

## **Zambulance Report Summary**

This report is compiled of a study of 24 zambulances (5 from Northern Province, 17 from Eastern Province, and 2 from Southern Province). The zambulances studied were placed by the following NGOs: CRS, Malaria Consortium, Care Int., ZPCT, and US Aid. The zambulances placed by Care Int. and MC were most consistently used and appeared to have the best structure of implementation<sup>1</sup>. The elements of implementation that seemed to result in their success were thorough research of best site locations, extensive training/orientation, detailed organizational structure, and no limitations on usage.

### **Usage**

Of the 24 zambulances, one was never assembled properly (essential parts were missing when it was delivered by the NGO), one was stolen, and one was not needed (a truck was available for the Health Center's use). The 21 remaining zambulances were used an average of 22 times/yr. Each zambulance was estimated to provide treatment for an average of 15 individuals/yr that likely would not have received treatment otherwise. In addition, on average over 5 people's lives were saved each year by use of each zambulance. Most often, the zambulance was used for HIV/chronically ill patients, followed by pregnancies and Malaria cases.

### **Distance**

The average distance traveled one way by the zambulances studied was approximately 9 km. The farthest average distance travelled one-way was 20km and the shortest was 2km. The sites that used the zambulances most frequently typically traveled an average of 10-15km/one-way trip. Based on the data, it seems that it is reasonable to expect the zambulance to perform well on average distances up to at least 20km and to expect ideal performance and usefulness at around 10-15km/one-way trip.

### **Logbooks**

Of the zambulances studied, 14 kept logbooks of use. Logbooks proved to be helpful for keeping accurate records but did not seem to encourage higher usage. The most accurate records seemed to be available from Malaria Consortium placed zambulances, which placed logbooks with both the RHC and CHW. This also encouraged involvement and cooperation between the RHC and CHW.

### **Location**

Of the zambulances studied, 9 were posted in the community, 9 were posted at the RHC, and 5 were posted with Home Based Care programs (at the office or director's home). The main challenge with placing them in the community was finding a good storage location. Often the zambulance is kept at the Headman's home or the CHW's home,

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<sup>1</sup> Only one US Aid site was studied, but it also had a strong structure of implementation.

which proves sufficient, provided neither the Headman or CHW misuses it and has sufficient space to store it. In one case, the community school proved a good alternative.

The main problem with placing them at the RHC was that people would have to come to the RHC to pick up the zambulance, return to pick up the patient in the community, and then return to the RHC.

The main problem with HBC placed zambulances is that they were only used in HBC medical situations. If someone was not receiving treatment from HBC, they often did not have access to the zambulance.

Several individuals interviewed suggested that it would be ideal if there were a zambulance stationed in each zone surrounding the RHC to be made available for use by those communities within each zone and another zambulance was kept at the RHC. This would allow for the broadest and most efficient zambulance access in emergency situations. If only two zambulances were to be placed, one in the community and one at the RHC seemed effective because it created increased partnership between the community and RHC and made the zambulances available for a larger number of people in the surrounding areas (and they can go pick the closer of the 2 zambulances). If only one zambulance is placed, HBC programs have the most complete benefit, but it can be highly successful in a community or RHC as well.

### **Organizational structure**

Perhaps the greatest determinant of a successful placement was that of a clear organizational structure. Locations that used the zambulance most frequently were mostly those where it was clear who was responsible for the zambulance and who could drive it. If the individual(s) in charge of the zambulance did not fully understand its purpose or their responsibilities, then it was highly likely that the zambulance would not be used to its full potential. For this reason, a clear orientation that provides training and instruction for individuals responsible for the zambulance is highly important. Whether it is the HBC programs, Neighborhood Health Committee, Community Health Worker, specific directors/employees of the RHC, or other individuals that are placed in charge, they need to have a clear understanding of how to use the zambulance and the importance of their role and responsibilities. For example, if it is their responsibility to do mechanical repairs on the zambulance (and bicycle) they need the proper tools and training in how to use them. In addition to training for those in charge, it is also helpful to communicate to the community how they can benefit from the zambulance.

### **Performance**

The zambulances studied were used on a wide variety of terrain. For each site, it was determined whether the majority of the terrain was best described as narrow roads (bush paths), rocky/hilly, dirt, or gravel/sand. Once a main descriptor was chosen, the zambulance's performance was rated on a scale of 1-5, 1=poor, 5=excellent. Based on this rating system, the zambulance performed best on dirt roads with a score of 4 and second on rocky/hilly terrain with a score of 3.4. It performed below average (3) on narrow roads and gravel/sand with scores of 2.6

and 2 respectively. The zambulance was often said to be too wide for many bush paths and thus difficult to navigate. On gravel/sand roads with any hills the zambulance would often get stuck and need to be pushed from behind.

### **Suggested improvements**

#### *Spares*

The most common problem was flat tires and the spare part most often needed was tire tubes. Because the tires and tire tubes are fairly unique to the zambulance, it is difficult to find replacements in rural areas. If each zambulance were placed with a tire tube repair kit and an additional tire tube, it would help keep the zambulance from sitting around unused with flats. Also, many rural areas did not have a proper pump or pump needle to inflate the zambulance tires. The spare parts kit would also likely benefit from a pump needle or pump that works for the zambulance. On a lesser scale, canopy, hitch, and nuts and bolts replacements were occasionally needed. Since the canopy design has been improved (most of the zambulances studied had box canopies) and is not vital to the use of the zambulance, a replacement seems unnecessary for a spare parts kit. If anything, a square of canopy fabric could be included for patch jobs. However, since the nuts and bolts and hitch are important for the proper use of the zambulance and hard to replace, it might be worthwhile to include a spare hitch and a few extra nuts and bolts for replacements.

#### *Plan for spares*

About half of the zambulance sites interviewed needed spares but could not find them, could not afford them, or both. Zambulances placed in communities especially had a difficult time finding spares and/or getting money to replace them. It might be beneficial for those in charge of zambulances to be given information detailing where spares can be purchased (and prices?) and contact information. At the very least, it would be helpful if the person in charge of the zambulance were given an avenue to purchase spares, whether through the NGO, Zambikes, or a distributor. As for money, it seemed that zambulances in rural communities had the hardest time raising the money and it is important that the rural health center have stake in the zambulance as well if they are going to help repurchase spares. It would be good to have a plan set up for how a site is going to get money for spares (NGO sets limited funds aside for future spares, community buy in, charge for zambulance use, RHC pays for it, etc).

#### *Design improvements/suggestions*

There were three complaints that seemed to reoccur throughout the study. The first was the weight of the zambulance. Some sites requested that it be lighter so they could handle the more difficult hilly terrain. The second was the width. Some sites found the zambulance to be too wide for the narrow bush paths. If it were narrower, it could go on more paths. The third problem was with the canopy attachment. Most sites would remove the canopy for storage purposes but would reattach it before use. In time sensitive situations, it could take too long to attach every bolt for the canopy. It could be helpful to create a simple attachment and locking system for the canopy that doesn't require the unscrewing and re-screwing.