Powered two-wheleers (PTWs*) in LMICs: research update

Paolo Perego





PTWs* in LMICs....Plus and Minus aspects

Positive aspects of PTWs

Easy access and affordable

Easy to use and maintain

Provide employment

Used as public transport in rural areas





Saving time in congested traffic

PTWs* in LMICs....Plus and Minus aspects









Negative aspects of PTWs

Crashes, fatalities and injuries

Risk factor:

Non-use or use of low-standard helmets

Other risk-taking behaviours:

Drinking and driving

Mobile phone use while riding

Overspeeding and braking errors

Rider's age and level of experience

There's a need for new data to develop...

Specific laws

Specific enforcement

Specific education:
driving licence curriculum
training of trainers
driving test reliable and effective



Informal Document No. 3

Principles for Governance

Guidance should encourage data collection

Guidance should include education for the driver and passengers

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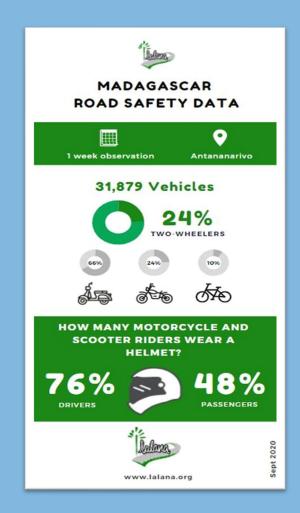
> Policies for Vulnerable Road Users (VRU)- focus on road safety challenges in low- and middle-income countries as identified during the South-East Asia project

Submitted by Italy, IRTE, University of Birmingham (UK), and Johns Hopkins

This informal document, optimizing the outcomes of the webinar held in March 2021, has elaborated some guidance references to address non-regulated transport modes commonly used in South-East Asia and other regions. WP.1 is invited to consider these guidelines in the context of the prominent role played by non-regulated transport modes in the regions where such transport is commonly utilized due to economic and social necessities.

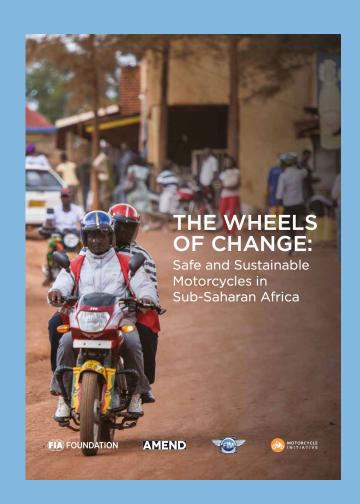
New data...

Helmet wearing rate (WHO 2018)



New data...

THE WHEELS OF CHANGE: Safe and Sustainable Motorcycles in Sub-Saharan Africa (Bishop & Courtright 2022)



New data...

Knowledge, attitudes of rider behaviour (Perego & Biassoni 2016) Conference Proceedings SARF/IRF/PIARC Regional Conference for Africa 2018

Bodahoda drivers' behaviour

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Abstract In Tanzania between 2006 and 2014, the number of motorcycle riders in Tanzania. This is why researchers and road registrations for 2 or 3 wheeled vehicles has been climbing, with 20,117 in 2006 and 185,100 in 2014. In 2014 more than 50% of registered vehicles were motorized 2 and 3 wheelers, and 22% of the deaths caused by crash accidents were drivers of this kind of vehicle One of the great challenges for countries as Tanzania, is to confront the fatalistic beliefs of commercial (called 'Bodaboda') and recreational African motorcycle drivers and improve their knowledge of the road. This study is the second part of a traffic psychology project for Bodaboda drivers of the Arusha region in Tanzania. A first version of the questionnaire was distributed in Arusha city in March-April 2016. A final version of the BbQ was written in Swahili after a focus group with Swahili-English speakers and was distributed to 513 Bodaboda drivers in Arusha in December 2016. The distribution was carried out by 14 trained interviewers. The 513 subjects replied to 46 questions to investigate 7 different sections: demographic information, protective equipment, passengers, maintenance of motorcycle, police fines and bribes, driver's crash history and reason. 47.9% of the Bodahoda drivers have been involved in a crash, the most frequent cause of is poor driving skill (56.1%) and for 10.5% of the subject crash-avoidance was impossible because crashes are predestined. The Bodahoda drivers was also recorded with a video camera in Arusha in August 2017 in order to understand the gap between questionnaire's answers and real driving behaviors.

Keywords: road safety: taxi motorcycle: driver's behavior:

I. INTRODUCTION

Every year, more than 1.2 million deaths are directly caused by road crashes [1], and more than 75 million road users are injured and a further fifty million road users are seriously injured [2]. The severity of these injuries and fatalities is not homogeneously distributed throughout countries in the world. The low- and middle-income countries (LMIC) register more than 90 percent of the world's traffic fatalities but they only account for 50 percent of motorized traffic in the world [1]. In sub-Saharan Africa the average mortality rate per 100,000 population is 26.6, while the global average is 17.4. In the country of Tanzania, the situation is even more alarming, the WHO estimates that more than 16,000 people are killed in traffic each year, which equals 32.9 traffic deaths per 100,000 population [3]. The Tanzanian Traffic Police reports that the highest share (33%) of the road related fatalities in Tanzania in 2015 consisted of motorcycle riders [4]. While these numbers are alarming by themselves, the number of injured and killed motorcycle riders is projected to increase. There were approximately 800,000 motorcycles registered in Tanzania in 2014, and their number increases by 148,000 every year [1][5]. The high number of motorcycle rider fatalities and the rapid increase in the number of motorcycles calls for effective measures to be undertaken to improve the road safety of

safety NGOs have started to investigate critical road user behavior that influences road safety and to try to defeat one of the great challenges for countries as Tanzania, confront the fatalistic beliefs of commercial and recreational African motorcycle drivers and improve their knowledge of the road [6]. Increased attention has been given to the role of so called Bodaboda drivers, who use their motorcycles commercially to transport goods or passengers. Since 2010, Bodaboda drivers are obligated to register with a Bodaboda organization, which allows directed targeting of safety relevant behavior of Bodahoda drivers through these organizations [7]. Existing regulations mandate that Bodaboda drivers are only allowed to transport one passenger, need to wear a high visibility safety vest, use a motorcycle helmet, and only transport passengers that also use a helmet. Road traffic legislation, regulation, and strict police enforcement are proven to be effective methods to increase road safety [8]. Through Bodaboda organizations, commercial motorcycle drivers in Tanzania are subject to special regulations and they are therefore a useful object of study. Prior research has shown an impact of road safety education of the Bodaboda drivers on their use of motorcycle helmets, safety vests, and the number of the crashes they are involved in [5][9]. This study aims to investigate safety relevant road behavior of Bodaboda drivers in detail. The Bodaboda questionnaire can help researchers in low-and middle-income countries to better understand the relationship between behavior, fatalistic beliefs, mental representation of risk and safety in commercial motorcycle drivers, and thereby allow targeted road safety programs and legislation [10]. Ultimately the better understanding of motorcycle drivers' behavior can prevent an increase in the number of road crashes.

The Bodaboda questionnaire was developed in an iterative process as part of a project on road safety in Tanzania undertaken by researchers from the Università Cattolica del Sacro Cuore of Milan, from Center for Accident Research and Road Safety of Queensland (CARRS-Q) and from Technishe Universität of Berlin. A first version of the questionnaire with 37 items was developed from the ground up in English and then translated to Swahili. This version was divided in 6 different sections: socio-demographic information, use of the protective equipment as helmet and vest, behavior of the passengers, maintenance of the motorcycle, number of the police fines and driver's crash history. This first draft of the Bodaboda questionnaire (BbO) was distributed to 54 Bodaboda drivers in Arusha city during the months of March and April 2016. The results of the data analysis of the first version highlighted some problems of understanding the questions and also some

Bodaboda Questionnaire Results

27.5 years old (SD=5.67), 62% married, and 59% have children

42% declared to use 'always' the helmet.

17 passengers per day (SD=5.60), and 23% declared to carry more than one passenger 'often'

69% took fines, and 48% bribed the police

49% were involved in a crashes

3.3% identified 'Lack of Attention' as the reason of crashes





New data and research update

Motorcycle Rider Behaviour Questionnaire (MRBQ) (Elliot et al. 2007)

Demographic information

Crash information

Different type of motorcycle behaviours

- Traffic errors Speed violations Stunts
- Safety equipment Controll errors

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Errors and violations in relation to motorcyclists' crash risk

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This study was conducted to: (a) develop a questionnaire that reliably measures the behaviour of motorcyclists and (b) test which types of behaviour of motorcyclists and (b) test which types of behaviour of motorcyclists and (c) test which types of behaviour of motorcyclists and (d) test which types of behaviour of motorcyclists and (d) test which types of behaviour of motorcyclists and (e) test which types of behaviour of motorcyclists and (e) test which types of behaviour of motorcyclists and (e) test which types of behaviour of motorcyclists and (e) test which types of behaviour of motorcyclists and (e) test which types of behaviour of motorcyclists and (e) test which types of behaviour of motorcyclists and (e) test which types of behaviour of motorcyclists and (e) test which types of behaviour of motorcyclists and (e) test which types of behaviour of motorcyclists and (e) test which types of behaviour of motorcyclists and (e) test which types of behaviour of motorcyclists and (e) test which the type of the predict motorcyclists' crash risk. A Motorcycle Rider Behaviour Questionnaire (MRBQ), consisting of 43 items to measure the self-reported frequency of specific riding behaviours, was developed and administered to a sample of motorcyclists (N = 8666). Principal components analysis revealed a 5-factor solution (traffic errors, control errors, speed violations, performance of stunts and use of safety equipment). Generalised linear modelling showed that, while controlling for the effects of age, experience and annual mileage, traffic errors were the main predictors of crash risk For crashes in which respondents accented some degree of blame, control errors and speed violations were also significant predictors of crash risk Implications of the findings are discussed in relation to deciding which countermeasures may be most effective at reducing motorcycle casualty rate © 2006 Mark A. Elliott, Published by Elsevier Ltd. All rights reserved.

Keywords: Motorcycle Rider Behaviour Questionnaire (MRBQ); Errors; Violations; Motorcycle; Crash risl

Statistics for Great Britain show that motorcyclists are more tackled to reduce motorcyclists' crash risk. at risk of being killed or injured in road traffic crash than 550 motorcycle riders (including moped riders) killed in road involved in recorded injury (all severities) crashes (Department cycle crashes happen. In thinking about the different factors olved in motorcycle crashes, it is useful to consider motorcycling as a system involving three elements: (a) a machine element (i.e., the motorcycle), (b) an environmental element (e.g., traffic conditions, road type and conditions, weather conditions) and (c) a human element (i.e., the rider1). Extensive research in road safety has provided a great deal of knowledge about risk factors associated with the first two of these elements (for reviews see

Refs. Elliott et al., 2003: Huang and Preston, 2004), Howeve relatively little is known about how the human element can be

A number of studies have demonstrated that the risk of a any other type of vehicle users. In 2004, there were over motorcyclist having a crash increases with exposure and falls with age and riding experience (e.g., Chesham et al., 1993; crashes, 6281 killed or seriously injured (KSI) and over 24,300 Lin et al., 2003; Sexton et al., 2004; Taylor and Lockwood, 1990). However, variables such as age, experience and expofor Transport, 2005). In order to reduce these casualty rates, it is sure provide limited information about how to improve rider important to gain an understanding of the ways in which motorrisk is potentially more useful because behaviour is potentially amenable to change via road safety interventions

Several studies have investigated the relation between motor cycle riding behaviours and crash risk. Riding behaviours that have been found to increase crash risk include riding too fast (e.g., Waller and Carroll, 1980; Lin et al., 2003; Wells, 1986), drink-riding (e.g., Fell and Nash, 1989; Lin et al., 2003) and poor observation and signalling at junctions (e.g., Wells, 1986). However, what would be beneficial is a tool that can be used to reliably measure the different types of motorcycle riding behaviour that * Corresponding author at: Department of Psychology, University of Strathstudy to investigate which are the most important risk increas ing factors. This would inevitably provide clues about which form of remedial action should be taken to reduce motorcyclists crash risk. For example, if a type of risk increasing behaviour that predicted crash risk was known to be deliberate, then the

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E-mail address: melliott@TRL_co.uk (M.A. Elliott). We acknowledge that car drivers have a role to play in road traffic crashes involving motorcyclists. However, this study focuses solely on the motorcycle rider since a great deal is already known about car driver behaviour.

Partnerships

Tanzania Arusha Technical College

Nigeria Federal University of Kashere

Madagascar ONG Lalana



Swahili



Hausa



Malagasy

Procedure

Context and culture

30 Wear body armour (elbow pads, shoulder pads, knee pads, etc)
NO

39 Have trouble with your visor or goggles fogging up
NO

9 Attempt to overtake someone that you had not noticed to be signalling a right turn
Attempt to overtake someone that you had not noticed to be signalling a left turn

41 Ride when you suspect you might be over the legal limit for alcohol
Ride when you suspect you might be drunk

Done

Translation and back translation

23 Attempt to do, or actually do, a wheelie23 Gwada yin, ko kuma yin tuki a bisa tayan baya kadai

Done

Distribution of MRBQ and data analysis

Work in Progress

Work in Progress

Tanzania Arusha Technical College

Nigeria Federal University of Kashere

Madagascar ONG Lalana



208



154



177

Issues faced

The reluctance of the riders to answer. They believe that the interviewer is an agent of the local administration or the Police to spy on motorbikes or to target drivers without a driving licence.

Many riders leave without being able to answer the questionnaire until the end if a customer asks them for a ride.

Summary of the Preliminary Results

The state of the road infrastructure impacts the driving style of motorcyclists.

Use of brand new roads by young people to test the power of their motorbikes, to speed, to organise running events.

Non-existence of laws and texts regulating the use of motorbikes.

Summary of the Preliminary Results

There is a lack of adequate training centres.

Many motorcyclists do not have a proper licence to ride a motorbike.

Many motorcyclists do not know how to ride a motorbike.

Increase in uneducated and unqualified people working as motorbike taxi drivers.

Thank you

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