

Technical Report on a Road-Traffic Injury Study in a Sub-Saharan African Country

December 8, 2009

Amend Research History and Methods

Scientific evaluation and research are central to Amend’s work in Africa. This is for two reasons:

First, we conduct *process evaluations* of our work. Process evaluations help us answer questions about our work’s efficacy. Via surveys and other data collection methods we ask questions like “Are children remembering and using the road safety lessons that we teach them?” and “Has our work with the media resulted in increased and better coverage of road safety issues?” Every year, we conduct many process evaluations; the results tell us what does and doesn’t work, and help us make our programs better.

Second, we conduct *impact evaluations* of our work. Impact evaluations are multi-year efforts, and are considerably more involved than process evaluations. With impact evaluations, we seek to measure the rate and nature of road traffic injuries, and our work’s effect on reducing those injuries. It is the results of Amend’s most recent impact evaluation that this document will discuss.

What is Known About Road Traffic Injuries in Africa?

There is a lot of testimonial evidence about road traffic injuries in Africa – nearly everyone you speak with has either been in a crash or had a loved one affected by the problem. World Health Organization figures show that Africa has the world’s highest rates of road traffic injury, at 32.2 deaths per 100,000 population, yet it is generally agreed that the official statistics that inform this already-high rate are, in fact, under estimates. Most statistics that are available come from police reports, hospital records, and mortuary logs. However, it is not known how many individuals file reports or seek medical attention – certainly, fewer do so than in developed countries. Therefore, door-to-door injury surveys paint the most complete picture about the problem, however this type of research is technically demanding and labor intensive.

In West Africa one study, published in 1999 (Mock et al), stands out as a prominent example of such a population-based study. This study looked at injuries of all kinds in both urban and rural settings. It found that injuries in general were a tremendous public health problem in Ghana, and that in the urban setting, transportation-related injuries were the most common injury cause and had the greatest impact on days missed from daily activities.



Children trying to cross the road in Ghana, West Africa



An Amend research assistant in the field

Study Methodology

For our study Amend used a cluster sampling methodology. In August and September of 2009, teams of specially hired and trained research assistants were sent to 30 randomly selected GPS points within two neighborhoods in greater Accra, Ghana. They went door-to-door and asked 11,701 individuals about their experiences with road traffic injuries. Detailed data – such as the time of day, the specific circumstances of the incident, any medical attention required, and days lost from normal activity – was collected on any individual who had a transportation-related injury. The data was then analyzed to identify common crash scenarios, quantify the number of individuals affected each year, look for predictors of a worse outcome, and find any age-specific trends.

Results

Of the 11,701 individuals interviewed, 350 had sustained a road traffic-related injury in the past year. In total, there were about 23 injuries for every 1,000 person-years. In children aged 5-14, there were 34 injuries for every 1,000 person-year, or over 3 out of every hundred children in the past year. More than a third of all injuries were at sunset, and about a fifth involved bicycles. Children that had either an injury caused by a mini-bus taxi, or a broken bone were likely to miss more than 30 days from school. Contrary to popular belief, there were very few children involved in traffic-related injuries at night.

Next Steps

Now that yearly rates have been calculated and specific details gathered about road traffic injuries in the two Accra districts, the study will be repeated on an annual basis to see how the rate evolves. A tailored child-focused road safety intervention program – Amend's Be Seen, Be Safe – will be implemented in one of the districts. Subsequent phases of the study will then measure the effectiveness of the prevention program by comparing data from the intervention and non-intervention districts. The prevention program will be continuously refined with the feedback from the annual study.

About Amend

Amend was founded in 2005 to address the neglected epidemic of child road-traffic injury in Africa. Amend's mission is to prevent injuries to children before they happen. Amend's flagship road safety program, Be Seen, Be Safe, includes initiatives ranging from classroom-based road-safety lessons for primary school children, to lobbying the media for more and better coverage of road-traffic injury, to scientific research into the scope and nature of the problem of road-traffic injury, and more. Amend has its headquarters in New York City, and country offices in Ghana and Tanzania. More detailed information about Amend's work can be found online at www.amend.org.

Appendix - Raw Study Data

Table 1. RTI demographics

| | | Study Location | | Total |
|---------------|------------------------|----------------|-----------|-----------|
| | | Nima | Ashaiman | |
| Timing of RTI | Within last 12 months | 162 | 188 | 350 |
| | Greater than 12 months | 158 | 118 | 276 |
| Total | | 320 | 306 | 626 |
| Age±SD | | 27.1±18.7 | 24.9±15.1 | 26.2±17.1 |

| | | | |
|----------------------------|-----------|-----------|-----------|
| Disability Days±SD | 50.0±92.5 | | 49.6±97.8 |
| Male sex | 57.1% | 62.9% | 59.7% |
| Average | 34.7±16.0 | 41.6±13.4 | 38.1±15.0 |
| Households with no answer* | 12.1±10.2 | 20.1±11.5 | 16.2±11.5 |
| Households that refused* | 2.0±1.8 | 2.2±1.5 | 2.1±1.7 |

RTI: Road traffic injury

SD: Standard deviation

*Per cluster

Table 2. Study district comparison

| | | Study Location | | Total |
|----------|-----------------------------|----------------|----------|-------|
| | | Nima | Ashaiman | |
| RTI type | Hit by mini-bus | 29 | 26 | 55 |
| | Hit by car | 61 | 43 | 104 |
| | Hit by taxi | 37 | 22 | 59 |
| | Hit by motorcycle | 57 | 19 | 76 |
| | Hit by bicycle | 41 | 49 | 90 |
| | Hit by other | 1 | 1 | 2 |
| | Injured while on mini-bus | 34 | 52 | 86 |
| | Injured while riding a car | 35 | 45 | 80 |
| | Injured while riding a taxi | 3 | 7 | 10 |
| | Motorcycle driver injury | 37 | 27 | 64 |
| | Bicycle driver injury | 25 | 41 | 66 |

| | | | |
|-------------|-----|-----|-----|
| Total | 361 | 332 | 693 |
| Injury Type | | | |
| Cut | 112 | 142 | 254 |
| Bruise | 116 | 86 | 202 |
| Fracture | 68 | 50 | 118 |
| Amputation | 3 | | 3 |
| Burn | 4 | 2 | 6 |
| Minor | 42 | 46 | 88 |
| Total | 361 | 332 | 693 |

Table 3. RTI prevalence, incidence and disability days by age groups

| | Ages | 0-4 | 5-14 | 15-44 | >45 | Total |
|------------------------|------------------------|-------|-------|-------|-------|--------|
| When was the injury? | Within last 12 months | 21 | 151 | 170 | 44 | 386 |
| | Greater than 12 months | 1 | 53 | 175 | 78 | 307 |
| Total | | 22 | 204 | 345 | 122 | 693 |
| | | 1,647 | 3,481 | 5,226 | 1,344 | 11,701 |
| Incidence [†] | | 12 | 43 | 32 | 32 | 33 |
| Adjusted ^{†*} | | 12 | 34 | 21 | 16 | 23 |
| Disability days | | | | | | |

#Denominator represents total number surveyed for each age group

†Expressed in 1,000 person years

*Only included those within the last year that missed at least 1 day of normal activity.

Table 4. Child (1-14) vs. Adult (>14) crash characteristics

| | Child | Adult | Total | |
|--------------------|---------|-------|-------|-----|
| Injuries sustained | Head | 22 | 52 | 74 |
| | Face | 13 | 30 | 43 |
| | Neck | 3 | 13 | 16 |
| | Chest | 1 | 22 | 23 |
| | Abdomen | 3 | 13 | 16 |
| | Back | 7 | 27 | 34 |
| | Arms | 30 | 71 | 101 |
| | Legs | 128 | 181 | 309 |

| | | | | |
|-------|-------------------|-----|-----|-----|
| | General body pain | 12 | 31 | 43 |
| | Other | 7 | 27 | 34 |
| Total | | 226 | 467 | 693 |

| | | | | |
|------------|-----------------------------------|-----|-----|-----|
| Crash type | Hit by mini-bus | 16 | 39 | 55 |
| | Hit by car | 33 | 71 | 104 |
| | Hit by taxi | 26 | 33 | 59 |
| | Hit by motorcycle | 40 | 36 | 76 |
| | Hit by bicycle | 61 | 29 | 90 |
| | Hit by other | 1 | 1 | 2 |
| | Injured while riding a mini-bus | 10 | 76 | 86 |
| | Injured while riding in a car | 10 | 70 | 80 |
| | Injured while riding a taxi | | 10 | 10 |
| | Injured while riding a motorcycle | 3 | 61 | 64 |
| | Injured while riding a bicycle | 26 | 40 | 66 |
| | Injured while riding other | | 1 | 1 |
| Total | | 226 | 467 | 693 |

| | | | |
|---------------------|----|----|----|
| Playing | 51 | 9 | 60 |
| Walking to school | 18 | 10 | 28 |
| Walking from school | 28 | 14 | 42 |
| Walking to work | 2 | 27 | 29 |

| | | | | |
|-------|-----------------------------------|-----|-----|-----|
| | Walking from work | 2 | 25 | 27 |
| | Walking elsewhere | 85 | 103 | 188 |
| | Riding to school | 1 | 3 | 4 |
| | Riding from school | 1 | 10 | 11 |
| | Riding to work | 7 | 57 | 64 |
| | Riding from work | | 54 | 54 |
| | Riding-other | 25 | 128 | 153 |
| | Working as a driver | | 8 | 8 |
| | Working as a seller | 1 | 6 | 7 |
| | Going to or from place of worship | 5 | 13 | 18 |
| Total | | 226 | 467 | 693 |

| | | | | |
|-------------------|---------|-----|-----|-----|
| What time of day? | Morning | 52 | 107 | 159 |
| | Daytime | 84 | 173 | 257 |
| | Sunset | 81 | 131 | 212 |
| | Night | 9 | 56 | 65 |
| Total | | 226 | 467 | 693 |

| | | | | |
|--------------|-------------------|-----|-----|-----|
| Type of road | Highway | 100 | 354 | 454 |
| | Paved non-highway | 28 | 22 | 50 |
| | Non-paved road | 22 | 11 | 33 |
| | Small side street | 65 | 75 | 140 |
| | Parking lot | 1 | 2 | 3 |
| | Does not recall | | 2 | 2 |
| | Playground | 10 | 1 | 11 |
| Total | | 226 | 467 | 693 |

Table 5. RTI characteristics compared to severity

| Injuries sustained | Minor* | Major | Total |
|-----------------------------------|------------|------------|------------|
| Head | 52 | 22 | 74 |
| Face | 31 | 12 | 43 |
| Neck | 8 | 8 | 16 |
| Chest | 15 | 8 | 23 |
| Abdomen | 9 | 7 | 16 |
| Back | 22 | 12 | 34 |
| Arms | 70 | 31 | 101 |
| Legs | 212 | 97 | 309 |
| General body pain | 41 | 2 | 43 |
| Other | 33 | 1 | 34 |
| Total | 493 | 200 | 693 |
| Hit by car | 61 | 43 | 104 |
| Hit by taxi | 42 | 17 | 59 |
| Hit by motorcycle | 61 | 15 | 76 |
| Hit by bicycle | 87 | 3 | 90 |
| Hit by other | 2 | | 2 |
| Injured while riding a mini-bus | 51 | 35 | 86 |
| Injured while riding a car | 54 | 26 | 80 |
| Injured while riding a taxi | 5 | 5 | 10 |
| Injured while riding a motorcycle | 47 | 17 | 64 |
| Injured while riding a bicycle | 54 | 12 | 66 |
| Injured while riding other | 1 | | 1 |

| | | | |
|-----------------------------------|-----|-----|-----|
| Total | 493 | 200 | 693 |
| Playing | 45 | 15 | 60 |
| Walking to school | 24 | 4 | 28 |
| Walking from school | 32 | 10 | 42 |
| Walking to work | 17 | 12 | 29 |
| Walking from work | 15 | 12 | 27 |
| Walking elsewhere | 147 | 41 | 188 |
| Riding to school | 1 | 3 | 4 |
| Riding from school | 8 | 3 | 11 |
| Riding to work | 37 | 27 | 64 |
| Riding from work | 32 | 22 | 54 |
| Riding-other | 113 | 40 | 153 |
| Working as a driver | 6 | 2 | 8 |
| Working as a seller | 5 | 2 | 7 |
| Going to or from place of worship | 11 | 7 | 18 |
| Total | 493 | 200 | 693 |

*Minor injuries represent those which resulted in less than 30days of missed activities of daily living

Table 6. Children (age<15) characteristics compared to severity

| | | Injury severity | | Total |
|--------------------|---------------------------------|-----------------|-------|-------|
| | | Minor* | Major | |
| Injuries sustained | Head | 18 | 4 | 22 |
| | Face | 10 | 3 | 13 |
| | Neck | 1 | 2 | 3 |
| | Chest | 1 | | 1 |
| | Abdomen | 3 | | 3 |
| | Back | 7 | | 7 |
| | Arms | 26 | 4 | 30 |
| | Legs | 106 | 22 | 128 |
| | General body pain | 12 | | 12 |
| | Other | 5 | | 5 |
| Total | | 191 | 35 | 226 |
| Type of injury | Cut | 71 | 11 | 82 |
| | Bruise | 72 | 4 | 76 |
| | Fracture | 15 | 20 | 35 |
| | Other | 33 | | 33 |
| Total | | 191 | 35 | 226 |
| Crash type | Hit by mini-bus | 7 | 9 | 16 |
| | Hit by car | 22 | 11 | 33 |
| | Hit by taxi | 23 | 3 | 26 |
| | Hit by motorcycle | 36 | 4 | 40 |
| | Hit by bicycle | 60 | 1 | 61 |
| | Hit by other | 1 | | 1 |
| | Injured while riding a mini-bus | 7 | 3 | 10 |

| | | | | |
|-------|-----------------------------------|-----|----|-----|
| | Injured while riding a car | 9 | 1 | 10 |
| | Injured while riding a motorcycle | 3 | | 3 |
| | Injured while riding a bicycle | 23 | 3 | 26 |
| Total | | 191 | 35 | 226 |
| | Playing | 39 | 12 | 51 |
| | Walking to school | 17 | 1 | 18 |
| | Walking from school | 23 | 5 | 28 |
| | Walking to work | 1 | 1 | 2 |
| | Walking from work | 2 | | 2 |
| | Walking elsewhere | 76 | 9 | 85 |
| | Riding to school | | 1 | 1 |
| | Riding from school | 1 | | 1 |
| | Riding to work | 7 | | 7 |
| | Riding-other | 20 | 5 | 25 |
| | Working as a seller | 1 | | 1 |
| | Going to or from place of worship | 4 | 1 | 5 |
| Total | | 191 | 35 | 226 |

*Minor injuries represent those which resulted in less than 30days of missed activities of daily living