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Victims of Road Traffic Accidents in Dakar: A New Group of Occupants Identified

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Abstract

Background: Road traffic accidents remain an unresolved public health problem. They conventionally affect three categories of victims: drivers, passengers and pedestrians. In Senegal, "a fourth group" has been identified, occupants of the public highway. Our general objective is to study the latter under clinical and epidemiological approaches. **Methods:** This is a descriptive analytical study of 153 patients taken from a population of 1450 ACR victims over a period of 06 months (January 2018-June 2018) carried out at the Idrissa Pouye General Hospital. **Results:** The most represented age groups were adolescents and young adults at 65.36%. The sex ratio was 1.43. All socio-economic classes were found but the primacy went to pupils and students 34.64%. More than half of the accidents took place in urban areas. We noted that 71.24% of the victims were on the sidewalk or the roadway. The most noted mechanism was 94.77% vehicle skidding. Eighty-six-point thirty-seven percent suffered direct shock trauma resulting in a significant number of bruises. Most lesions were located in the lower limbs at 83.7%. **Conclusion:** Our work shows that this group of victims exists because of 1 in 10 patients. This study deserves to be carried out in all hospitals. These too many otherwise preventable victims can be considered the fourth victim of road traffic accidents.

Keywords

Accident, Road Traffic, Occupants, Public Road

1. Introduction

Road traffic accidents are a major global public health issue today. Due to the growing development of the road network, they cause many deaths all over the world. This situation weighs heavily, 90% of deaths due to traffic accidents occur

in our low- and middle-income countries [1]. In 2013, Africa had the highest road fatality rates in the world (over 52% compared to the global average) [2]. This massacre conventionally affects three categories of victims: drivers, passengers and pedestrians who are more exposed and respond to the term vulnerable users [3]. In Dakar, "a fourth group" was identified during road traffic accidents and was born from a continuous conflict between vehicles and these permanent regular and irregular occupants. Regular occupants are persons temporarily stationed in order to carry out their mission (safety and road traffic) like police officers, gendarmes, security guards. Irregular occupants are people standing or motionless and street vendors, beggars, the homeless, the mentally ill who occupy the road for recreational or commercial activities.

The objective of this study was to study, using epidemiological and clinical approaches, regular and irregular occupants of public roads, victims of road traffic accidents and admitted to the orthopedic and trauma surgery department of the University Hospital Idrissa Pouye between January 01, 2018 and June 30, 2018, and to carry out targeted prevention concerning morbidity and mortality on this 4th group of vulnerable victims who are either injured or killed.

2. Methods

This is a single-center descriptive prospective study carried out over a six-month period from January 01, 2018 to June 30, 2018 and involving a population of 1450 patients who were victims of road traffic accidents in the emergency department of the Idrissa Pouye hospital (HOGIP). Our sample consisted of 153 regular and irregular occupants of the public highway. Were excluded patients who were not victims of road traffic accidents, and other victims of road traffic accidents: pedestrians, passengers, and drivers.

The qualitative analysis of study was carried out with the qualitative version of Sphinx software, after the transcription by hand of the data. The quantitative data is analyzed with the use of the same software with a significance level of $p < 0.05$.

3. Results

During our study period we received 7437 patients in the trauma emergency department of HOGIP. Among these patients, 1450 patients suffered from a traffic road accident, or 19.5% of cases. We noted 539 drivers, 349 passengers, 409 pedestrians and 153 occupants of the public highway.

This fourth group, called highway occupants, represents 10.55% of our study population.

This new type of victim has been split into two groups:

- Regular occupant (8): 5.23%.

- Irregular Occupant (145) 94.77% of total occupant which is the interest of our study (**Figure 1**).

The predominant sex in our series is the male sex, which is around 90 cases, or 58.8%. The age groups of adolescents and young adults were the most represented,

at 65.36% (respectively 30.72 and 34.67%) (Table 1).

Pupils and students represent the socio-professional category most affected, ie 34.64%. In our study, 71.24% of patients were on the sidewalk (52.94%) or on the road (18.3%) at the time of the accident (Figure 2, Table 2).

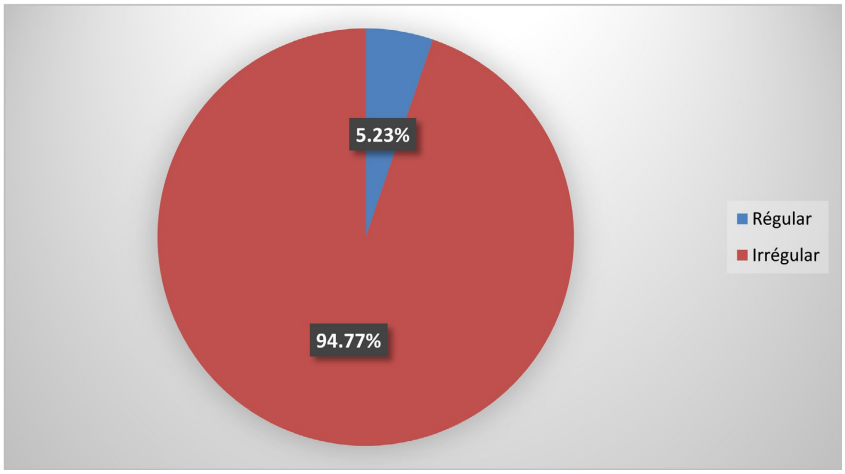

Figure 1. Frequency of regular and irregular occupants of public roads.

(a) (b)

(c) (d)

Figure 2. Irregular occupants of the public roads. (a) Beggar on the stationary sidewalk at high risk of ACR in the event of a skidding car; (b) Street vendors barely working at the Sandaga market weaving their way between vehicles and motorcyclists; (c) Water saleswoman slipping between vehicles with a risk of getting caught; (d) Fixed street vendors installed on the sidewalk obstructing pedestrian traffic.

Table 1. Distribution of patients by age group according to WHO.

Age	Total	Perrcentage
Infants 1 - 24 month)	2	1.31
Small children (2 - 7 years)	18	11.76
Children (7 - 14 years)	11	7.19
Teenager (15 - 18 years)	47	30.72
Young adult (18 - 39 years)	53	34.64
Adult (40 - 59 years)	16	10.46
Gérontins (60 - 74 years)	2	1.31
Old Men (75 - 85 years)	3	1.96
Great Old Men (+85 years)	1	0.65
Total	153	100

Table 2. Distribution of patients according to the location of the accident.

Site	Victims	Total	Percentages
Pavement (18.3%)	Street Vendors	7	4.58
	Security agents	7	4.58
	Drivers	8	5.23
	Car Receiver	4	2.61
	Police Officer	1	0.65
	Beggar	1	0.65
BUS STOP (Sidewalk) (52.94%)	Officials	6	3,92
	Students	53	34,64
	Retirees	1	0,65
	Wrestler	1	0,65
	Service provider	12	7,84
	Trades People	13	8,5
	Household	13	8,5
PUBLIC SPACE (28.76%)	Children	24	15,69
	Polisher	1	0,65
	Car washer	1	0,65

The most common mechanism is the skidding of vehicles (94.77%). 62.7% of accidents occurred in urban areas against 37.3% in the suburbs.

94.8% of patients were referred to hospital by others. The predominant lesion is contusion of the soft parts, 54.90%, followed by fracture lesions (26.14%) (Table 3).

Table 3. Distribution according to the nature of the lesions.

	Total	Percentage
Closed fracture	40	26.14
Open fracture	2	1.31
Contusion	84	54.90
Wound	11	7.19
Sprain	16	10.46

90.8% of the patients were mono-injured. No mortality was noted. According to the topography, 83.7% of the lesions concerned the lower limbs. 96.7% of patients received outpatient treatment.

29.4% of patients received orthopedic treatment, and 9.2% of patients received surgical treatment.

4. Discussion

In the face of increasing poverty and unemployment, the informal economy has come to the rescue of the formal economic model in a way. In Senegal, where unemployment and underemployment affect more than a quarter of the working population, the informal economy is seen as a potential source of job creation and income. It generates 97% of job creation and employs 95% of the workforce, according to the World Bank [4]. According to a study about urban space management in Dakar, commercial activities shared between informal and formal sectors take places in all forms with street stalls spread throughout Dakar department [5].

Regular and irregular occupants of public roads represent 10.55% or 1/10 of our study population. This substantial figure is believed to be due to the disorder in the occupation of the public highway by beggars and various businesses, street vendors, street vendors.

Failure to respect the construction standards of our sidewalks is also at the root of this scourge. It should be noted that the exponential increase in the number of transport vehicles and non-compliance with the highway code also favor the exposure of security forces and agents to accidents when regulating road traffic.

At the end of our work, we noted a clear male predominance with 90 cases or 58.8%, for a sex ratio (M/F) of 1.43. Indeed, in our regions, men occupy a large place in society because of the extent of these activities compared to women. This male predominance is also found in the series of Diarra, Setodji (20%), Chekaro and Lassare (23%), and Diakité (19%) [6]-[9].

It follows from our series that adolescents and young adults were the most represented at 65.36%. This could be explained by the fact that they represent the

most active segment of the population. These results are similar to those obtained by several authors including Diarra and others [8] [10]-[14]. Most accidents take place during the day [8]. This corresponds to the moment when pupils and students are on their way to their respective establishments and where they can be distracted.

In other countries of the world, socio-economic status is a major determinant of pedestrian accidents. In general, pedestrians coming from poor communities are more exposed than others to the risk of accidents. In the United Kingdom, in the most disadvantaged socio-economic class, the risk of accidents for child pedestrians is more than twice as high as in the more affluent categories [15]. Pedestrian crashes were four times more frequent in poor neighborhoods in Orange County, California, United States of America than in others [16]. In Hyderabad (India), children from households in the highest income quintile were much less likely to be in an accident [17].

The locations of pedestrian accidents vary greatly from country to country. In high-income countries, there are more accidents in urban areas than in rural areas, while in some low- and middle-income countries the reverse is true. In our study, more than half of the accidents took place in urban areas, *i.e.* 62.7%. For example, around 70% of fatal pedestrian accidents in the European Union and 76% in the United States of America occur in urban areas [18] [19].

We noted that 71.24% of the victims representing more than 2/3 of our sample were on the sidewalk (52.94%) or on the roadway (18.3%) at the time of the accident. This would be secondary to a considerable increase in public transport vehicles. The disorderly occupation of the roadway and sidewalks by street vendors, by public transport users would explain this frequency.

Most accidents involving a pedestrian and a vehicle result from frontal impacts [20]. Eighty-three-point seven percent of the lesions were located in the lower limbs which are highly exposed areas and subject to direct shock.

In our victims, it appears that bruises are the most frequent lesions and more than 90% presented a single lesion because all the traumas were at low energy. In our study, no mortality was detected. This could be explained by the brevity of our study period and the existence of other reference centers for road injuries in the Senegalese capital.

Injury prevention cannot be undertaken by one department. It must fit into a larger set of activities including development and management of road infrastructure, development of safer vehicles and better law enforcement, transport planning, establishment of health services, hospital services and child protection services and urban planning and land use planning. Senegal, which has one of the densest road networks in Africa, is very concerned about injuries due to road accidents which are one of the main causes of loss of human and material life. Between 2005 and 2008 the country recorded an average of 3300 accidents causing an average of 350 deaths per year [21]. Primary prevention perspectives have been identified:

- Creation of a coordination unit for injury prevention activities at the Ministry

of Health and Social Action.

- Improvement of the health care offer for victims of traffic accidents.

5. Conclusions

Road traffic accidents remain an unresolved public health problem. Each year, 1.2 million people die on the roads with no less than 50 million injured. Although it exists in all countries, this scourge is unevenly distributed. Death rates are highest in Africa. In Senegal, between 2005 and 2008, the country recorded an average of 3300 accidents causing an average of 350 deaths per year [21]. This work was initiated after several questions as to whether there would not be "too many victims" among pedestrians.

These circumstances result from non-compliance with construction standards for bus stations and sidewalks, disorderly occupation of the roadway by street vendors, bus users and security forces.

This new concept of illegal occupant of the public highway prompts us to suggest the following recommendations:

- Organize information and public awareness campaigns relating to the aetiologies of road traffic accidents.

- Compliance with sidewalk construction standards.

- Development of roadsides and bus stops to absorb shocks in the event of an impact.

- Multiplication of main traffic lanes.

- Compliance with the highway code under the supervision of the security forces.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

[1] Organisation mondiale de la santé (2018) Principaux repères sur les accidents de la route. http://www.who.int/fr/news-room/fact-sheets/detail/road-traffic-injuries

[2] Norman, Leslie, G. and World Health Organization (1962) Les accidents de la route: Épidémiologie et prévention. https://iris.who.int/handle/10665/41342

[3] Organisation mondiale de la santé (2013) Rapport de la situation sur la sécurité routière dans le monde. Prévention de la violence et du traumatisme. https://www.who.int/fr/news-room/fact-sheets/detail/road-traffic-injuries

[4] CCIAD (2009) Le commerce des marchands ambulants à Dakar. Dossier économique. https://streetnet.org.za/wp-content/uploads/2013/01/Senegal-1.pdf

[5] Khouma, M. (2017) Commerce et gestion de l'espace urbain à Dakar: Enjeux, logiques et stratégies des acteurs. Thèse, Histoire et science, Université Normandie.

[6] Chekaro, B. and Lassare, S. (2018) Road Accidents in Niger: Analysis for Design of a Road Safety Action Strategy. http://worldcat.org/isbn/07618980

[7] Diakité, S. (2001) Epidemiology of Trauma Emergencies at Donka. Thesis Med N° 20, University Hospital Conakry.

[8] Diarra, A. (2003) Approche épidémiologique des accidents de la route. A propos de 322 cas reçus au service des urgences chirurgicales de l'hôpital Gabriel Toure de juillet à décembre 2001. https://bibliosante.ml/handle/123456789/753

[9] Setodji, K. (1998) Épidémiologie des accidents de la route au CHU-TOKOIN à propos de 2028 cas du 1er janvier au 31 Décembre 1998. Thesis Med., Togo.

[10] Doumbia, F. (2005) Epidemiological and Clinical Study of Road Accidents among Pedestrians in the Orthopedic and Trauma Surgery Department of Gabriel Toure Hospital. Thesis Med n° 123, Bamako.

[11] Li, H. and Ma, Y. (2021) New Injury Severity Score (NISS) Outperforms Injury Severity Score (ISS) in the Evaluation of Severe Blunt Trauma Patients. *Chinese Journal of Traumatology*, **24**, 261-265. https://doi.org/10.1016/j.cjtee.2021.01.006

[12] Shen, M., Wang, C., Chen, H., Rui, Y. and Zhao, S. (2016) An Update on the Pauwels Classification. *Journal of Orthopaedic Surgery and Research*, **11**, Article No. 161. https://doi.org/10.1186/s13018-016-0498-3

[13] Sicard, A. (1978) La route meurtrière. Médecine d'Afrique Noire, 3ème Edition, 25.

[14] Zimmerman, K., Mzige, A.A., Kibatala, P.L., Museru, L.M. and Guerrero, A. (2012) Road Traffic Injury Incidence and Crash Characteristics in Dar Es Salaam: A Population Based Study. *Accident Analysis & Prevention*, **45**, 204-210. https://doi.org/10.1016/j.aap.2011.06.018

[15] Sanogo, A. (2001) Approche épidémiologique des accidents de la route dans le District de Bamako, Bilan de 5 ans d'observation de 1994-1998. Thesis Med. N° 33, Mali.

[16] Chakravarthy, B., Anderson, C.L., Ludlow, J., Lotfipour, S. and Vaca, F.E. (2010) The Relationship of Pedestrian Injuries to Socioeconomic Characteristics in a Large Southern California County. *Traffic Injury Prevention*, **11**, 508-513. https://doi.org/10.1080/15389588.2010.497546

[17] Danielle, C. MSD Manual of Pediatric Physeal Fractures (Growth Plates). Department of Emergency Medicine, University of San Francisco.

[18] Damsere-Derry, J., Ebel, B.E., Mock, C.N., Afukaar, F. and Donkor, P. (2010) Pedestrians' Injury Patterns in Ghana. *Accident Analysis & Prevention*, **42**, 1080-1088. https://doi.org/10.1016/j.aap.2009.12.016

[19] Krug, E. and Ward, D. (2013) Pourquoi la sécurité des piétons est cruciale dans sécurité des piétons. Manuel de sécurité routière pour les décideurs et les intervenants. Genève, Chap. 1, p. 3.

[20] Crandall, J.R., Bhalla, K.S. and Madeley, N.J. (2002) Designing Road Vehicles for Pedestrian Protection. *British Medical Journal*, **324**, 1145-1148. https://doi.org/10.1136/bmj.324.7346.1145

[21] Direction générale de la santé du Sénégal (2018) Prévention des traumatismes et la violence. 3-6. https://iris.who.int/bitstream/handle/10665/43732/9789242595253_fre.pdf