

## On-transit actions and outcomes of injuries from road accidents in Makueni, Kenya: the association

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### Article Info

#### Article history:

Received Oct 11, 2021

Revised May 12, 2022

Accepted Jun 20, 2022

#### Keywords:

First Responder

On-transit actions

Outcomes of Injuries

Pre-hospital emergency care

### ABSTRACT

Makueni County experiences a significant burden from traffic related injuries that often results to deaths and other complications. It is not clear whether the deaths and the complications are related to the actions of the responders. The purpose of this study was to provide information to enable the development of policies and programmes aimed at reducing fatality rate and life-long complications from road accidents in the Trans-African highway and other highways in Kenya. The study used the mixed method approach and applied the cross-sectional study design. Data was collected from 427 First Responders and 474 patients. Statistical tests applied included Chi-square, correlations and multinomial logistic regression. Study findings show that pre-hospital emergency care was provided to less than half (48%) of those with road traffic injuries. Study findings indicate a significant ( $p$ -value  $<0.05$ ) relationship between outcome of injuries with helping with breathing, covering patients for warmth and positioning during transportation. Those transported on their side were less likely to end up with severe injury outcomes (OR 95% CI, 0.016 (0.001-0.305), 0.006). The study recommends empowerment of First Responders with appropriate First-aid equipment and skills for effective care on-transit to the health facilities.

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## 1. INTRODUCTION

Road traffic injuries pose a global public health challenge and adversely affects the society due to its effect on the productive age groups [1], [2]. They lead to the loss of over 1.2 million lives and cause non-fatal injuries to about 50 million people all over the world annually [3]. The 2015 World Report on road safety indicates that 68 countries have recorded an increase in the number of deaths from 2010 of which 84% are from the developing countries [4]. The increased mortality in developing countries is to some extent attributable to rapid motorization without a simultaneous investment in road safety strategies [5].

Road traffic accident injuries significantly contribute to hospital admissions and mortality in Kenya. In Kenya, these injuries are responsible for about 28% of the injuries sustained here and are the 9<sup>th</sup> leading cause of death [6]. Data from the National Transport and Safety Authority (NTSA) in Kenya indicates that more than 3572 people died in Kenya due to road traffic accidents in 2019 [7], [8].

The injury experience of a population can best be presented as a pyramid. The different levels in the pyramid are related to the level of medical treatment, which also represents the injury severity [8]. Pre-

hospital emergency care interventions can only reduce morbidity and mortality if instituted early enough before conveyance of casualties for definitive care [9]. Care should begin at the scene of an incident and continued up to the receiving health facility as need arises. Most deaths in the first hour after an injury are either due to airway blockage, respiratory failure or uncontrolled bleeding [10].

Deaths and other complications can be reduced by providing first-aid to casualties immediately and transferring casualties to an appropriate definitive care centre. Reduction in the impact of road traffic injuries can contribute to the attainment of the sustainable development goals (SDGs) that are aimed at promoting well-being at all ages by reducing injuries and the deaths by 50 percent by 2020 and beyond [11], [12].

The above trend on road accidents deaths and disabilities can be addressed by an efficient and effective emergency medical service (EMS) [13], [14]. The history of EMS can be linked to the story of the Good *Samaritan* in the Holy Bible (Luke 10:30-37) [15]. The history of the ancient wars provides a number of examples of organized methods of on-transit emergency care of the injured persons and the sick. Emperor Julius Caesar of the Roman Empire positioned battleground medics among his troops while Napoleons chief surgeons established horse drawn wagons operated by battlefield caregivers during the French revolution, and named them as the Flying Ambulances [16], [17].

Emergency care is an essential component of curative healthcare. It is also a vital component of primary care as stated in the constitution of Kenya which states that every person should access emergency treatment. Best practices indicate that, medical attention should be given within 30 minutes from the time of injury, most preferably at the site of injury and continued the way to hospital. On-transit care should be equated to care in a moving ward and is an important component care of emergency medical services [18].

The World Health Organization has recommended that the people involved in emergency care should use the equipment and supplies that matches their knowledge and skills to avoid causing further harm to the injured person [4]. In Makueni County pre-hospital care is mostly provided by Bystanders and often some of the casualties die at the scene or on-transit to the health facilities. It's not clear whether the deaths or the complications are related to the actions of the responders. This study therefore sought to determine the association between on-transit actions with outcomes of traffic related injuries in Makueni County, Kenya. The study provides recommendations based on the local situation and provides evidence and facts for development of policies and programmes to reduce case-fatality rate, average length in hospital and life-long disabilities from road traffic accidents in the Trans-African highway and other highways in Kenya.

## 2. RESEARCH METHOD

The researcher applied the mixed methods approach and applied a cross-sectional study design from 17/10/2019 to 15/5/2020. Quantitative data was collected first and was explained further by collection of the qualitative component. The sample size was worked out using the Fishers formula [19]–[21]:  $n = z^2 pq / d^2$ .

where,  $n$ =anticipated sample size (when population is greater than 10,000);  $Z$ =standard normal deviate set at 1.96 which corresponds to the 95% confidence level;  $P$ =the proportion in the target population estimates to have a particular characteristic (50%). The proportion of First Responders in the population is not known and hence this will apply to enable the researcher obtain enough observations;  $q=1.0-p$ ;  $d$ =degree of accuracy desired, set at .05. Then the sample size was:  $n = (1.96)^2 (.50)(.50) / (.05)^2$ ;  $n=384$ .

The calculated sample size was further increased by 10% to cater for non-responses. Hence the final sample size was 423. Approximately 423 First Responders who assisted 474 persons inflicted with road traffic injuries who were managed in six hospitals along the major roads in Makueni County were selected for this study. The responders were matched with an individual suffering from traffic related injuries who sought for treatment in Mitoandei, Sultan Hamud, Kibwezi, Tawa, Makindu, and Makueni Referral Hospitals. Information about pre-hospital phase care and the outcome of the injuries amongst the casualties was obtained from the First Responders, the patients themselves and the medical records in the six hospitals along the major roads in Makueni County.

The Statistical Package for Social Sciences (SPSS Version 25) was applied in the analysis of quantitative data. Presentation of findings was through the use of frequency tables and charts. Cross tabulation was used to compare variables. Bivariate analysis explored the association between two variables while multivariate analysis obtained the predictor variables. Principal component analysis was conducted on the significant variables in bivariate analysis.

### 3. RESULTS AND DISCUSSION

#### 3.1. Results

##### 3.1.1. Conveyance mode and relationship with outcome of injuries

Bivariate analysis indicates that the highest (77.3%) proportion of cases treated and discharged with mild injury outcomes were conveyed to the health facility through other modes of transport (including private cars and motorbikes) other than an ambulance. The most frequent (79.3%) reason for preference for a particular mode of transport for the casualties released home with mild injury outcomes was its availability. This is confirmed by majority of discussants who said that “there are many (*bodabodas*) motorbikes here. Response depends on the distance to the scene of accident”. This is evidenced by the discussants in all the groups who said that “many accidents cost huge amounts of money and there is normally no refund especially when the ambulance is not available. We engage private vehicles and contribute to have the injured person transferred to the hospital”. Severe outcomes were higher (19.7%) among the patients transported to the health facility using the ambulance. This is confirmed by the discussants in majority of the groups said that “those received fast are those taken through ambulances to the hospital because they are thought to be serious”. The highest number (25%) of cases with severe outcomes was recorded in the cases where the reason for preference for a particular mode of transport was other reasons for preference such as comfort, efficiency and faster handing over at health facility. Statistical tests performed indicate a significant relationship ( $p<0.05$ ) between conveyance mode ( $p=0.001<0.05$ ), reasons for preference to mode of transport ( $p=0.001<0.05$ ) and outcome of injuries as shown in Table 1. A significant correlation was noted between conveyance mode and destination triaging of the casualties ( $r=-0.922$ ;  $p=0.001<0.05$ ).

Table 1. Conveyance to health facility

Variable and values labels (n=427)	Outcome at disposition from the health facility			Total (N%)	$\chi^2$	df	p-value
	Mild (n%)	Moderate (n%)	Severe (n%)				
<b>Conveyance health facility</b>							
Ambulance	71 (53.8)	35 (26.5)	26 (19.7)	132 (100)	36.87	2	0.001*
Other modes of transport	228 (77.3)	19 (6.4)	48 (16.3)	295 (100)			
<b>Reason for preference of mode of transport</b>							
Cost	55 (69.6)	10 (12.7)	14 (17.7)	79 (100)	49.07	6	0.001*
Availability	169 (79.3)	13 (6.1)	31 (14.6)	213 (100)			
Care on transit	39 (76.5)	4 (7.8)	8 (15.7)	51 (100)			
Others	36 (42.9)	27 (32.1)	21 (25)	84 (100)			
Total	299 (70)	54 (12.6)	74 (17.3)	427 (100)			

Note: \*significant  $p<0.05$

##### 3.1.2. Relationship between on-transit care and outcome of injuries

Bivariate analysis indicates that the most frequent (67%) action on transit demonstrated by the First Responders was accompaniment of the casualties to the health facility. The casualties accompanied by responders to the health facility had mild injury outcomes. This concurs with discussants in Focus Group Discussions (FGDs) who said that “we hold the injured to avoid movement”. We hold the injured leg upside down”.

The highest (27.4%) number of patient discharged with moderate injury outcomes included those covered for warmth by responders. The highest proportion (40%) of casualties with severe injury outcomes occurred in cases where responders administered drugs. Positioning of patients in an upright position had the highest number (78.6%) of patients with mild injury outcomes at the time of disposition. The casualties positioned on their abdomen had the highest proportion (50%) of cases with severe injury outcomes at the time of disposition. Statistical tests indicate a significant ( $p<0.05$ ) association between helping with breathing, stopping bleeding, covering casualty for warmth, and positioning him during transportation as indicated in Table 2.

##### 3.1.3. Influence of on-transit actions

Table 3 presents on-transit action predictor factors on outcome of injuries in multivariate analysis. The study findings indicate that the casualties who were covered for warmth during transportation were more likely to end up in Moderate outcomes (OR 4.899 95% CI (1.126-21.311), 0.034). Those transported on their side were less likely to end up with severe injury outcomes (OR 95% CI, 0.016 (0.001-0.305), 0.006).

Table 2. On-transit actions

Table 2: On transit actions							
Study variables and values labels (n=427)	Outcome at disposition from the health facility			Total (N %)	$\chi^2$	df	p-value
	Mild (n %)	Moderate (n %)	Severe (n %)				
<b>On-transit care</b>							
<b>Accompaniment of the casualty</b>							
Yes	205 (67)	41 (13.4)	60 (19.6)	306(100)	5.131	2	0.08
No	94 (77.7)	13 (10.7)	14 (11.6)	121(100)			
<b>Helped with breathing</b>							
N/A	93 (77.5)	13 (10.8)	14 (11.7)	120 (100)	17.159	4	0.001*
Yes	14 (42.4)	6 (18.2)	13 (39.4)	33 (100)			
No	192 (70.1)	35 (12.8)	47 (17.2)	274 (100)			
<b>Stopped bleeding</b>							
N/A	93 (77.5)	13 (10.8)	14 (11.7)	120 (100)	10.846	4	0.030*
Yes	49 (57)	16 (18.6)	21 (24.4)	86 (100)			
No	157 (71)	25 (11.3)	39 (17.6)	221 (100)			
<b>Applied a splint</b>							
N/A	93 (77.5)	13 (10.8)	14 (11.7)	120 (100)	7.013	4	0.14
Yes	8 (53.3)	2 (13.3)	5 (33.3)	15 (100)			
No	198 (67.8)	39 (13.4)	55 (18.8)	292 (100)			
<b>Covered casualty for warmth</b>							
N/A	93 (77.5)	13 (10.8)	14 (11.7)	120 (100)	25.884	4	0.001*
Yes	45 (53.6)	23 (27.4)	16 (19)	84 (100)			
No	161 (72.2)	18 (8.1)	44 (19.7)	223 (100)			
<b>Positioning during transportation</b>							
N/A	85 (76.6)	13 (11.7)	13 (11.7)	111 (100)	57.829	8	0.001*
On the side	51 (56.7)	25 (27.8)	14 (15.6)	90 (100)			
On his/her abdomen	4 (50)	0 (0)	4 (50)	8 (100)			
Sitting upright	147 (78.6)	12 (6.4)	28 (15)	187 (100)			
Tied down on the back	12 (38.7)	4 (12.9)	15 (48.4)	31 (100)			
Total	299 (70)	54 (12.6)	74 (17.3)	427 (100)			

Note: \*significant  $p < 0.05$ 

Table 3. Influence of on-transit actions

Study variables	Variable labels	Outcome (OR 95% CI, p-value)		
		Mild	Moderate	Severe
Organized transport	Yes	1	0.612 (0.101-3.718), 0.594	1.083 (0.182-6.447), 0.93
	No	1	b	b
Helped with breathing	Yes	1	1.459 (0.026-82.574), 0.855	20.386 (0.749-554.777)
	No	1	b	b
Stopped bleeding	Yes	1	0.503 (0.087-2.914), 0.443	1.514 (0.344-6.662), 0.583
	No	1	b	b
Covered for warmth	Yes	1	4.899 (1.126-21.311), 0.034*	0.926 (0.221-3.871), 0.916
	No	1	b	b
Positioning during transportation	On side	1	1.405 (0.097-20.27), 0.803	0.016 (0.001-0.305), 0.006*
	On his/her abdomen	1	1.91E-09 (1.91E-09-1.91E-09)	0.129 (0.003-5.995), 0.296
	Sitting upright	1	0.649 (0.038-10.973), 0.764	0.03 (0.002-0.565), 0.019*
	Tied down on his/her back	1	b	b

Reference (Mild), b (parameter is set to zero)

### 3.2. Discussion

The current study shows that the most common mode of transportation to the health facility was other means other than an ambulance. Accompaniment of the casualty to the health facility was the most common kind of assistance provided by the first responders during transportation. The next important intervention by responders included arresting bleeding and covering the casualty for warmth.

These findings are in agreement with a survey conducted in 2015 to assess the pre-hospital experience of Tanzanian trauma patients which found that 35% of patients were transferred to the first health facility by a private vehicle but about 21% could not remember how they arrived at the first health facility. About 25% of the casualties thought that transportation in an ambulance was too expensive and hence beyond their reach. Another reason given for the low use of government ambulance is that the drivers extort bribes before providing service. However, this study was limited to a single urban centre with a small sample size of 34 patients [22]. Another study in the rural area of Tamil Nadu found that only 7.5% of the casualties were transferred to the hospital in an emergency ambulance while the rest (92.5%) either used other modes of transport or did not even attempt to access the hospital [23]. A prospective descriptive study conducted in 2014 to assess community-based perceptions of emergency care in Kenya found that the leading mode of transport evacuation was by private cars (31%). Evacuations by ambulances accounted for only 15% [24]. A

cross-sectional study conducted in 2013 in Tikur Anbesa Hospital in Ethiopia to assess the incidence of traffic related injuries and its associated factors found that slightly over a third (35.1%) of road traffic casualties used a minibus as a mode of transportation to the health facility. About 0.7% of the casualties used police vehicles to the hospital [25]. Study findings in a qualitative descriptive study carried out in Sudan between 2008 and 2014 indicate that the transportation of road traffic casualties is carried out by the government ambulances and by private or public transport [26].

Study findings in an assessment of emergency medical services in the Ashanti region of Ghana that applied a mixed methods approach indicate that no medical care was delivered during the informal pre-hospital transportation [27]. However, a cross-sectional study carried out to evaluate the pattern of road accidents system response and quality of services in emergency ward of Lok Nayak Hospital in Delhi found that 25.3% of persons inflicted with road traffic injuries received care while on transit to the health facility [28].

The above trends can be traced from lack of awareness on the existence of the government ambulance service and its importance. Probably accessibility of the ambulance services could be a barrier. Probably there is no universal communication mode to request for emergency ambulance services. Provision of care may be depended on knowledge and skills of the people involved in response. Governments should also provide transportation facilities to facilitate on-transit care. The transport vessels should be equipped and staffed as a moving ward ready to care for patients' on-transit for definitive care.

#### 4. CONCLUSION

This study sought to determine the association between on-transit actions with outcomes of traffic related injuries in Makueni County, Kenya. This study revealed that on-transit actions have influence on outcome of traffic related injuries. Covering casualty for warmth, helping with breathing and positioning of unconscious person during transportation are significantly ( $p < 0.05$ ) related with outcome of injuries. Study recommends training of the *bodaboda* (motorbike) riders and people living near the accident black spots on First-aid care. Health system strengthening in the Counties will ensure that the First Responders are able to provide appropriate treatment for most of the casualties in the continuum of care.

#### ACKNOWLEDGEMENTS

We are indebted to all whose contributions made it possible for me to accomplish this work. I appreciate the staff of Mount Kenya University for guiding me during the study. I also extend my appreciation to the Department of Health staff and all the Police commanders in Makueni County for their assistance. Lastly, we are grateful to the respondents and the community members living within various mapped black spots in Makueni, the Research Assistants and my peers for their information.




#### REFERENCES

- [1] WHO, "Post-crash response," in *Supporting Those Affected By Road Traffic Crashes*, 2016, p. 3. [Online]. Available: <https://www.who.int/publications/i/item/post-crash-response-supporting-those-affected-by-road-traffic-crashes>.
- [2] A. Sargazi *et al.*, "Economic burden of road traffic accidents; report from a single center from South Eastern Iran," *Bulletin of Emergency & Trauma*, vol. 4, no. 1, p. 43, Jan. 2016.
- [3] WHO, "Save Lives: A road safety technical package," p. 60, 2017. [Online]. Available: <https://www.who.int/publications/i/item/save-lives-a-road-safety-technical-package>.
- [4] WHO, "Global status report on road safety 2015 summary," 2015. [Online]. Available: <https://www.afro.who.int/publications/global-status-report-road-safety-2015>.
- [5] Global Road Safety Partnership, "Drinking and driving: a road safety manual for decision-makers and practitioners," *Alcohol World*, vol. 14, no. 1, pp. 1–149, 2007.
- [6] Ministry of Health; Kenyan National Bureau of Statistics; World Health Organization, "STEPwise Survey for Non Communicable Diseases Risk Factors 2015 Report," *Public Health*, vol. 5, no. 7, pp. 8–210, 2015.
- [7] Ministry of Health, "Kenya emergency medical care policy," 2018. [Online]. Available: <https://www.emergencymedicinenkenya.org/emcpolicy/>.
- [8] WHO, "Injuries and violence: The facts 2014," Geneva, 2014. [Online]. Available: <https://apps.who.int/iris/handle/10665/149798>.
- [9] V. Kureckova, V. Gabrhel, P. Zamecnik, P. Rezac, A. Zaoral, and J. Hobl, "First aid as an important traffic safety factor – evaluation of the experience-based training," *European Transport Research Review*, vol. 9, no. 1, pp. 1–8, Mar. 2017.
- [10] A. Chandrasekharan, A. J. Nanavati, S. Prabhakar, and S. Prabhakar, "Factors impacting mortality in the pre-hospital period after road traffic accidents in Urban India," *Trauma monthly*, vol. 21, no. 3, Jul. 2016, doi: 10.5812/TRAUMAMON.22456.
- [11] B. Menne *et al.*, "Health and well-being for all: an approach to accelerating progress to achieve the Sustainable Development Goals (SDGs) in countries in the WHO European Region," *Eur. J. Public Health*, vol. 30, no. Suppl\_1, pp. I3–I9, Mar. 2020.
- [12] ICSU, "Review of the Sustainable Development Goals," in *The science perspective*, 2015.
- [13] C. Staton *et al.*, "Road traffic injury prevention initiatives: a systematic review and metasummary of effectiveness in low and middle income countries," *PLoS ONE*, vol. 11, no. 1, Jan. 2016, doi: 10.1371/JOURNAL.PONE.0144971.
- [14] A. G. Kironji *et al.*, "Identifying barriers for out of hospital emergency care in low and low-middle income countries: a systematic review," *BMC Health Services Research*, vol. 18, no. 1, p. 291, 2018, doi: 10.1186/s12913-018-3091-0.




- [15] Gideon's International, *The Holy Bible*. National Publishing Company, 1978.
- [16] E. D. Minge, "Emergency medical services response to motor vehicle crashes in rural areas," *Emergency Medical Services Response to Motor Vehicle Crashes in Rural Areas*, Sep. 2013. [Online]. Available: <https://nap.nationalacademies.org/read/22503/chapter/1>.
- [17] A. Wambua Mathulu, S. Some, E. M. Ndonga, and A. W. Mathulu, "Association between Pre-Hospital Prioritization and Outcome of Injuries from Road Traffic Accidents in Makueni County, Kenya," *Trauma Cases and Reviews*, vol. 7, no. 2, p. 094, Nov. 2021, doi: 10.23937/2469-5777/1510095.
- [18] MOH, "Concept paper on the proposed ambulance services in Kenya: a vision 2030 healthcare strategy," Nairobi, Kenya, 2013.
- [19] A. A. Fisher, J. E. Laing John E Stoeckel, J. Townsend, J. E. Laing, and J. E. Stoeckel, "Handbook for family planning operations research design," *Reproductive Health*, Jan. 1991, doi: 10.31899/rh10.1039.
- [20] A. W. Mathulu and B. W. Mbithi, "Job Satisfaction among the Nurses of Makueni District Hospital, Kenya," *International Journal of Public Health Science (IJPHS)*, vol. 5, no. 4, pp. 450-457, Dec. 2016, doi: 10.11591/ijphs.v5i4.4850.
- [21] A. W. Mathulu and B. W. Mbithi, "Socio-cultural factors influencing uptake of skilled childbirth services among women in Kaiti Division, Makueni District (Kenya)," *International Journal of Public Health Science (IJPHS)*, vol. 6, no. 2, pp. 101-108, Jun. 2017, doi: 10.11591/ijphs.v6i2.6638.
- [22] S. R. Shrivastava, P. Pandian, and P. S. Shrivastava, "Pre-hospital care among victims of road traffic accident in a rural area of Tamil Nadu: A cross-sectional descriptive study," *Journal of Neurosciences in Rural Practice*, vol. 5, no. Suppl 1, pp. S33-S38, Aug. 2014, doi: 10.4103/0976-3147.145198.
- [23] K. Kuzma, A. G. eorg. Lim, B. Kepha, N. E. velyn. Nalitolola, and T. A. Reynolds, "The Tanzanian trauma patients' prehospital experience: a qualitative interview-based study," *BMJ Open*, vol. 5, no. 4, p. e006921, Apr. 2015, doi: 10.1136/BMJOPEN-2014-006921.
- [24] M. C. Broccoli, E. J. B. Calvillo, A. P. Skog, B. W. Wachira, and L. A. Wallis, "Community-based perceptions of emergency care in Kenya," *African Federation for Emergency Medicine (AFEM)*, pp. 1-32. 2015. [Online]. Available: [https://ecommons.aku.edu/eastafrica\\_fhs\\_mc\\_emerg\\_med/1](https://ecommons.aku.edu/eastafrica_fhs_mc_emerg_med/1).
- [25] B. T. Tiruneh, B. A. Dachew, and B. B. Biftu, "Incidence of road traffic injury and associated factors among patients visiting the emergency Department of Tikur Anbessa Specialized Teaching Hospital, Addis Ababa, Ethiopia," *Emergency Medicine International*, vol. 2014, 2014, doi: 10.1155/2014/439818.
- [26] S. C. Giri, G. Malla, R. Bhandari, M. Poudel, and S. Giri, "Transport and Pre-hospital care prior to arrival in tertiary care emergency department of eastern nepal: a cross sectional study," *Journal of BP Koirala Institute of Health Sciences*, vol. 2, no. 1, pp. 60-67, 2019, doi: 10.3126/jbpihs.v2i1.24971.
- [27] N. K. Mould-Millman *et al.*, "Assessment of emergency medical services in the ashanti region of Ghana," *Ghana Medical Journal*, vol. 49, no. 3, pp. 125-135, Sep. 2015, doi: 10.4314/GMJ.V49I3.1.
- [28] A. H. Woyessa, W. D. Heyi, N. H. Ture, and B. K. Moti, "Patterns of road traffic accident, nature of related injuries, and post-crash outcome determinants in western Ethiopia - a hospital based study," *African Journal of Emergency Medicine*, vol. 11, no. 1, p. 123, Mar. 2021, doi: 10.1016/J.AFJEM.2020.09.008.

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