

## The Cyclists Helmet Study in Juba, Southern Sudan, 2006

Nathan Atem MBBS<sup>a</sup>, John Lagu MBBS<sup>b</sup>, Mounir Christo MBBS<sup>c</sup> and Lucia Kur BDS<sup>d</sup>

### Abstract

Juba has a poor road network and few public transport options, with an increasing number of people riding motorised or non-motorised cycles. This study seeks to characterise the cyclists (including helmet wearing) and to use the findings to make recommendations to the concerned authorities.

The study found that most of the 3564 observed cyclists were adult males; the proportion using helmets was very small (1%). Many cyclists had an extra passenger, or were carrying a load. More than half the cyclists were riding in the middle of the road. Only 18% of the motorcycles were licensed.

The conclusion is that cyclists need information on the importance of wearing a helmet. The licensing of motorcycles is important. The road network and road signs need to improve, and public transport increased.

### Introduction

Motorcycles are the most dangerous form of motorised transport. Motorcyclists are about three times as likely as most vehicle passengers to be injured in a crash, and are 16 times as likely to die. Most of these deaths are caused by head injury. Leading safety advocates recommend the mandatory use of motorcycle helmets (1).

Each year about 1.2 million people die as a result of road traffic crashes in the world, and 50 million more are injured or disabled. Motorcyclists make up more than 50% of those injured or killed on the roads (2). In 2006 in Juba City (population 372 413 census 2008) there was an increase in the number of road traffic injuries (the majority involving cyclists) compared to the previous year (3). Half of the surgical beds in the Juba Teaching Hospital, the main referral hospital in Southern Sudan, were and still are filled with patients being treated for road traffic injuries. The ward is now nick-named "Senke ward". Senke is the name of the Chinese-made motorcycle commonly in use on the streets of Juba.

Juba City is just returning to normal following a two-decade-long civil war. The economy suffered greatly as the result of the war, one result being that Juba has a poor road network and little public transport. Many motorcycles and bicycles have been acquired as a low cost means of transport. The traffic rules and regulations are not being observed. Many motorcycles are seen without a license plate, and many cyclists do not bother to wear a helmet. Very young teenagers, some as young as 12 years old, are seen driving or as passengers. Most of the city roads are pot-holed, and there are few road traffic signs.

It is known that a helmet protects the wearer from serious head and facial injuries (1, 2). In our study we seek to characterise the cyclist in Juba by helmet status, gender and age. We also try to establish the proportion of motorcycle riders that have been licensed, and the bicycles that have got a reflector. Other factors that could increase the chances of a cyclist being injured are carrying an extra passenger or an additional load, or riding in the middle of the road.

### Materials and methods

We conducted an observational cross-sectional study of the cyclists in Juba City during the last week of October 2006. Our team included four residents from South Sudan who are participating in the Kenya Field Epidemiology Laboratory Training Programme (FELTP). During the study period the cyclists were observed over a period of two days (one was on a weekend and one was a weekday) between 7:00 am to 10:00 am and 3:00 pm and 6:00 pm. We selected four main roads. The selection was made in such a way as to avoid or minimise the chances of one cyclist being counted in more than one observation site. The four sites were:

1. Nimule road leading from Juba Bridge over the River Nile on the southeastern side of Juba City.
2. Rokon road leading out of Juba toward Rokon and Mundri on the northwestern side of Juba City.
3. Yei road leading out of Juba to Yei on the southwestern side of Juba City.
4. Juba round-about located next to the Central Park Gardens, the Judiciary complex building, the Juba Hotel and the Central Equatoria's Governor's Office at the northeastern side of Juba City.

a. Ministry of Health, Government of Southern Sudan ([atemda@gmail.com](mailto:atemda@gmail.com) for correspondence)

b Applied Epidemiology, Ministry of Health Government of Southern Sudan ([jlagu2001@yahoo.com](mailto:jlagu2001@yahoo.com))

c Applied Epidemiology, Ministry of Health Government of Southern Sudan ([molojong@gmail.com](mailto:molojong@gmail.com))

d OV/Trachoma Control Program Coordinator, Directorate of Preventive Medicine, Ministry of Health, Government of Southern Sudan ([luciaku55@yahoo.com](mailto:luciaku55@yahoo.com))

Four teams of two members each made the observations using a field-tested structured questionnaire<sup>6</sup>. One team member called out the observation and the other recorded it. For each cyclist we recorded:

- The type of vehicle (motorized or non-motorized)
- Location on the road (middle or side).
- Gender and approximate age - i.e. adult or teenager (defined as 12 to 16 years old).
- Whether or not the cyclist:
  - was wearing a helmet.
  - was carrying an extra passenger or additional load.
- Presence or absence of:
  - a license plate number and, if present, type of plate number (government, non-governmental organisation or private plate number).
  - a headlight and, if present, whether on or off.
  - a reflector on bicycles.

The data analysis was done using Epi-info 2000 software.

## Results

We observed 3564 cyclists during the two-day study period but we were unable to collect every observation on every cyclist. Hence the differences in the total observations below.

- 2166 (61%) were on motorcycles, and 1398 (39%) were on bicycles (see Figure 1).
- 14 were females.
- 3373 (95%) were adults and 188 (5%) were teenagers. (see Figure 2)
- 18 (1%) were wearing a helmet but 2561 (99%) were not. (see Figure 3)
- 738 (21%) were carrying an extra passenger.
- 308 (9%) were carrying a load.
- 1620 (46%) were riding in the middle of the road and 1939 (54%) were riding on the side of the road.
- 1515 (71%) motorcycles were not licensed. Of the 616 motorcycles that had a license plate:
  - 238 were government plate numbers
  - 20 were NGOs or Para-Statal plate numbers
  - 358 were private plate numbers.
- 433 (31%) bicycles had reflectors and 954 (69%) did not.

There were more cyclists on the road over the weekend - 2232 (63%) compared to the 1331 (37%) seen on weekdays - and more in the morning (2270 or 68%) than in the afternoon (1077 or 32%).

## Discussion

During our study we observed more motorcycles than bicycles on the roads in Juba. Few of the cyclists were females (only about 1%). This may be because most women in Juba are house-wives and only few go out to work. Or it could be due to cultural reasons where some communities do not believe it is appropriate for women to drive cycles. Contrary to the perception that there are many teenage cyclists in Juba, they accounted for only 5% of our study population, even though they occupied most of the surgical hospital trauma beds in 'Senke' ward.

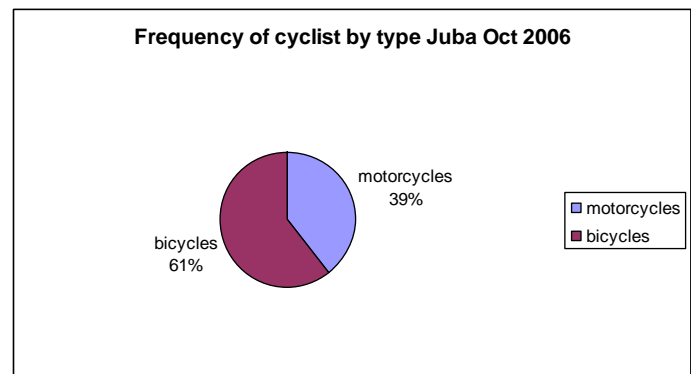


Figure 1. Frequency of cyclist by type.

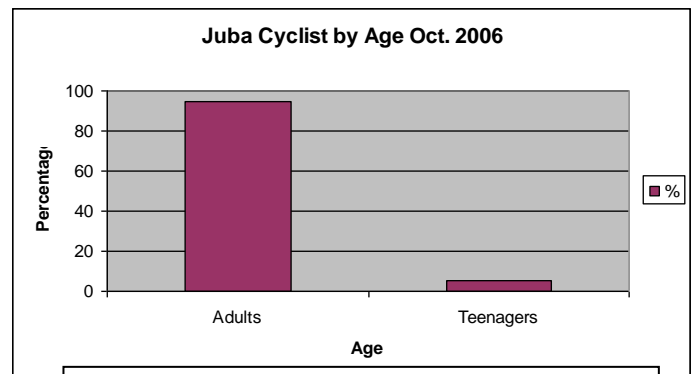


Figure 2. Cyclists by age.

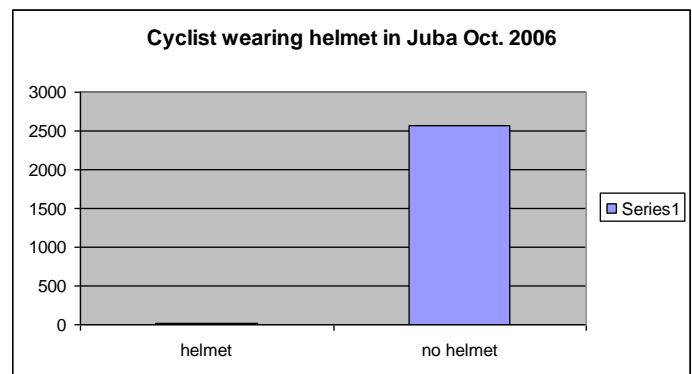


Figure 3. Frequency of helmet use.

Only 1% of the cyclists wore a helmet. This very significant finding needs an immediate remedy. The risk of head injury is two to four times higher for un-helmeted riders than for those who wear helmets (5, 6). Helmets decrease the risk of fatal head injury by 27% and reduce the risk of facial injuries by two thirds (7, 8). When there are no laws requiring the use of helmet, studies show that only about 50% of cyclists use them. A combination of legislative and educational approaches can increase helmet use. Therefore we strongly recommend that the South Sudan Legislative Assembly (SSLA) pass laws making the wearing of helmets mandatory, and that they make plans to enforce those laws.

Only 18% of the motorcycles in Juba were licensed. Licensing of motorcycles ensures that only motorcycles that are road worthy are allowed on to the roads (9). This also ensures that the motorcycle riders know the traffic rules and how to ride, and are of the legal age (over 18 years) to ride a motorcycle. Legislation requiring motorcycle lights to be on during the day has reduced the risk of fatal day time crashes by 13%. The Traffic Police department needs to do more to re-enforce this law, and to ensure that only licensed motorcycles are allowed onto the roads in Juba.

More traffic police should be on duty over weekends as there are more cyclists than on weekdays. Police are specially needed around the custom market area leading to Yei Road, an area in which we observed more cyclist traffic. Improving the road network and more road signs will make the roads safer and so help to decrease the number of road traffic injuries.

Although this study was done four years ago, the road and traffic conditions in Juba have not changed for the better and motor cycle accidents are still a major cause of hospital admission (10). So our conclusions and recommendations are still valid today.

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