



Piloting a Motorking Ambulance Service in 3 Districts of Northern Ghana

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Introduction

- Delivery of integrated primary health care interventions in Ghana is undermined by weak referral systems that do not adequately identify and respond to complications related to pregnancy, childbirth and infant care.

Mortality: UER, Ghana

Infant mortality	46 per 1000
<5 mortality	78 per 1000
Maternal mortality	131 per 100,000



Mortality: UER, Ghana

- Children <5 deaths
 - ▣ Malaria and neonatal mortality are leading causes of death

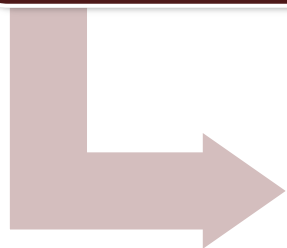
- Female deaths
 - ▣ Maternal mortality is second leading cause of female death

- Many of these deaths are preventable
 - ▣ Main causes: hemorrhage, sepsis, unsafe abortion, prolonged/obstructed labor, high risk pregnancy, etc.

Contributing factors: Delays

Seeking
Care

- **Cultural norms**
- **Prohibitive cost of fuel**



Reaching
Care

- **Infrastructure**
 - Poor road conditions and long distances to facilities
 - Absence of emergency transport and communication system
 - Lack of affordable and appropriate vehicles



Receiving
Care

- **Absence of strong referral network**
- **Lack of adequate resources**



Emergency Referral Pilot

Goal

- Strengthen emergency referral system in order to reduce maternal and perinatal mortality

Hypothesis

- Delay in **reaching** care can be reduced by implementation of a:
 - ▣ Decentralized emergency transport system and
 - ▣ Emergency-only communication plan linking:



to hasten transport of emergency cases



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Sustainable Emergency Referral Care (SERC) Initiative



Launch date: July 2013 (followed a 6 month pilot)

Location: Upper East Region, Ghana

3 districts:

- Bongo District
- Builsa North District
- Builsa South District

Population: ~184,004

Funded by: Comic Relief



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The SERC Hypothesis

Context-specific, community- and sub-district level interventions designed to strengthen emergency referral systems will improve access to emergency health care in rural, impoverished communities in Ghana



UER Context:

- Scarcity of vehicles
- Poor road networks
- Geographic barriers
- Terrain: Rocky and mud-covered roads
- Main modes of transport: walking, bicycles, motorcycles and donkey carts
- NAS policy did not take into consideration entirety of country context in design of a NAS



The Intervention

Emergency transportation system:

- Strategically deployed 24 Motorkings to serve as ambulances
- Ambulances stationed at:
 - ❖ 9 sub-district level health centres
 - ❖ 12 community level health facilities
 - ❖ 3 communities (with no health facility in the community)
- Determined ambulance catchment areas using GIS data based on geography and proximity to health facility



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The Intervention

Emergency communication system:

- Developed an emergency communication system using dual SIM mobile phones to facilitate rapid communication among: Health workers, Volunteer drivers, and Community health volunteers

Fee structure:

- Pregnant women and children under 5 transported free
- All other cases charged a pre-determined fee by Districts based on distance (ranging from \$2.50- \$5.00)



The Motorking

- 3-wheeled motorcycle (*“tricycle”*)
- Manufactured in China
- Procured from LK International (Ghana)
- Vehicles modified to serve as ambulances (with support from LK International and local welders)
- Comprehensive insurance acquired



The Motorking “ambulance”

Modifications made:

- Welded frame for tarpaulin
- Hook for IV drip
- Mattress with belt
- Extended rearview mirrors
- Seat for health worker

Equipped with:

- First Aid kit
- Spare tire and jack
- Protective gear (helmet, rain boots, rain coat)
- Spare parts kept in stock at RHD



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Drivers, Trainings, & Vehicle Maintenance

- 2 community-selected volunteer drivers per ambulance
 - ❖ Volunteers must reside near ambulance station and be literate (for documentation needs)
 - ❖ Assisted by GHS and DVLA to obtain licenses
- Drivers trained on:
 - ❖ Safely operating the Motorking
 - ❖ Safely transferring patient into the vehicle
 - ❖ Basic First Aid
 - ❖ Communication protocols and record keeping
- Comprehensive insurance acquired
- Vehicles routinely serviced by RHD mechanics



Driver Training

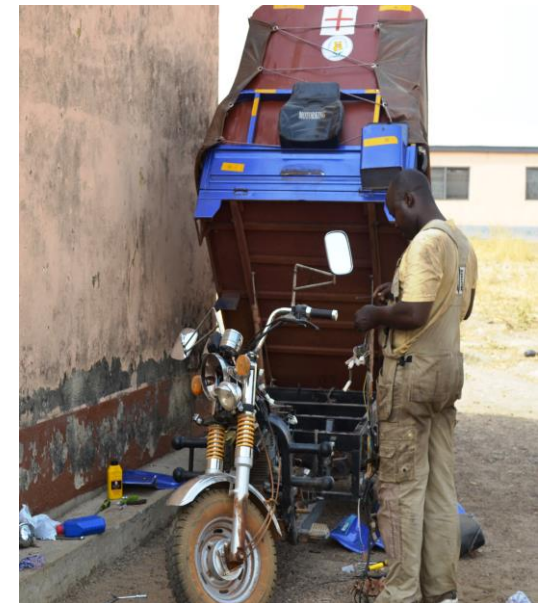
(by St John Ambulance Service)



Key Findings

Vehicle usage and suitability

- Over 800 emergency cases transported since August 2013
- Well-suited for rough terrain and narrow passages
- Issues with balance during rainy season due to worsened road conditions
- Breakdowns have been minimal and primarily related to driver inexperience
- Drivers with prior experience with motorbikes are able to make quick repairs to the Motorkings themselves without having to call a mechanic



Community acceptance

- Initial process evaluation suggests that SERC has been well-received by the community, despite some community members' preference for a 4-wheeled vehicle



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Key Findings

Health worker (HW) attitudes

- According to a recent survey of HWs involved with SERC, most HWs believe the initiative is having a positive impact on the communities they serve
- Majority of HWs consider the Motorking safe for emergency transport
- More than half of HWs surveyed expressed interest in receiving driver training for instances in which volunteers are unavailable
- Some HWs raised concerns over patient and HW comfort during transport
- Poor road networks was the most frequently cited challenge to emergency referral (95%), followed by lack of driver motivation (59%), and delays in seeking care due to social norms (40%)

Experiences with volunteer drivers

- Qualitative appraisal underway to assess driver reactions to SERC
- Turnover is mostly related to young, educated volunteers moving on in pursuit of greater economic opportunities



Referral in action: Labor case



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Lessons Learned

1. Selection criteria for volunteer drivers need to be refined to minimize turnover and optimize efficiency
2. Community involvement in the planning process is essential
3. Communities need support in lobbying for improved infrastructure
4. Routine maintenance and prompt repairs are crucial for preventing breakdowns
5. Manufacturers should be consulted about ways to enhance vehicle comfort
 - ❖ Smoothing the suspension could lessen the impact of rough terrain on the vehicle and its passengers)



Lessons Learned

1. Manufactures need to be consulted about extending the mirrors on the Motorking (we had initially overlooked this issue, so we had to go back to extend them).
1. Reflectors should be placed on the mirrors and other parts of the Motorking so that people notice that the Motorking is larger than the usual motorbike (it has only one light, so it can be mistaken for a 2-wheel motorcycle, which can lead to crashes if another driver on the road underestimates the size of the Motorking)

Implications for Ghana and beyond

- Motorkings are an effective means of emergency transport in impoverished, remote areas with infrastructural challenges (Last week CRS expressed interest to support scale-up in UER)
- Strong partnerships with vehicle manufacturers, local authorities, community members, and the health system are essential for program success



Transportation Challenges and Referral



Transporting Referral



Emergency Transportation Challenges



Transport for emergency maternal referral

Innovative ways of providing maternal referral services in remote and deprived Communities



The Tricar Vrs Motorking



Tricar



Motorking I



Motorking II



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The News

Zero Maternal Mortality At Bongo District -
SpyGhana.com

<http://www.spyghana.com/bongo-district-records-zero-maternal-mortality/#.UytHGZp0vZQ.gmail>

[Health News](#) | Wed, Mar 19th, 2014

Zero Maternal Mortality At Bongo District

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Thank you

