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Reducing Road Traffic Accidents and Mortalities in Mwanza, Tanzania: Proposal

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Introduction

- Motor vehicle growth in low- and middle-income countries is taking place at an unparalleled rate
- In developing countries road traffic accidents (RTAs) have an average of 20.8/100,000 deaths per year
- By 2020, RTAs are projected to be accountable for 2.30 million deaths globally
- Road traffic disability-adjusted life years lost will jump from 9th to the 3rd leading cause of disability-adjusted life years lost

(WHO, 2001; Tong, Merry, & Coifman, 2005)

Issue at Hand

- Tanzania has witnessed a 5-fold increase in recorded traffic-related fatalities (Tong, Merry, & Coifman, 2005)

- Injuries are the 2nd cause of death, with RTAs being the most prevalent (Ngallaba, Makerere, Kapesa, & Gilyoma, 2014)

- Haddon Matrix is one way to understand the complexity of why RTAs occur
  - Identifies risk factors before, during, and after crashes, relative to the person, vehicle, and environment (WHO, 2007)

HADDON MATRIX		Factors		
Phase		**Human**	**Vehicles & Equipment**	**Environment**
Pre-crash	Crash prevention	- Reckless driving - Drugs/alcohol - Fatigue - Failure to adhere to laws/regulations - Exceed number of passengers in a vehicle - Low levels of ownership	- Poor vehicle conditions - Out of order vehicles that continue to carry passengers - 3-wheeled taxis are poorly maintained & offer little protection to passengers	- Poor road conditions - Lack of road signs/traffic lights - Poor enforcement of traffic safety regulations - Traffic density & composition - Weather
Crash	Injury prevention during the crash	- Musculoskeletal & head - Open wounds & fractures	- Majority of crashes are with motorcycles, motor vehicles, pedestrians, & bicycles	- Majority of crashes occur during the day
Post-crash	Life-sustaining	- Mortality rate 17.5% - Of injuries & deaths, majority were passengers, then pedestrians, drivers, & cyclists		- Mortalities occur at health facilities - Inadequacy of health infrastructure & poor access to care

(Chalya et al., 2010; Chalya et al., 2012; Ngallaba et al., 2014; OSAC, 2014)

Purpose

The purpose of this proposal that will be carried out in Mwanza, Tanzania, is to:

1. Reduce road traffic accidents
2. Reduce injury, morbidity, and mortality due to road traffic accidents
3. Increase awareness regarding road safety

Identification of High Risk Areas for RTAs

- Accurate and comprehensive data related to RTAs is imperative for road safety management (Chiduo & Minja, 2001)

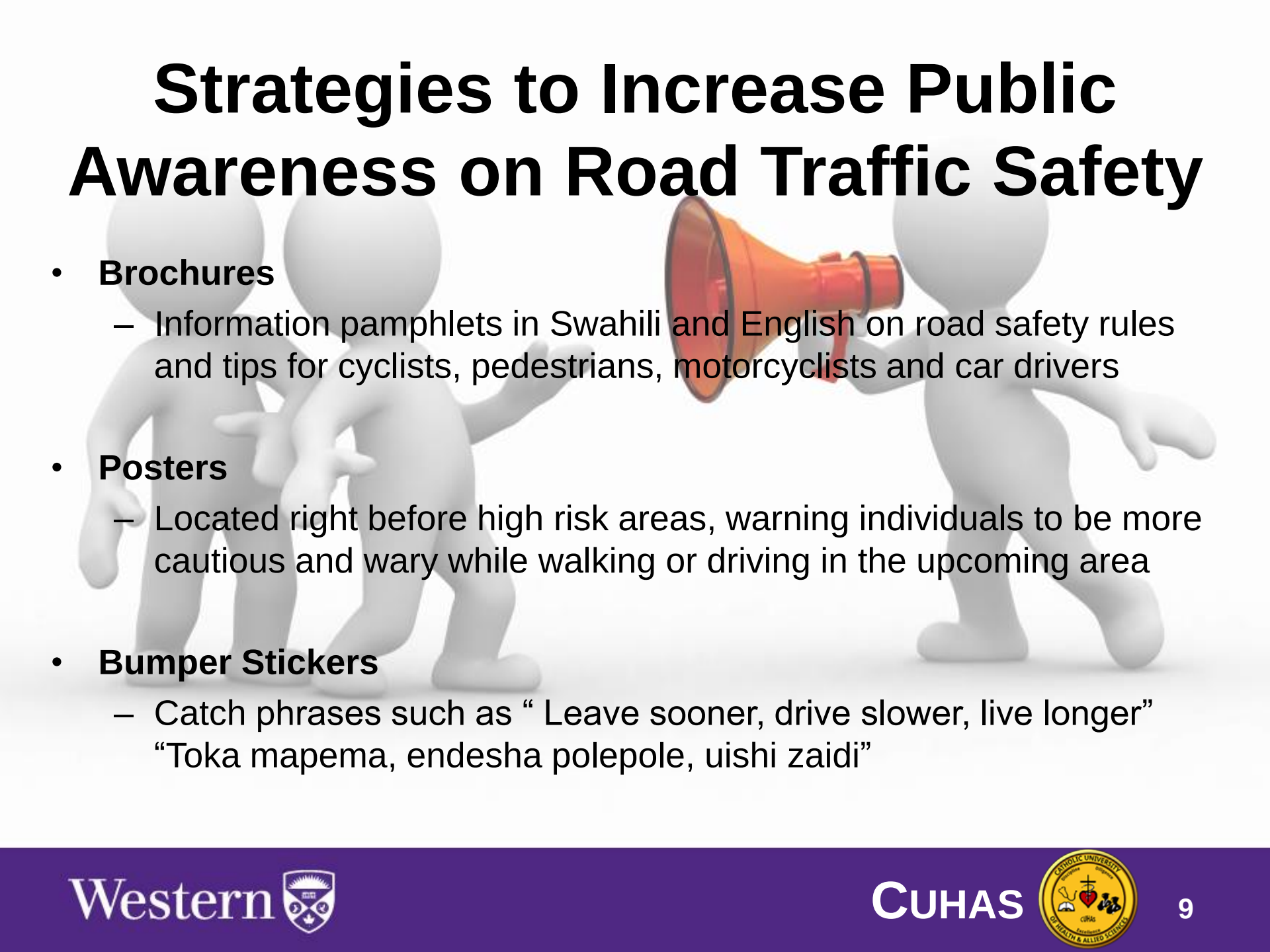
- 1st step in reducing RTAs in Mwanza is to identify high risk areas
  - High risk areas are heavy traffic areas with frequent motor vehicle (i.e., cars, piki pikis & dala dalas) and pedestrian accidents

- High risk areas will be identified using:
  - Police traffic and accident reports
  - Bugando hospital medical records

- A map of Mwanza City will be colour coded and marked to identify high risk areas

Phase 1: Education

Strategies to Increase Public Awareness on Road Traffic Safety



- **Brochures**
  - Information pamphlets in Swahili and English on road safety rules and tips for cyclists, pedestrians, motorcyclists and car drivers
- **Posters**
  - Located right before high risk areas, warning individuals to be more cautious and wary while walking or driving in the upcoming area
- **Bumper Stickers**
  - Catch phrases such as " Leave sooner, drive slower, live longer" "Toka mapema, endesha polepole, uishi zaidi"

Strategies to Increase Public Awareness on Road Traffic Safety

- **Radio advertisements**
  - Brief radio blurbs that inform the public about increased RTAs and the need to implement road safety awareness in everyday living

- **Newspaper advertisements**
  - Weekly newspaper advertisements using cartoons and animations to spread road safety messages to the public through lake zone newspapers, such as Mtanzania.

Strategies to Increase Public Awareness on Road Traffic Safety

- **Dancing groups**
  - Will be carried out in public spaces/events to attract audiences and provide information and tips on road traffic safety to all road users
  - This was successful during cholera outbreak

- **Seminars and Workshops**
  - Educational seminars and workshops for local community members and leaders alike, describing road traffic safety management and tips for local community

Strategies to Increase Public Awareness on Road Traffic Safety

- The combination of educational campaigns will reach individuals of all ages, sexes, educational levels, economic statuses, and ethnic backgrounds

- All education, intervention and training strategies must afford equal opportunity for all individuals
  - Individuals with disabilities, such as the visually impaired or physically disabled must be fully considered

Phase 2: Training

Handling of Casualties at the Site of RTAs

- Provide training programs in:
  - First aid
  - Emergency, trauma
  - Transport
  - Roadside care
  - Tow truck operation
  - Implementation of a trained mobile team with ambulance drivers

(Chiduo & Minja, 2001, SUMATRA, 2007)

First Aid and Referral System

- Communication services between police, ambulance drivers, and hospitals via telephone or radio (i.e., joint number 123 for all emergency calls)
- Health facility special ambulance team, triage system, and colour coordination
- Upgrade existing hospitals that include more doctors and nurses, medication, and equipment
- Provide medical/trauma and first aid programs
- Revise regulations on the mandatory PF 3 form

(Chiduo & Minja, 2001; SUMATRA, 2007)

Phase 3: Reducing RTA Rates in Mwanza, Tanzania

GPS Pilot Study: Intervention

- Introduce the use of smart phones with Global Positioning Systems (GPS) into dala dalas and taxis in Mwanza, Tanzania
- GPS have been successfully used to track road traffic conditions and accidents in high risk areas in countries including Finland (Tormanen, 2009) and the United States (Tong, Merry, & Coifman, 2005)
- This study will incorporate Mwanza specific warning systems into the smart phone GPS for dala dalas and taxis

GPS Pilot Study: Intervention

- The GPS will provide warnings to the driver when approaching:
  - High risk areas
  - Densely populated areas
  - Crosswalks for school children
  - Sharp turns
  - Rough roads

- The GPS warning is predicted to increase driver alertness and awareness when approaching high risk areas

GPS Pilot Study: Intervention

- Smart phone GPS will additionally:
  - Track bus routes
  - Track stolen vehicles
  - Track distance and time traveled
  - Track vehicle speeds
  - Provide real time traffic updates
  - Provide re-routes when needed

- Help drivers keep track of their vehicles (e.g., aware of where their vehicle is parked)

Summary

- Interventions must involve a collaboration of different professionals

- We will implement a multi-disciplinary approach to help resolve the high instances of motor vehicle accidents and mortalities in Mwanza, Tanzania

Summary

- We intend to reduce RTAs, injuries, morbidities, and mortalities, and increase road safety awareness through:
  - Education services through various advertising strategies
  - Training services to medical personnel, healthcare professionals, and local citizens
  - GPS intervention to implement smart phones with GPS to dala dalas and taxi drivers

Collaborators

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- **Motorcycle Driver's Association (MDA)**
- **Tanzania Local Police**

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