malaria can be referred without delay to the health facility. The project is providing 14 new bicycle ambulances and working with Serenje's District Management Team (DHMT) to refurbish, where needed, bicycle ambulances supplied by MAMaZ and MORE MAMaZ.

3.5 Audience for Training Manual

This training manual is intended for trainers who are conducting training on ETS and introducing bicycle ambulances to help expecting mothers and children with suspected severe malaria access health care in a timely way. The topics in this manual have been logically arranged to help the trainer follow an approach which aims to maximise the impact of the ETS introduction through clear messaging and instruction.

3.6 Purpose of the Training Manual

The purpose of the ETS training is to develop the knowledge and skills of the community volunteer ETS riders so that they can professionally, safely, actively and effectively contribute to reducing maternal delays, and delays affecting children with suspected severe malaria, that are associated with lack of affordable transport.

This manual acts as a learning tool and reference to be used in conducting training geared towards achieving this. It contains the course layout, proposed timings and gives core trainers comprehensive guidance on critical issues relating to the successful operation of a community managed ETS. It is not meant as a document for general distribution among all ETS volunteer riders.

3.7 Training Plan

The ETS training should be structured over two days. A participatory approach is used throughout to ensure maximum learning among trainees.

The training plan can be used flexibly depending on whether or not ETS riders have received previous training in ETS. For those who have, a "light touch" refresher training can be provided, covering the use of ETS for children suffering from severe malaria. The light touch training is for 1.5 days. For newly recruited ETS riders with no prior training, the full training will be provided, covering both maternal health and severe malaria in children. This training lasts for two days.

The following is a suggested training plan:

DAY ONE		
Time	Session	Subjects Covered
45 minutes	1	Introduction Participant's welcome and introduction Introduction to ETS training Training content and objectives
45 minutes	2	Understanding the barriers to accessing transport during a maternal emergency and for children with suspected severe malaria
45 minutes	3	Ensuring easy access to transportation without delay
1 hour	4	Understanding the role of volunteer ETS riders Working effectively with Community Health Volunteers (CHVs)
1 hour	5	Problem solving issues that can cause further delays in transporting women and sick children
1 hour	6	Recognising maternal danger signs³
1 hour	7	Recognising malaria danger signs for children
1 hour	8	Safe lifting of women experiencing maternal complication and sick children & use of stretcher
45 minutes	9	Health and safety considerations

DAY TWO		
Time	Session	Subjects Covered
30 minutes	10	Recap of Day One and Participatory Review Participatory review of course so far
45 minutes	11	Planned Preventative Maintenance
1 hour	12	Reporting and the recording of ETS cases
3 hour	13	Bicycle and bicycle ambulance assembly
1 hour 30 minutes	14	Formulating community systems - action plans on food banks, saving schemes and construction of the BA shelter
1 hour	15	Review and Handover to District Health Management Team

3.8 Training Facilities and Equipment

The environment in which the community training is conducted may differ depending on the available training facilities on the ground. There is need for flexibility from trainers to adjust within the training environment provided at that particular time. If training is conducted in a classroom or conference room facility, encourage the use of flip charts to provide some sort of visual

³ Session 6 is included in the comprehensive training that is given to riders who have not previously been trained in ETS for maternal cases. The duration of the comprehensive training is two full days.

representation of the group discussions which could be displayed on the wall of the training room. However, most training carried out in the community in rural Zambia is held in a communal space which may be outside under the shelter of a tree or in small meeting rooms which do not always present the most conducive training environments. The trainer should therefore be prepared to adjust and adapt.

Most of the training at community level will involve participants with very limited or no reading and writing skills. This may require some adjustments in the training approach to optimise training outputs. Trainers are encouraged to have available and use any project tools such as bicycle ambulance (BA) logbook and maintenance sheets to ensure trainees understand what type of information needs to be captured in the tools.

4. Training Content

4.1 Session 1: Introduction (Day 1)

4.1.1 Session Objectives

This first session aims to build a thorough understanding amongst participants as to the purpose of the training and the overall training objectives.

4.1.2 Welcome and Introductions

The trainer and participants should introduce themselves by name, and, in the case of the participants, which health post and/or neighbourhood health committee they are from. This is also an opportunity for the trainer to carry out an ‘ice breaker’.

Ground rules should be collectively set and agreed upon and may include:

- Mobile phones should be set to ‘silent’
- Show up on time for each session
- Feel free to ask any questions, and every question is important
- Respect the opinions of others
- Limit side conversations

4.1.3 Training Objectives

The trainer should introduce and outline clearly the objectives of the training over the following two days.

The aim is to ensure that training participants will be better able to:

- Appreciate and explain the role of community ETS riders as volunteers and appreciate the benefits of volunteerism in helping to save lives
- Understand how ETS fits into the wider community health systems strengthening efforts that aim to improve maternal, newborn and child health
- Commit to ensure that pregnant women experiencing maternal danger signs and children experiencing the danger signs of severe malaria are transported to the health facility without delay
- Appreciate the difficulties faced by women and children in accessing transportation during maternal and other health emergencies
- Understand the need to respect the confidentiality of any information relating to the transportation of pregnant women and sick children
- Demonstrate how to lift/handle a pregnant woman experiencing a maternal complication and safe handling of sick children
- Demonstrate and explain how to record ETS cases correctly in the logbook
- Agree to ensure that the bicycle ambulances are readily available and in working condition for health emergencies and maintain and service the bicycle ambulances to reduce breakdowns and potential delays in the transfer of ETS patients

- Contribute to identifying ways of working with the families of pregnant women and sick children and the community to reduce transport-related delays to appropriate treatment
- Understand how to introduce ETS in the community
- Understand how to conduct periodic basic maintenance of ETS transport

4.1.4 Introduction to ETS

In communities where no formal transport services exist, and what little transport there is available is not affordable, Emergency Transport Schemes offer a means of transporting community members requiring patient referral to health facilities. ETS is community-owned and managed, and is operated by volunteer riders. The ETS' goal is to reduce the time it takes to get to a health facility in a safe way. The design of the ETS must be appropriate to the local context and take into account terrain and topography as well as culturally acceptable norms. The community identifies people to operate ETS vehicles. ETS riders undergo training to meet the required standard when offering this type of service and pledge to do so on a voluntary basis. The ETS riders play a key role in reducing transport-related delays in the context of maternal and child health emergencies.

4.1.5 The Use of Intermediate Modes of Transport (IMTs)

Bicycle ambulances are an appropriate form of transport for rural parts of Zambia where there is already a strong bicycle culture and limited other transport services. It is essential that as well as being accessible and affordable, the ETS focuses on patient comfort and safety. Patient comfort in the bicycle ambulance is addressed through a suspended stretcher bed. In addition, the removable stretcher allows patients to be safely and comfortably transferred to and from the bicycle ambulance. The canopy cover provides shelter from extreme weather conditions and also privacy for women in labour or sick children during transit. The weight of the bicycle ambulance itself is minimised through the use of a square tube frame, and through the use of fabric for the shelter which is much lighter than using metal sheet. At a weight of about 36 kilogrammes the bicycle ambulance can easily be lifted where obstacles exist. The bicycle ambulance also has good ground clearance when it sits on its 28" bicycle wheels allowing it to move comfortably through uneven terrain (see Annex 2).



The cost of repairs and maintenance is low for these modes of transport, especially in comparison to motorised vehicles, meaning that the community is more able to afford to keep the ETS operational as the skills and spare parts needed are usually available locally.

4.1.6 Note to Trainers

Trainers should maintain a participatory approach which encourages input from participants throughout this and all other sessions. In Session 1 it is essential that participants are confident that they understand the ETS concept. To maximise the chance that everyone increases their understanding, sufficient time should be left for questions.

4.2 Session 2: Understanding the barriers to accessing transport during a maternal emergency and for children with suspected severe malaria

4.2.1 Session Objectives

Participants should appreciate the role of transportation in helping women experiencing maternal emergencies and for children with suspected severe malaria and the difficulties faced in these circumstances, in accessing transportation.

4.2.2 Maternal Mortality

In 2013, the WHO estimated that maternal deaths were more than 14 times higher in economically developing countries than in economically developed countries. In fact, 99% of global maternal deaths occur in developing countries (WHO, 2014). The maternal mortality ratio (MMR) in Zambia is unacceptably high at 398 maternal deaths per 100,000 live births (ZDHS 2013-14) compared with developed countries such as the UK where the MMR is 8 per 100,000 live births.

The vast majority of maternal deaths are preventable. With haemorrhage and hypertension being the primary causes in the majority of maternal deaths, access to skilled care during pregnancy and at birth is critical. The delay in achieving this access to appropriate care is a key determinant in maternal mortality. Thaddeus and Maine introduced the three delays model which has been hugely influential in defining approaches to address the numbers of maternal deaths and in analysis of the barriers to accessing maternal healthcare services (1994). They stated that delays in accessing maternal health services can occur at 3 levels:

1. Delay in the decision to seek care: This is influenced by late recognition of symptoms, a reluctance to travel to health facilities possibly due to cultural norms, or the absence of a decision maker highlighting gender inequity at the household level.
2. Delay in reaching the appropriate health facility: Usually due to the lack of an appropriate means of transport or an inadequate network of health facilities resulting in low coverage.

3. Delay in receiving adequate care once at the health facility: Often caused by a lack of equipment or essential supplies such as blood for transfusions and medicines, or a shortage of staff.

The second delay recognises that transport plays an integral role in influencing the level of access a woman has to maternal healthcare services.

4.2.3 Severe Malaria in Children

Malaria kills one child every 30 seconds, or about 3000 children every day. Over one million people die from malaria each year, mostly children under five years of age, with 90 per cent of malaria cases occurring in Sub-Saharan Africa (Unicef).

In Zambia the national malaria incidence rate (i.e. new malaria cases) for children under five years of age is 756/1000. In Central Province, the incidence rate for children under five years old is estimated as 490/1000.⁴ Severe malaria is a medical emergency: many young children die as a result of delays in starting treatment within the first 24 hours of onset of symptoms, especially in rural areas where physical access and other barriers to timely health care are poor and long delays may occur between a decision to seek care and the receipt of care. There are opportunities, therefore, to expand ETS so that it can cater for children suspected to be suffering from severe malaria.

MAM's baseline assessments have also identified that there are similar delays associated with lack of knowledge, affordable transport, and poverty more generally that prevent children suffering with severe malaria from being diagnosed and treated promptly.

4.2.4 Transport as a Contributing Factor

In many isolated rural areas where there is low demand and inadequate infrastructure, the lack of available and affordable transport services is a major contributing factor to reducing the uptake of essential health services, in turn exacerbating rural poverty. Failure to integrate transport into programmes designed to address the constraints to accessing essential services will reduce the effectiveness of community-based efforts that aim to improve maternal health through increasing uptake of institutional deliveries and increase the access of young severe malaria patients to essential treatment.

Murray and Pearson (2006) state that transport strategies implemented alongside other interventions could contribute to as much as an 80% reduction in maternal deaths. Barriers to access such as transport can increase the clinical severity of cases particularly where complications exist. Recent research by Transaid (2013) in partnership with the Ghana National Ambulance service and the State Ministry of Health in Katsina State, Nigeria found that women with access to motorised means of transport for referral arrived at a referral facility in significantly better health than those without such means. As yet, there is no such research that focuses on the role of ETS in increasing

⁴ Inambao AB, Kumar R, Hamainza B, Makasa M, Nielsen CF, 2017, 'Malaria Incidence in Zambia, 2013 to 2015: Observations from the Health Management Information System', **Health Press Zambia Bull.** 2017;1(3).

access to services and improving health outcomes in the context of children suspected to be suffering from severe malaria.

4.2.5 Note to Trainers

The trainer should encourage four or five of the participants to share their experiences with the group. This should be a reflection on an experience where someone close to the participants or someone living in their community experienced a maternal complication, or where a child died from severe malaria, cases that could have been prevented if transport was available at that time

The following questions could be asked to the wider group after experiences have been shared if appropriate:

- What factors could have improved the outcome of this experience?
- How would the experience have been different with access to an affordable means of transport?

In bringing this session to a close, the trainer should summarise the key points and emphasise the important contribution that communities can make to improve the outcomes of maternal and child health emergencies.

4.3 Session 3 Ensuring easy access to transportation without delay

4.3.1 Session Objective

Participants will build on their understanding of the important contribution that ETS riders can make in improving access to transportation during maternal emergencies and in cases where children are suspected of having severe malaria.

4.3.2 Group Work

For the purposes of this session, participants will be split into two or three groups. Trainers will allow 20 minutes for discussion within each of the groups whereby the ways in which ETS riders can contribute to improving access to transport will be discussed.

At the end of the discussion, each group will nominate one or more representative who will conduct a five-minute presentation on the findings from the groups discussions to all participants.

4.3.3 Note to Trainers

It is perfectly acceptable if participants are more confident presenting in a group for them to do so.

4.4 Session 4: Understanding the role of volunteer ETS riders

4.4.1 Session Objectives

This session will discuss the advantages of volunteerism as well as the desired attitudes of the riders volunteering to participate in the ETS. It will also discuss the role of ETS riders in relation to the other volunteers and systems in the community that are working to improve maternal and child health.

4.4.2 Group Discussion

The trainer should encourage the group to reflect back to experiences participants have had in their various communities, do they know of people who gave their time and other resources to volunteer in the community?

If so, the group should answer the following questions to build a collective understanding of volunteering:

- Why do people volunteer their time, services or resources?
- Are there any advantages in volunteerism? Say what these are?
- What are the challenges when it comes to volunteering?

Further discussion could follow the following guidance:

- What are some of the expected advantages to ETS riders volunteering their time and services in the ETS?
- What are some of the desired characters and qualities of riders volunteering their services in the ETS?

4.4.3 Why Volunteer?

Volunteering is vital to the sustainability of the ETS. If monetary incentives are used then there is the chance that a lack of funding in future would lead to the collapse of the ETS.

This initiative works according to the following assumptions:

- People are more likely to offer their time and money in a voluntary capacity for services and/or projects in their communities.
- The driving force behind volunteerism for community services and projects is services to humanity and the desire to contribute to the development of the community.
- Financial reward should not be expected by those working in a voluntary capacity. People do not volunteer because of the expectation of financial reward or reward in kind.
- Volunteerism has its ‘moral’ benefits. For example, one good turn deserves another; if you help a woman or child today, someone else may help your sister, your wife or your mother during an emergency.
- Volunteering in the ETS is an honourable thing to do because it is contributing to saving lives.

Volunteer ETS riders are expected to have the following special qualities:

- They are concerned for preserving life
- Kind
- Patient
- Considerate

4.4.4 How ETS riders fit with other community health volunteers and community systems

ETS riders are part of a larger community-based effort that aims to save the lives of mothers and children. ETS riders should know that:

- They should work closely with the CHVs in their area to ensure that patients are identified, pret-treated with RAS as appropriate and referred to the ETS as quickly as possible
- Where appropriate, invite CHVs, especially those who are mother's helpers, to accompany the woman or child to the health facility
- Food banks are available in the community to support pregnant women and the families of children who are suspected to have severe malaria. Riders should know how to access these schemes so that they can pass the information onto the patient or the patient's family
- Emergency savings schemes are available in the community to support pregnant women and the families of children who are suspected to have severe malaria. Riders should also know how to access these schemes
- ETS works best where ETS riders and CHVs work together, share information, and support each other

4.4.5 Note to Trainers

The trainer should be as clear as possible in communicating the fact that there is no financial reward to ETS riders to avoid problems later.

4.5 Session 5: Problem solving issues that can cause further delay in transporting women and sick children

4.5.1 Session Objective

Participants will discuss reasons why transportation delays sometimes occur in the community, and some of the challenges that ETS riders may encounter in their own communities. Ways of mitigating these challenges will be discussed.

4.5.2 Group Discussion

There are a number of reasons why delays might occur in helping transport pregnant women or sick children. For example, delays may be caused due to the bicycle ambulance needing a spare part or cultural factors may present a challenge to using the ETS:

<i>Problems</i>	<i>Possible Solutions</i>
There may be a misconception that ETS riders are paid to carry out their	Community leaders, the DHMT and other CHVs working in the

role	community should clearly communicate the fact that ETS riders are volunteers
The ETS rider might not be available when a health emergency occurs	CHVs and community leaders should have a close working relationship with the riders; they should always know when a rider is out of the village and identify alternative riders
CHVs may delay bringing a sick child or pregnant woman to the ETS rider	CHVs and ETS riders must work together closely to ensure that there are minimal delays for women and children
Women or the families of sick children refuse to use the ETS	Community meetings can be held to understand the reason for low uptake of the service and to discuss the importance of women giving birth at the health facility, and children being taken promptly to the health facility. Demonstration rides can be conducted in the community to help them become familiar and comfortable with the system
Communities do not appreciate the services provided by the ETS rider	Community leaders and other ETS partners should arrange for community meetings where riders' contributions are acknowledged and recognised

In this session participants are expected to discuss and identify such problems and will also agree on solutions.

Participants will be split into two or three groups and asked to identify and list possible challenges which could lead to delays in transporting ETS clients in need of emergency care. Groups should be allowed 10 minutes before presenting their findings to all participants.

Participants will then return to their groups to consider what the solutions might be to each of the challenges that they have identified. Groups will again be allowed 10 minutes for this discussion before presenting their findings to all participants.

4.5.3 Note to Trainers

Add to the list of likely challenges and ways of mitigating them if key factors are not mentioned as part of the discussion.

4.6 Session 6: Recognising Maternal Danger Signs

4.6.1 Session Objective

By the end of this session participants will be able to recognise the 9 maternal danger signs in women. CHVs will be trained to recognise the danger signs. However, it is also important for the ETS riders to understand these signs so that there are no delays in transporting women to the health facility.

It is important that ETS riders know about the eight maternal danger signs.

4.6.2 Presentation

- We have discussed from our own experience some of the danger signs that tell us the life of a woman and her baby is in danger.
- Some of these danger signs occur from the beginning of pregnancy, during childbirth and after childbirth for the first 42 days.
- The doctors have identified eight danger signs to watch out for during the maternal period from the beginning of pregnancy, during childbirth and after childbirth for the first 42 days.
- A woman who has any of these eight signs before, during or after childbirth must be rushed to the hospital. The doctors and midwives can save her life and her baby's life.

THE EIGHT MATERNAL DANGER SIGNS

1. Fitting (often preceded by severe headache and swollen feet, face & hands)
2. Swollen feet, hands and/or face (fitting may start soon)
3. Severe headache (fitting may start soon)
4. Fever/chills (with or without foul smelling discharge)
5. Severe bleeding
6. Prolonged labour (more than 12 hours)
7. Hand, foot or cord comes out first
8. Placenta does not come out 30 minutes after childbirth

4.6.3 Note to Trainers

Use the "Say and Do" body signs while you talk about these signs (see Say and Do instructions below).

Use the rapid imitation method to teach the maternal danger signs. The **rapid facilitation imitation method** described below ensures that each participant learns how to demonstrate each maternal danger sign. Repeating the demonstration of each sign makes it easier for participants to easily remember and recall the danger signs.

1. Facilitator says she/he will lead and asks participants to imitate her two times.
 - Facilitator demonstrates a sign.

- Participants imitate facilitator 2 times.
2. Participant demonstrates:
- Facilitator notes a participant who is doing a sign well and asks her/him to move one step into the circle in order to demonstrate the sign.
 - Facilitator asks participants to imitate the participant demonstrator two times.
 - Participant leads everyone two times.
3. Volunteers demonstrate each sign:
- Facilitator asks for volunteers to demonstrate a sign.
 - Volunteer moves one step into the circle and demonstrates a sign.
 - Volunteer leads everyone two times.
4. Facilitator leads all the participants to demonstrate the key danger signs together.
- Participants imitate her/him two times.
5. Practice each danger sign pose, one at a time.
- Continue using this rapid imitation method until all the dangers signs poses have been learned.

'SAY AND DO' DEMONSTRATION	
The Eight Maternal Danger Signs Poses	
<i>Instructions for Trainers</i>	
<ul style="list-style-type: none"> • Trainers need to learn the eight maternal danger sign poses in advance of this session. • While the actions are being demonstrated, trainers say what the pose is several times e.g. “Fever. Fever with foul smelling discharge; Fever. Fever with foul smelling discharge; Fever. Fever with foul smelling discharge.” 	<ol style="list-style-type: none"> 1. Fitting: Hold your hands up in the air and let your head fall to one side while shaking your hands and whole body. 2. Swollen feet, hands and/or face: Touch the places that will be swollen one after the other. Touch the top of your foot; hold one of your wrists; put your hands on the sides of your face and puff up your face. 3. Severe headaches: Hold the side of your hand on your forehead pretending to have a terrible headache. 4. Fever/chills (with or without foul smelling discharge): Cross your arms on your shoulders and shiver; then hold your hands flat, face down above your lap and push away from your body to show that there is flow away from the womb; wave your right hand down from your

- lap area with a facial expression of a foul smell to show that the flow from the womb has an offensive odour.
5. **Severe Bleeding:** Hold your hands flat, face down above your lap and push away from your body to remind us that the blood flows away from the womb.
 6. **Prolonged labour (more than 12 hours):** Put your two knees on the floor, hold tightly to the right side of your waist, press your left hand on the floor and wriggle in pain.
 7. **Hand, foot or cord comes out first:** Push your right hand out in front of you; push your foot out in front. Pull your hand out from your belly button.
 8. **Placenta does not come out 30 minutes after childbirth:** Be on your two knees, hold out your two hands in a receiving position above your lap and open out with an expression on your face showing anxiety.

4.6.4 Summary

The riders are required to know all the maternal danger signs. However, due to the duration of this training we do not expect them to be at the same level as the SMAGs and the methodology of this session is a lighter touch. The core work of the riders is to provide transport and in this case the nature of this session is to provide an orientation so that they have a broad overview of the maternal danger signs.

4.7 Session 7: Recognising Malaria Danger Signs in Children

4.7.1 Session Objective

At the end of this session participants will be able to recognise the severe malaria danger signs in children aged six months to six years. CHVs will be trained to recognise the severe malaria danger signs in children. However, it is also important for the ETS riders to understand these signs so that there are no delays in transporting children suspected of having severe malaria to the health facility.

4.7.2 Group presentation

The trainer should split participants into smaller groups and try to evaluate their knowledge on severe malaria danger signs before engaging them into the details in the table below⁵. Each group should explain what they understand about malaria and the recognition of danger signs indicative of this condition. Trainers should then demonstrate using "Say & Do" the severe malaria danger signs.

Say & Do Demonstration	
Severe Malaria Danger Signs	
Say	Do
"Child has fever"	<ul style="list-style-type: none"> ▪ Cross your arms and place your hands on

⁵ The table and its contents are extracted from the MAM RAS and Community Training Manual for Community Health Volunteers (2017).

<p>Repeat x 3</p> <p>"It is severe malaria when fever comes with one or more of the following four danger signs"</p>	<ul style="list-style-type: none"> your shoulders ▪ Shiver, moving your body from side to side ▪ Do the action once and repeat three times
<p>"Child is refusing to eat or drink"</p> <p>Repeat x 3</p> <p>"It is severe malaria when fever comes with refusing to eat or drink"</p>	<ul style="list-style-type: none"> ▪ Hold both your hands under your left breast and turn your face to the right side ▪ Move your right hand towards your mouth and quickly turn your head towards the left side
<p>"Child is vomiting everything"</p> <p>Repeat x 3</p> <p>"It is severe malaria when fever comes with vomiting everything."</p> <p>"The child who is vomiting everything cannot hold down any food or drink"</p>	<ul style="list-style-type: none"> ▪ Lift up your head and open your mouth ▪ Bend down your head with your mouth open, pretend to empty out your chest and stomach showing vomiting ▪ Quickly do the emptying three times
<p>"Child is fitting"</p> <p>Repeat x 3</p> <p>"It is severe malaria when fever comes with fitting"</p>	<ul style="list-style-type: none"> ▪ Hold your hands up in the air and let your head fall to one side while shaking your hands and whole body at the same time
<p>"Child is difficult to wake up"</p> <p>Repeat x 3</p> <p>"It is severe malaria when fever comes with difficulty waking a child up"</p>	<ul style="list-style-type: none"> ▪ Slant your head to the right side of your body ▪ Close your eyes ▪ Allow both hands to drop down loosely
<p>"When fever comes with one or more of these other danger signs, it is likely severe malaria and is a medical emergency"</p>	

4.7.3 Notes to Trainers

It should be remembered that the responsibility of ETS riders is primarily to transport people to and from health facilities. However, a rudimentary understanding of severe malaria danger signs is desirable.

4.7.4 Summary

All participants should have good knowledge on how to support communities in identifying and confirming all the danger signs listed in the table above. It should be noted that having undergone

this training session, ETS riders are not expected to have the same level of knowledge on this subject as other trained CHVs.

4.8 Session Eight: Safe-lifting of women experiencing maternal complications and sick children & use of stretcher

4.8.1 Session Objectives

Participants will be able to ensure that pregnant women experiencing maternal complications are safely lifted while reducing the dangers associated with lifting heavy things such as muscle strain. This session is very important because women must be lifted safely but at the same time the ETS rider must ensure that it is done properly without the risk of injuring both the pregnant mother and themselves. This session will also focus on how to lift sick children carefully - and, if necessary, how to transport them to a health facility with their carer. This session involves a lot of practical sessions and should be done in open spaces to allow everyone ease of movement in demonstrating what they are learning.

4.8.2 Group Discussion

The trainer should ask for two or three volunteers to share what problems they may anticipate when lifting women who are experiencing maternal complications, or children who are suspected of having severe malaria. Then ask the following questions to the wider group:

- Why are they lifting pregnant women in that way (trainer should note that sometimes there could be traditional norms which guide people to do things in a particular manner)?
- What did the volunteers do incorrectly in lifting or handling the pregnant woman/women experiencing maternal complications?
- What was the outcome?
- What should the rider have done?
- What would have been the more appropriate way of lifting the pregnant woman/women?
- Did the rider take any steps to correct his or her mistakes?
- If yes, how did the rider correct his or her mistakes?
- Why are they lifting the sick child in that way?
- How are they dealing with the sick child and their carer?

If possible, the trainer should then ask for two or three volunteers to share positive experiences of lifting women experiencing maternal complications or sick children. After the volunteers have shared their positive experiences ask the following questions to the wider group:

- How does this method of handling compare to the methods used in the experiences shared earlier?
- From the different experiences shared, what have we learned about lifting/handling pregnant women experiencing maternal complications or sick children?
- What are some of the appropriate ways of lifting/handling pregnant women experiencing maternal complications?

4.8.3 Demonstration of Lifting Techniques

The trainer should demonstrate each of the correct lifting techniques for moving pregnant women into and out of a vehicle, and also demonstrate how to appropriately handle a sick child and their carer.

A woman who is already in labour could be lifted using fabric/a sheet as a make shift stretcher onto bicycle ambulance stretcher with the assistance of family members. The woman should not be seated in an upright position. She should be supported by her side preferably with the assistance of the mother's helpers where available. In cases where childbirth is well advanced the life and safety of the baby should be considered a priority. A woman who is bleeding should not be refused help. Bicycle ambulances can be cleaned afterwards and should generally be done so before and after transportation of women. Always remember that the woman and baby could die if left unassisted.

A sick child will most likely need to be accompanied to the health facility by their carer. The ETS rider should make sure the carer is seated comfortably and that the child is made as comfortable as possible. There may be occasions when it is not possible to carry both the carer and the sick child in the bicycle ambulance. In these instances, ETS riders might want to explore if the child can be carried on the back of the carer on one of the supporting ETS bicycles. For larger children, the carer may need to accompany the BA on a bicycle. Trainees should be encouraged to talk about how the BA can best be used in these instances.

4.8.4 Note to Trainers

Repeat the lifting techniques a number of times using all participant volunteers. For details on safe lifting of patients refer to Annex 5.

4.9 Session 9: Health and Safety Considerations

4.9.1 Session Objectives

Participants should acknowledge that safety concerns do exist and the importance of applying basic principles in overcoming these concerns, including the way passengers are treated when in transit.

4.9.2 Group Discussion

The focus of this discussion applies to universal safety concerns that should be taken into account during travel, and not just specifically safety concerns related to ETS transportation. In facilitating a discussion on health and safety rules, participant experiences should be shared with the following questions acting as a guide:

- What happened to the vehicle?
- If the vehicle caught fire what did you do to stop the fire and how long did this take?
- If the vehicle had a crash, what was the cause and how did you handle the problem?
- Did you have passengers, particularly a pregnant woman in the vehicle?
- Were they frustrated with the delay?
- What happened to the passenger that was in the vehicle?

- Did the problem cost money to fix?
- Did anybody lose his/her life?
- Could the problem have been prevented?
- What safety lessons did you learn from the problem?

4.9.3 Road Safety: World Health Organisation Data (2015)

- An estimated 1.24 million people are killed every year worldwide from road traffic crashes
- This is equal to 3,500 road related deaths every day
- 20 to 50 million people are injured or suffer long term disability as a result of road crashes each year
- The most vulnerable groups are pedestrians or passengers
- Ambulances in the U.K. are 18 times more likely to be involved in road traffic crashes than private vehicles

4.9.4 The Cost to Families

- Road crashes are the single largest killer of young people aged 15-29
- 59% of road deaths are people aged 15-44
- Road crashes have the potential to plunge households into poverty as the family's main earner is the most likely to get killed or injured

4.9.5 Group Work

Trainers should encourage participants to discuss the causes of safety and road safety problems.

Participants should be asked to tell their experiences of road traffic crashes and in their opinion, what the causes were, e.g. speed, fatigue, alcohol, drugs, dangerous overtaking, harsh breaking, not obeying road traffic signs, unfamiliarity with the road/environment, poor condition of vehicles, use of mobile phones, inexperience etc.

Participants could be asked to consider the following:

What can you do as a rider to improve safety when carrying a pregnant woman or sick child?
If you do these, what benefits will your actions bring to your community and to you personally?

4.9.6 Universal Safe Driving Principles

- Ensure you maintain a speed appropriate to the road/environment
- Do not drink alcohol or take drugs when transporting women or sick children
- Do not use your mobile phone when riding (pull over and stop)
- Obey road traffic signs and markings
- Ensure your vehicle is fit for use

4.9.7 Note to Trainers

Trainers should conclude this section reminding participants that road crashes are preventable with human error often being the principal cause.

4.9.8 Customer Service

ETS riders can be said to be serving their customers, the customers in this case being the pregnant women travelling to maternal health services or children showing danger signs of severe malaria and their families. Good customer service should govern the way and manner the ETS rider treats the passenger so as to make them happy and comfortable during the journey.

4.9.9 Group Work

The trainer should ask four participants to tell the group suggestions about what they could do to make the patient happy and comfortable. Some ideas are:

- Be polite and professional at all times
- Try to be reassuring at all times - the patients or their carers may be very anxious
- Keep the patient and/or their carers talking to take their mind off the situation
- Give updates on the distance travelled and how far is left to travel
- If possible, and when safe to do so, phone through to the health facility to give them an update on arrival times. This will reassure the patient and/or their carers and importantly give the facility advance warning

4.9.10 ETS Rider Pledges

ETS riders are encouraged to make the following pledges to their passengers:

- Work hard at integrating my services within the community where I live
- Work hard at providing steady and consistent levels of customer service, especially to pregnant women and sick children
- Transport pregnant woman and sick children in a safe manner
- Keep details relating to their patients confidential
- Record the number of pregnant women and sick children carried to health facility in the log book provided
- Be polite, listen to the patient's complaints and be prepared to help them at all times
- Try to make travel as comfortable as possible for the passenger by not over speeding, not smoking or drinking alcohol or taking drugs
- Be prepared to work with the community leaders, nurses, midwives and other health workers
- Ensure that the bicycle ambulance is always in good condition
- Lead by example as an ETS registered rider

4.9.11 Professionalism

ETS riders should consider themselves as professionals and should therefore try to carry out the following to serve as good examples to others:

- Always clean your bicycle ambulance
- Ensure that you check your bicycle ambulance before use
- Always obey traffic rules and regulations
- Do not smoke, drink or take drugs when riding
- Do not use worn out tyres

- Keep records of the number of pregnant women and children you transport to and from health centres and the kilometres covered during the transfer

4.9.12 Note to Trainers

Trainers should bring this session to a close by summarising the main points and emphasise the importance of taking the time to reassure the passenger. Ensure everybody understands the need to keep issues relating to patients confidential.

4.10 Session 10: Recap of Day one and Participatory Review (Day Two)

4.10.1 Session Objectives

Group to revisit the content covered during day one to ensure everyone understands all the subjects covered.

4.10.2 Note to Trainers

The trainer should ask questions about the first day's topics, session by session using the manual as a guide. Ensure that everyone gets a chance to answer at least some of the questions.

By the end of this session the trainer should be confident everyone is at an acceptable level.

4.11 Session 11: Planned Preventative Maintenance

4.11.1 Session Objectives

Participants should develop an appreciation of the importance of conducting pre-drive checks and carrying out regular servicing. An understanding of the potential delays incurred by maintenance problems should be grasped.

4.11.2 Group Discussion

The trainer will encourage four-five participants to share their experiences of vehicle maintenance issues.

Participants will spend two minutes thinking of previous experiences they have had in the past where poor maintenance has affected them. The volunteers should be ready to share their experiences with us. Each one of the volunteers will tell the group what happened and in telling the group their stories they should try to include the following where possible:

- What were the circumstances?
- If the vehicle stopped completely how long did it take to get the vehicle moving again?
- Did you have passengers, how did the delay make you feel?
- What would have happened if a patient was in the vehicle?
- Did the problem cost money to fix?

- How could the problem have been prevented?
-

4.11.3 Note to Trainers

The trainer should present his or her own examples of where poor maintenance affected them e.g. within another donor funded project there was an instance where a Ministry of Health driver did not check the water in his radiator before leaving the office. He travelled with some staff across very difficult terrain. The vehicle broke down due to overheating. The vehicle and people were stuck on the road between two towns. Another vehicle was sent by the project to rescue the vehicle and its passengers. The vehicle which broke down was a new Land Rover. The cylinder of the engine was damaged; repairs were estimated to cost a lot of money when this could have been avoided. If a patient had been in the vehicle the delay may have further complicated their problem.

4.12 Session 12: Reporting and Recording ETS cases

4.12.1 Session Objectives

Participants will learn how to complete log book entries, to accurately record data related to the women and children who are transported. They will also learn about the importance of keeping correct records. An example of a log book can be found in Annex 2.

4.12.2 Introduction

As the trainer introduces this session, he or she should ask participants the following questions:

- Why do we need to keep records of the pregnant women or sick children that we transport to the health facilities?
- What information do we have to show in our ETS records?
- Why do we have to show that information?
- What should we do with our ETS records?
- Who do we submit our ETS records to?

Discuss with the participants the answers to the above questions. The trainer should guide participants to better appreciate the reasons for record keeping and the basic principles in ETS recording using materials.

ETS riders are expected to keep records of each ETS case in his or her ETS logbook which should be logged at the first available opportunity after a woman or child has been transported to a health facility. If an ETS transfer is not recorded in the logbook, then it cannot be counted officially by the District Health Management Team (DHMT).

4.12.3 Group Work

The trainer should initiate a group work exercise using a log book format to familiarise participants with completing an entry correctly.

This exercise can be carried in small groups each of which should be encouraged to make three or four log book entries, supported at all times by the trainer where needed.

4.12.4 Note to Trainers

The trainer should refer to examples on the logbook throughout this session to ensure that everyone understands what information is required and how to enter all that in the logbook. In bringing this session to a close, the trainer should explore low levels of literacy as a constraint to completing log book entries and potential ways of overcoming this situation, e.g. seeking the assistance of another colleague.

The trainer must also understand what data are being collected by CHVs, and know about the counter-referral forms that have been designed by the DHMT to record the treatment that is given to patients who are referred from the community. The ETS riders should also be informed about these other data collection efforts, without over-burdening them with too much information.

The trainer should also emphasise the point that if the trip is not recorded in the ETS logbook by a rider, then it's just as good as it did not take place.

4.13 Session 13: Bicycle and Bicycle Ambulance Assembly

4.13.1 Session Objectives

Participants should be confident that they have familiarised themselves with the bicycle and bicycle ambulance components and are able to assemble the equipment so that it can be used as a unit.

4.13.2 Demonstration of Bicycle and Bicycle Ambulance Assembly

The trainer should gather participants around the dismantled bicycle ambulance to explain piece by piece. This is usually best done with support from the company which manufactures the bicycle ambulance. Find enough space for this activity outside of the classroom environment.

After explaining everything piece by piece the trainer should let participants assemble their own bicycle ambulances under supervision to ensure it is being done correctly. Note that a common mistake is to confuse the positioning of the hinge when connecting the trailer to the bicycle. The trainer should supervise this carefully to ensure the trailer is safely connected to the bicycle. For more details refer to Annex 6.

Step 1

Form people into groups in an open space where they will have enough room to display all the vehicle pieces. This is based on the assumption that all the vehicles will arrive in pieces and will be assembled during training.

Step2

Start putting all the pieces together according to instruction from the trainer. Mistakes are common while assembling the vehicle and therefore ongoing monitoring of assembly by the trainer is important in order that parts are not damaged or assembled incorrectly.

Step 3

After finishing the assembly of the vehicle, ensure that the trainer quality assures the way in which the vehicle has been put together before it is taken for a test ride.

Step 4

Demonstration, the rider should take the vehicle for a test ride and ensure that they familiarise themselves with the vehicle.

After assembly has been completed to the trainer's satisfaction, allow participants to carry out a test ride and ask about their first experience from the test rides, particularly how they feel handling the vehicle. Focus on the weight of the vehicle and the implications this has when turning sharply.

4.13.4 Bicycle Repair and Maintenance

This session involves practical work to ensure all the participants develop the skills and knowledge needed to carry out repairs. Annex 5 shows the various parts of a bicycle, many of which are mentioned below. All repairs conducted must be recorded using a maintenance record form (Annex 3) so that ETS repair costs are understood and planned for.

4.13.5 Patching the Bicycle Tube

Put lots of air into the tube until its fully inflated and you will identify the leaking point. The hole should be noticeable, but if not, you can put the whole tube under water and look for air bubbles coming out.

Unless you have glueless patches follow this procedure exactly:

After identifying where the hole is, deflate the tyre and make sure the outside of the tube is dry. Using the sandpaper, a metal scraper or something rough, buff the tube around the area of the hole to remove the outer surface of the rubber and reveal fresh rubber underneath. Make sure to buff at least as large an area as the whole patch will cover. If you use a metal scraper be careful not to cut deep enough to create new holes.

Put glue over the buffed area. Work only in a well-ventilated area. Let the glue dry fully. This kind of glue, also called contact cement, must dry completely before applying the patch. Peel the foil or the plastic backing off the patch and press it firmly on the glued area. Do not touch the side of the patch which sticks to the glue because even a small amount of material on your fingers deactivates its stickiness.

4.13.6 Installing the Bicycles Tyre and Tube

Check the rim strip, the rubber, cloth or plastic covering over the spoke nipples to be sure it is in good condition and in proper position. Look at the outside of the tyre while feeling around the inside

(carefully) to see whether the puncturing object is still stuck in the rubber. If the tyre has a large hole you may be able to shore it up temporarily. Place a square of cloth between the tyre and the tube. The air pressure will hold it in place. Pump just enough air into the tube for it to take its doughnut-like shape. Place the inner tube fully into the tyre. Push the valve about half way into the valve-hole on the rim. If you have trouble getting it in, lift up the rim strip first and push the valve through the rim strip, then into the rim. Then slip the bottom side of the tyre into position onto the rim. The last little bit may be difficult to slip over the edge of the rim. Resist the temptation to use a tyre lever to pry it on. This may damage the tyre edge, or you may slip and put a hole in the tube. It is almost always possible to get the tyre on entirely by hand if you force just an inch or two at a time over the rim using your thumbs. Practice helps more than strength. Except with a thin racing tyres, almost no strength is needed.

Now put the top side of the tyre on the same way. If you have trouble then make sure there is not too much air in the inner tube. Also check to see that the tyre goes on properly. Sometimes the tyre won't drop fully into position on the rim near the valve. This is why you put the valve half-way into its hole at first to help prevent the tube getting caught between the tyre and the rim edge.

When the tyre is installed, gently pull and wiggle the valve stem into position. Put just a little air into the bicycle's tyre (about ten pounds per square inch). Look at the tyre all the way around and on both sides to be sure it is seated properly. If there is a section of tyre that is trying to bulge off the rim let the air out and fix this area by pushing it into position. Once you are satisfied with the tyre installation, inflate the tyre to full pressure. Do this slowly periodically checking that the seating is still correct. The proper pressure should be written (vulcanized) on the side of the tyre.

One common problem which can occur is when the tyre does not fill up entirely in one area giving you a wheel with a flat spot. Sometimes this can be cured by letting the air out and manipulating the tyre by hand, pushing it into place and then re-inflating. If this does not work, one approach is to coat the edges of the rim with soapy water to lubricate the tyre and rim allowing the tyre to slip into position as you inflate it. Use a kind of soap that dries up. Some mechanics just exceed the recommended pressure for a short while until the tyre pops into position but this risks damaging the inner-tube.

4.13.7 Bicycle Ambulance Care

Clean the bicycle ambulance stretcher using a damp soft cloth with some detergent after every use. Always check if the wheels are tightly fixed before using. Try to keep the ambulance in the shade when not in use to avoid the paint peeling off and sun/weather damage. Try to always keep it out of the rain to avoid rust. Check the wheels and oil/grease every month. Keep the canopy and the stretcher away from direct sun light after use. Always ensure that the ambulance is securely connected to the bicycle before use. For repair of wheels, refer to the notes above.

4.13.8 Who should be the Custodian of the Bicycle Ambulance?

The decision as to who will look after the bicycle ambulance should be community-led. It must be someone trustworthy who will not use the vehicle for their own personal interest. This is an important decision and should be discussed in depth until the participants reach a consensus.

Everyone must understand that they have equal access to the vehicle and that they are free to request the vehicle's use whenever the need arises. The bicycle and the trailer should always be kept in the same place so that the BA is ready when needed in an emergency.

4.13.9 Who repairs the vehicle when it breaks down?

As part of this process ownership of the vehicle is transferred to the community. Therefore, the community needs to understand that it is responsible for carrying out maintenance and spare part replacement when the vehicle develops a fault. During this session the participants should be encouraged to discuss what mechanisms should be in place to ensure that the vehicle is operational at all times.

This session should also cover the need to clean the vehicle every time it is used and before and whose responsibility this should be. It is the role of the community to ensure they source cleaning chemicals to disinfect the vehicle. Discuss this topic with the participants and agree a solution.

4.13.10 How do we ensure that the community is aware of the bicycle ambulance?

It will be important to ensure that all members of the community are aware of the BA. Solutions should be discussed amongst the participants. It can be helpful to conduct introductory rides during church services but also involve the schools and other community gatherings. For many, they will be seeing bicycle ambulances for the first time.

These visits present participants with the ideal time to inform the community where the ETS vehicle will be stationed. The names of the ETS riders should also be distributed to the wider community. Group discussions are recommended to capture the views of the participants. Key to sensitising the wider community is securing buy-in from traditional or community leaders. Their support is essential.

4.13.11 Safe Riding

Riding a bicycle ambulance is not the same as riding a bicycle. The rider has an additional load to pull which may make the bicycle a little less responsive than usual. It will be harder to get started due to the extra weight, and it will take much longer to cross streets and paths due to the extra length. When going downhill you will pick up speed more quickly than by riding a bicycle alone. Be sure to apply the brakes often to keep your speed under control, rear brakes should be applied before front brakes. When you turn around a curb or corner, make sure that your speed is slow so as not to make your trailer roll-over.

Night riding is potentially more dangerous. If you must ride at night make sure that you have front and rear lights. Make sure that your front, rear and side reflectors are clean so that you are visible. It is recommended that the rider should always wear a high visibility vest when transporting pregnant women. The riders are encouraged to use the torches if available.

4.13.12 Maintenance of Bicycle Ambulance Trailers

Washing the trailer takes away the important grease that is lubricating your bearings. Without the grease, your trailer would get damaged quickly which could be quite expensive to repair.

To properly wash your trailer, use a bucket of water, a sponge and some detergent. The idea is to wet your trailer to loosen up any mud then use the sponge and detergent to clean it off. While washing the wheels, check for any tread wear and tear or any sign that may indicate that it is time to change a tyre. After washing, rinse your trailer and dry it with a soft cloth. Then re-apply grease where needed.

Before using your trailer check the tyres if they have enough air pressure. A trailer with low air pressure would slow you down since it would drag you.

The trailer is fitted with a removable stretcher which needs to be washed before and after transporting a pregnant woman or sick child. This is highly recommended to maintain hygiene whenever patients are being transported.

4.13.13 Safety Tips

We can make bicycling safer for all by observing the following safety tips:

- Obey all traffic controls
- Wear your high visibility clothing every time
- Ride your bicycle near the left-hand side of any public road. Avoid using busy roads and use alternative routes were possible
- It is not encouraged to carry more than one person on your bicycle ambulance (unless it is a carer and small child)
- Be careful when checking traffic and don't swerve when looking over your shoulder
- Give pedestrians the right-of-way
- Keep your bicycle in good condition
- Night riding should be done with proper lighting
- Always ride carefully
- Remember a bicycle is a vehicle. Cyclists share a complex traffic environment with other larger forms of transportation.

4.13.14 Note to Trainers

The trainer should end the session by emphasising the need to ensure that the ETS is kept assembled at all times to be able to respond to emergencies. The trainer should also mention the importance of keeping the vehicle clean after and before using it to ensure no blood or other bodily fluids are present. This is the responsibility of the riders.

4.14 Session 14: Formulating Community Systems - Action Plans on Food banks, Saving Schemes and Construction of the BA shelter

4.14.1 Session Objectives

Participants should develop an action plan which proposes a clear timeframe in which to introduce ETS in their respective communities. The community should hold a community meeting with all

traditional leaders in attendance. ETS Riders should prepare an agenda for the meeting which should include:

Activity	Period
Construction of the ETS shelter	6 weeks
Selection of the ETS Custodian	1 week
Selection of the ETS Maintenance committee	6 weeks
Establishing/contributing to saving schemes and food banks	6 weeks

The above activities in the box can be implemented separately. In most cases it's important for the trainer to agree on the timings with the community and set a deadline which should be communicated to everyone involved.

During these meetings, the riders can encourage small group discussions to explore opportunities and challenges to achieving these activities, and an appropriate timeframe.

4.14.2 Group Discussion

The trainer should divide participants into groups of four where possible. Groups should formulate an action plan taking into account the following:

- What activities are needed once they arrive in the community with an ETS vehicle
- What method are they going to use to recruit and train additional riders
- How are they going to engage the wider community in constructing the shelter for the vehicle
- How are they going to choose the location where the vehicle will be kept
- What timeframe do they think all this will be achieved in

Each group will then present their action plan to all participants.

4.14.3 Note to Trainers

There is no hard and fast way to plan for the introduction of ETS in communities. There is flexibility to adopt different approaches within reason. However, there are some key points:

- Four -six weeks is an appropriate timeframe within which to conduct a general community meeting to introduce the ETS.
- It is important that traditional/community leaders are present at this meeting
- ETS riders should assemble and dismantle the ETS vehicle at this same meeting.
- The decision as to where to keep the vehicle should be community-led and may need to be changed if the chosen location is compromising access.
- The location should be central to ensure equal access.
- Repairs and spare parts and how to pay for these must be discussed early on.

4.15 Session 15: Review and Handover to District Health Management Team

4.15.1 Session Objectives

Participants should be able to demonstrate a general understanding of the training and make a commitment to performing their tasks to the best of their ability.

4.15.2 Review of Training

A review of the training should take place with participants pointing to at least two things they have gained as a result of the training. Participants should also be ready to declare their commitment and willingness to carry out their role as ETS riders to the best of their ability and to reflect on their statements of commitment.

4.15.3 Closing Statements

This should be carried out by the District Health Management Team and should include speeches from local leaders before officially closing the training.

4.15.4 Note to Trainers

The trainer must ensure that names, telephone numbers and community details are collected for all participants. Participants should all have collected their vehicle and any additional tools at the end of the session.

5. Annexes

5.1 Annex 1: Guidelines on How to Use a Bicycle Ambulance

1. Ensure that the stretcher is disinfected properly after every use and before you transporting the next patient.
2. ALWAYS check the bicycle ambulance before you start your journey
3. Ensure that the stretcher is locked in place properly before you start your trip.
4. The nut and bolt hinge attaching the stretcher carriage to the bicycle must be checked before each trip.
5. Ensure that every trip is recorded in the log book.
6. **Do not use** the bicycle ambulance to transport the following:
 - a. More than **ONE** patient/person (adult) at a time on the stretcher/carriage (one adult and small child is acceptable)
 - b. More than **ONE** rider/person on the bicycle at a time (nobody on the carrier)
 - c. Dead bodies of humans or animals
 - d. Maize or other food stuff
 - e. Charcoal
 - f. Boxes of tomatoes or other food stuff
 - g. Fire wood
 - h. Heavy travelling bags
7. Ensure that the bicycle ambulance is serviced regularly and is not parked broken.
8. It is the responsibility of the Communities/Zones to source funds for maintenance. Communities should be encouraged to plan for how they can fund-raise for BA maintenance.
9. Always ensure that the bicycle ambulance is parked in a secured place and is not parked in the sun or rain and left exposed to the weather.
10. It is the responsibility of the Communities, Zones, NHC's and/or PHC's to ensure that all pregnant women and sick children suspected to have severe malaria have equal access to the use of the bicycle ambulance.

No expectant mother or child suspected of having severe malaria should be denied the use of the bicycle ambulance to access a health centre.

5.2 Annex 2: Example ETS Rider Logbook

Bicycle Ambulance Logbook

Ambulance Custodian: Alumakino Nikisi Phiri

BEOC Catchment area: Mpelembe

Health Post: Reuben

5.3 Annex 3: Diagram of Bicycle Parts



5.4 Annex 4: Maintenance Record Form

Date	Type Repairs Done	Spare Part(s) Replaced	Cost
21/06/17	Service	1.Chain 2.Front tube	1. K40.00 2. K 22.50
21/08/2017	Welding on the trailer	None	1. K120.00

5.5 Annex 5: Lifting

Start the lesson by putting the BA stretcher and a bag (a backpack or small bag) on the ground in the centre of the group.

Ask 1 or 2 participants to lift the bag imagining it is a 25kg bag or rice/maize.

Next, ask 1 or 2 pairs of people to lift the stretcher imagining it has a pregnant woman lying on it.

The point of this exercise is to see how people lift heavy objects and get a general consensus from the participants what they consider to be the right way to lift heavy objects. This informs the trainer of the participants knowledge on lifting heavy objects and identify the incorrect techniques used before demonstrating the correct, safe way to lift.

The correct way to lift is by bending the knees and keeping the back (spine) straight. The object that is being lifted should also be as close to the lifters body as possible to reduce strain. The idea is to use the legs, a much stronger muscle than the back or arms, to lift the weight.

- If this is done, congratulate them and continue with the lesson as laid out explaining why it is done and how to apply it to lifting the stretcher and patients correctly.
- If this is not done then tell them their way is incorrect and proceed to show them the right way and then follow the lesson as laid out.

Demonstration of Lifting Techniques:

Facilitator demonstrates each of the lifting techniques for moving pregnant women onto the BA using some of the participants to assist in the demonstration.

Note:

There will always be family and community members present during such stressful times as an emergency. It is the responsibility of the BA rider to take control of the situation so s/he can operate quickly and safely to transport the patient. The BA rider should direct who s/he needs to assist and ensure those around do not interfere with the process of moving and transporting the patient.

Note for stretcher use:

- If the woman is conscious she will decide how to position herself, sitting up or lying down, as she will know what is most comfortable for her. **DO NOT** force her to lie a certain way on the stretcher.
- If the woman is unconscious then position her lying down.

Lifting using the BA stretcher

2 people:

- One person at each end of the stretcher
- Both people face the stretcher and each other (nobody turns around with their back to the stretcher)
- As a team there must be a “captain”, someone who gives the directions to lift, turn, walk, stop, put down etc in order to be safe and work together
- Hold stretcher using both hands, one at each corner of the stretcher

- Leave enough room when standing up not to hit the knees with the stretcher but not too far back from the stretcher or there will be extra strain on the back when lifting and may cause the person lifting to fall forward
- Lift together – the “captain” directing when to lift, for example “1, 2, 3 lift” (agree the command before lifting)
- When the stretcher is lifted both arms should be straight, no bend in the elbow. The hands and arms are purely for holding, not lifting the stretcher.
- Before putting down the stretcher take a small step back from the edge of the stretcher to allow the stretcher down freely without hitting the knees
- **ALWAYS** keep the back (spine) straight and lift and put down by bending the knees and using the legs as the main power/muscle

4 people:

- One person at each corner of the stretcher (nobody holding the middle of the stretcher)
- Everything else is the same as above with 2 people; one “captain” to direct, lift using legs, don’t bend the back, work as a team.

Note:

- It is likely that when using 4 people, some of them will not have used the stretcher before. **BEFORE** setting up and attempting to use the stretcher quickly instruct the team, who is the “captain”, how to lift using the legs and not the back, working and moving as a team etc.
- The same applies if 2 people are lifting the stretcher and only the BA rider has experience so has to call on a family member or bystander for assistance.

Lifting stretcher onto/off BA trailer

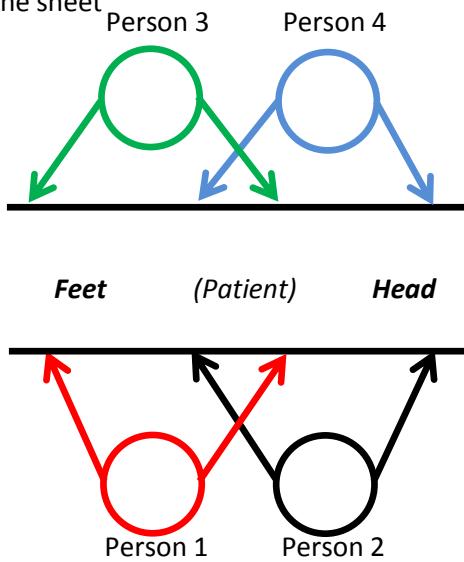
- Someone always holds the bicycle for stability
- Place the stretcher on the trailer by entering from the right hand side as you look at the BA from the rear. You are approaching the trailer on the opposite side from the hitch. This means you do not have to step over the boom (steel bar that attaches to the hitch) and become unstable.
- Work as a team, lift the stretcher onto/off the trailer together under direction of the “captain”

Lifting using blanket/sheet

(to be used if the stretcher cannot enter the building or be used)

- This method requires 4 people at all times and **cannot** be used with 2 or 3 people
- Always use a strong blanket/sheet (for demonstration use the BA canopy)
- Patient to lie flat and in the centre of the sheet
 - If patient is not already on sheet they will need to be moved onto one
 - Move the patient onto their side gently (someone should hold/support the patient)
 - Place the sheet up against the back of the patient
 - Roll the patient gently onto the sheet on their back
 - Gently manoeuvre the sheet under the patient so they are centred on it
 - Ensure the patients legs are together and arms are by their sides
- On each side of the patient there should be 2 people

- Roll the sides of the sheet (the long sides, the length of the patient's body head to toe) tightly, like rolling up a rug or mat, until they are touching the patient the whole length of their body
- *The grip for all hands is an overhand grip (knuckles facing up, palms down)*
- Of the two people closest the feet, one of each of their hands grips the rolled sheet near the feet
- Of the two people closest the head, one of each of their hands grips the rolled sheet just above the top of the patients head (this prevents the patients head from falling backwards when lifted)
- The remaining hands of those lifting will hold the rolled sheet approximately where the patients hips are
 - This holding technique requires that the remaining hands of each 2 people on each side of the patient to cross before gripping the rolled sheet. This means at the centre of each side of the rolled sheet the lifters will form an “x” with their remaining arms as they grip the sheet



- As with the other lifting techniques, work as a team under the direction of the “captain”

Lifting using hands only

(to be used if the stretcher cannot enter the building or be used and the patient is conscious and can stand but not walk safely)

Only to be used if there is not bleeding or bodily fluid discharge from the patient

- This method requires 2 people
- First person, right wrist (palm down) to be held by left hand (overhand grip, palm down)
- Second person faces the first person, face to face
- First person, using their right hand (overhand grip, palm down) grips the wrist of the right hand (palm down) of the second person
- The second person now grips the left wrist of the first person using their right hand (palm down) which is already being gripped by the first person's right hand
- A 3 handed interlocking seat is created
- The second persons left hand is placed on the first persons shoulder creating a “back” to the “seat” for the patient to brace their back against while on the seat

- Once the seat has been created the 2 lifters move behind the standing patient, still facing each other
- The lifters lower the “seat” by bending their knees and keeping their backs (spines) straight to a height that the standing patient can easily sit on the “seat” (the 3 interlocked hands)
- The patient sits on the “seat”
- The patients places both arms around the shoulders/necks of the lifters for stability
- The lifters take the weight of the patient and lift the patient using correct lifting technique
- When letting the patient down make sure to use the correct lifting technique
- As with the other lifting techniques, work as a team under direction of the “captain”

5.6 Annex 6: Bicycle Ambulance Assembly

Below is an illustrated guide on the assembly of the Bicycle Ambulance trailer.

Bicycle Ambulance components:

- Trailer
- Trailer wheels (x2)
- Hitch and clamp
- Stretcher
- Canopy frame
- Canopy

Trailer Assembly

- Turn the trailer upside down
- Insert wheels into axle brackets as shown



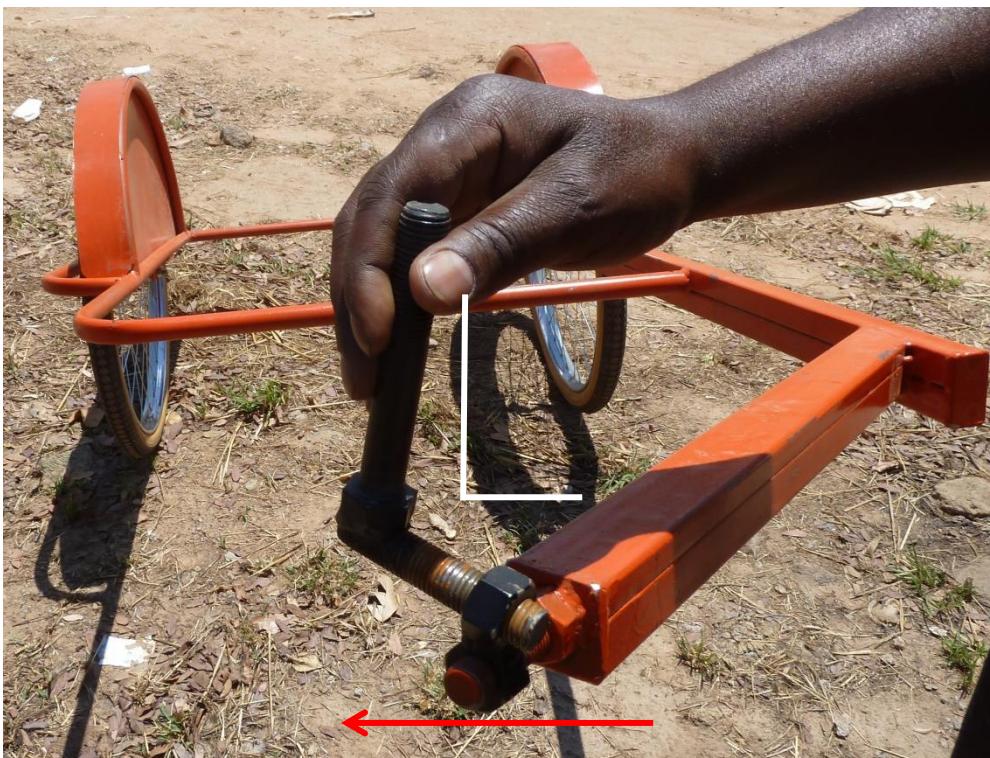
- Ensure that the washers on the wheel axle are located on the inside of the axle brackets as shown. This is to ensure a solid tight connection.



- Make sure that when tightening the nuts the bottom of the wheel (the part that touches the road) is chambered (angled) slightly outwards from the trailer. This is to ensure stability and correct weight distribution. It only needs to be a small angle outwards.
- Attach and tightly secure both wheels to the trailer.

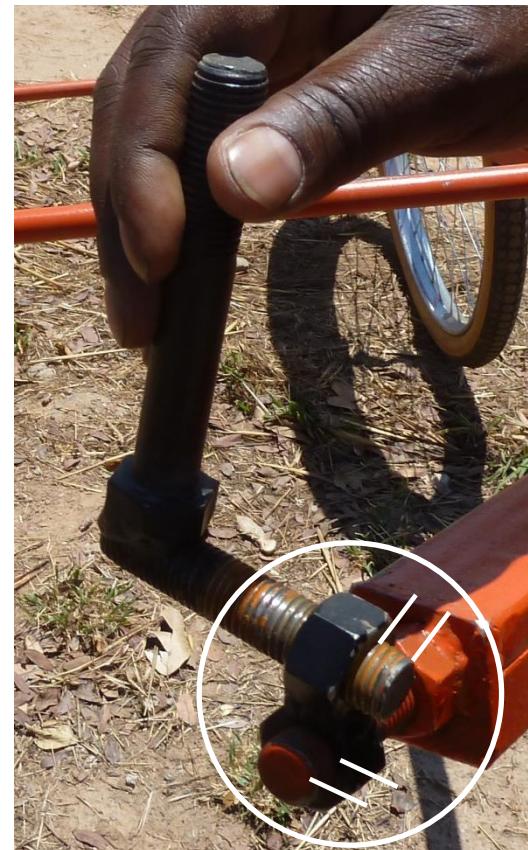


- The hitch (nut and bolt set up) on the trailer must be orientated in the correct manner as shown
- When the trailer is on its wheels, right side up, the “L” shaped welded bolts should be to the left of the boom (connecting bar) as shown in the “L” orientation.



Note:

- The distance from each nut to the end of each bolt is approximately 1 – 1.5 cm
- This is important and allows for a greater flexibility and range of movement



INCORRECT hitch orientation



Clamp Attachment

- The clamp back is positioned at the back of the seat stay (angled vertical bar) and chain stay (horizontal bar) on the left side of the bicycle as shown.
- The longer angled holder bar is located at the bottom (chain stay)
- The shorted angled holder bar is located at the top (seat stay)



- The clamp front is bolted onto the clamp back as shown. There is no specific orientation for this piece.



- Tighten the bolts securely; however do not over tighten to damage the clamp or bicycle.
- When tightening the bolts make sure to alternate so it comes together correctly. That is, tighten the top bolt with 2 or 3 turns and then turn the bottom bolt 2 or 3 times and back again to the top bolt and so on.
- The clamp front and back pieces do no need to touch in order for it to be secure.



Trailer Attachment

- Move the already assembled trailer and hitch behind the bicycle
- Insert the long bolt into the barrel from the bottom as shown



- Screw on the self-locking nut as shown



- Tighten the self-locking nut with a wrench or spanner.
- It should be tightened to the point where there is still play for the long bolt to move within the barrel.
- **Do not** over-tighten or it will restrict trailer movement and cause damage.



- Trailer attached to the bicycle via the hitch and clamp assembly

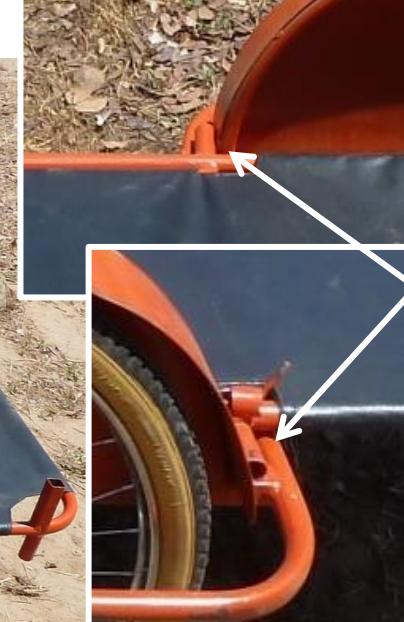


- Demonstrate the full range of motion of the trailer when it is attached as shown



Stretcher and canopy Assembly

- Place the stretcher onto the trailer as shown. The locator bars hold the stretcher in place as shown.
- Note the stretcher orientation: The head of the patient and the adjustable headrest is positioned closest the rider. The patients feet are at the bottom of the stretcher furthest away from the rider



Locator bars to hold stretcher in place while moving



Headrest raised
using chain and pin
to secure

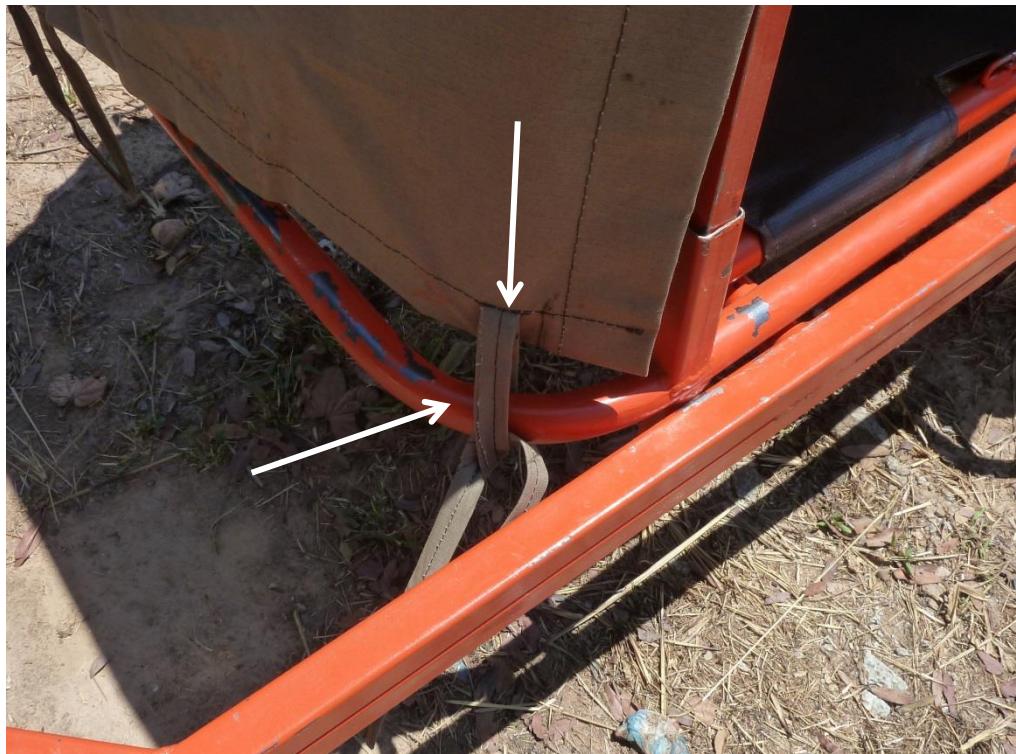
- Attach the canopy frame by inserting the frame legs into the box steel holders as shown
- Ensure correct frame orientation;
the higher part of the frame is located at the top of the stretcher when the patients head is
the lower part of the frame is located at the bottom of the stretcher where the patient's feet are



- Place the canopy over the frame as shown.
- Ensure the orientation of the canopy is correct. There is a short and long end panel to the canopy to follow the shape of the frame. The mesh window on the end panel is located at the feet end of the stretcher. There is no mesh window at the end where the patients head is located.



- Tie the canopy to the stretcher using the ties on the canopy as shown



- **DO NOT** tie the canopy to the trailer frame otherwise the canopy will have to be untied every time the stretcher needs to be moved off of the trailer wasting time.



Bicycle Ambulance fully assembled

