PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	"Do deaths from road traffic injuries follow a classical trimodal pattern in North West Ethiopia? A hospital-based prospective cohort study."
AUTHORS	Denu, Zewditu; Yassin, Mensur; Azale, Telake; Biks, Gashaw; Gelaye, Kassahun

VERSION 1 – REVIEW

REVIEWER	Alharbi, Ravan	
	La Trobe University - Bundoora Campus	
REVIEW RETURNED	21-Apr-2021	
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GENERAL COMMENTS	 Thank you for this manuscript. I appreciate the hard work that you have done to bring the information out on trauma care in Ethiopia. I have the following comments/suggestions for you to enrich the manuscript for revision and resubmission. 1. Abstract – Results, please make the predictors clearer for the reader e.g., hospital arrival time and SBP on admission. Is it PM or AM? SBP < 90 mm Hg? 2. The last sentence of the abstract conclusion "The article has been registered with a unique identification number (UIN) of researchregistry6556" belongs to the method or as an additional subheading. Please correct the sentence typo error. 3. Abstract – conclusion, needs a robust conclusion. 4. Background – page 4, line 38 "It impacts more than 3% of gross domestic product for most countries" can you please give example? 5. Background – page 4, line 41, the estimated cost of RTI is higher than 1.5% of GPD in LMICs, the reference you have used is too old. Please use the latest WHO report on RTI. 6. Background – page 4, line 46, yes trauma system plays an important role, but it is oddly to say "mainly due to the poor "legalisation around road safely plays a major part of the RTI burden in LMICs. 7. Background – page 4, line 50, what is the RTC mortality rate per 100,000 population in Ethiopia? 8. Background – page 8, line 16, incomplete sentence "Victims discharged before one month or those treated at the outpatient department were." The rest of the method looks very good to me. 10. Results – page 16, line 27 and 28, as per the abstract feedback. 	

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Overall, this is a good study in terms of highlighting the availability of resources particularly prehospital care and predicting mortality among RTI patients. This study has the potential to be a great and much interesting paper in the literature of trauma care in Ethiopia
after amending it. Good luck.

REVIEWER	Tan Chor Lip, Henry Hospital Sultan Ismail
REVIEW RETURNED	22-Apr-2021

GENERAL COMMENTS	Congratulations to the author on tremendous effort on writing this manuscript. The concept of trimodal death is still relevant in most nations, even in high income nations. I have no major objections to this paper, however the results : 1/ trimodal deaths 2/ the identified predictors of deaths were well known predictor of deaths in many studies. 3/ Being a driver was identified as a significant predictor, but this may only be prevalent in certain populations where driving license or driving education and road traffic enforcement is poor. Probably a look up in the literatures would enhance this article. Otherwise the outcomes of this study is similar to most known studies and does not add further information.
	This paper requires extensive language editing/sentence resecturing prior publication - suggest for a native English reader for proof reading services

REVIEWER	Inamasu, Joji
	Fujita Health University Hospital, Neurosurgery
REVIEW RETURNED	04-May-2021

GENERAL COMMENTS 1. Reproputition of the second stress of the second str	agarding the victims with GCS<8 (i.e., severe head injury), the ortion was only 14% (64/454) (Table 6). Regarding the victims BP<89, the proportion was only 12% (53/454) (Table 6). Table 7), I cannot help wondering what had been the sport measure for those with severe head injury and/or those shock in the authors region. Is it possible that substantial ber of those might not have been transported to their ution because of lack of ambulance/EMS? Agarding the number of passengers/pedestrians, they were 232 in Table 2 and 234/168 in Table 6. Which was accurate? Table 7), the number of injured drivers is greater than the ber of injured passengers. Why in your country the number of ad passengers was much greater? Agarding the type of vehicle (Table 2), what does [Peoples' sport] mean? Agarding the injury pattern (P13), the proportion of thoraco- minal injury in their cohort was surprisingly low (7%), pared to figures reported from the other Continents. Please
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 5. Regarding prehospital care, the authors described that [none of the victims received pre-hospital care at the scene of injury] (P18L36). However, according to Table 3, 171 patients seem to have received prehospital care. It may not be correct to use the word [prehospital care] to those 171 patients who might have received some care in prior referring hospitals. 6. Regarding the number of head injury patients, the authors described that 113 (24.9%) had head injuries (P13L17). However, in P8L29-30, they described that [64 (14.1%) had a severe head injury, 18 (4%) had a moderate head injury and 372 (81.9%) had mild head injuries]. According to the latter sentence, the total number of head injury patients was 454. Which number was accurate? 7. In their institution, when CT scans were used for trauma patients? Were there any criteria for obtaining head and/or whole brain CT scan?
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VERSION 1 – AUTHOR RESPONSE

	Reviewer 1	
1.	Abstract – Results, please make the predictorsclearer for the reader e.g., hospital arrival timeand SBP on admission. Is it PM or AM? SBP <	On behalf of the authors, I would like to appreciate for your time and very valuable comments which will improve the manuscript.
		We accepted the comment and revised accordingly Systolic blood pressure was <90mmHG and the hospital arrival refers for the total time it took from injury to hospital arrival. Accordingly in our study mortality was significantly associated with hospital arrival time from one hour of injury up to 4 hours of injury.
2.	The last sentence of the abstract conclusion "The article has been registered with a unique identification number (UIN) of researchregistry6556" belongs to the method or as an additional subheading. Please correct the sentence typo error.	Thank you for the comment. We took to the method section.
3.	Abstract – conclusion, needs a robust conclusion.	Thank you for the comment, we revised the conclusion in the abstract
4.	Background – page 4, line 38 "It impacts more than 3% of gross domestic product for most countries" can you please give example?	Thank you for the comment, example was given as per the comment. (Page 3, lines 19-20).
5.	Background – page 4, line 41, the estimated cost of RTI is higher than 1.5% of GPD in LMICs, the reference you have used is too old. Please use the latest WHO report on RTI.	Thank you for the comment, the reference is replaced with WHO report 2015, (reference #7)
6.	Background – page 4, line 46, yes trauma system plays an important role, but it is oddly	Thank you for the insight full comment. We revised it as per the comment.

	to say "mainly due to the poor … "legalisation around road safely plays a major part of the RTI burden in LMICs.	(Page 3, lines 25-29)
7.	Background – page 4, line 50, what is the RTC mortality rate per 100,000 population in Ethiopia?	Thank you for the question. We added the mortality per 100,000 population in Ethiopia. (Page 5, lines 1-2)
8.	Background – page 5, line 44, please give an example for such countries with reference	Thank you for the comment. The previous studies we mentioned were studies conducted in Ethiopia. We put the references (reference #17&18), page 5, lines 5-6
9.	Method – page 8, line 16, incomplete sentence "Victims discharged before one month or those treated at the outpatient department were." The rest of the method looks very good to me	Thank you for the comment, we completed the sentence. (Page 7, lines 14-16)
10.	Results – page 16, line 27 and 28, as per the abstract feedback. Overall, this is a good study in terms of highlighting the availability of resources particularly prehospital care and predicting mortality among RTI patients. This study has the potential to be a great and much interesting paper in the literature of trauma care in Ethiopia after amending it. Good luck	Thank you for the comment, we revised as per the comment (Pages 15, lines 18-25)
1.	Congratulations to the author on tremendous effort on writing this manuscript. The concept of trimodal death is still relevant in most nations, even in high income nations. I have no major objections to this paper, however the results: 1/ trimodal deaths 2/ the identified predictors of deaths were well known predictor of deaths in many studies. 3/ Being a driver was identified as a significant predictor, but this may only be prevalent in certain populations where driving license or driving education and road traffic enforcement is poor. Probably a look up in the literatures would enhance this article. Otherwise the outcomes of this study is similar to most known studies and does not add further information.	Thank you for the comment. As you said the findings are similar with previous findings, but it is not similar with findings of current studies. The trimodal patter of death following trauma is a concept before 3 decades and we are still there. In many countries with matured trauma system the concept of trimodal pattern of death is being changed due to significant decrease in early and late deaths. In many situation deaths following any trauma in countries with advanced trauma centers are those with non- survivable injuries, but our finding showed that there were late deaths from infection and organ failure, implying poor management at the hospital. Ethiopia is a country with no emergency medical system and in the study setting there is no separate trauma center. There is also no surgical ICU. Majority of deaths occur out of hospital. Despite the high prevalence of trauma from road traffic, violence and other causes, little attention had been paid by the government. - With regard to drivers, in our case injured drivers are less in number, but the injury severity was higher among drivers. This

		may be due to risky driving Behaviour such as failure to comply with safety measures. From previous study it was found that 57.5% of drivers unfasten their seat belt while driving (<i>Hassen et al; 2011</i>), hence when sudden stop encountered they are more likely to have CNS and thoracic injuries leading to death.
	Reviewer #3	
11.	1. Regarding the victims with GCS<8 (i.e., severe head injury), the proportion was only 14% (64/454) (Table 6). Regarding the victims with BP<89, the proportion was only 12% (53/454) (Table 6). Those figures indicate that the proportion of victims with severe head injury and/or those with shock transported to the institution of the authors was fairly small. Considering that more than 80% of victims had been brought by family or relatives of the victim, not by ambulance (Table 3), I cannot help wondering what had been the transport measure for those with severe head injury and/or those with shock in the authors region. Is it possible that substantial number of those might not have been	Thank you for the insight full comment. As you said majority of the victims were brought by their family and by commercial vehicles. This is mainly due to absence of an integrated system that can respond to trauma in the community. Trauma victims have to come to the health care facilities, no system that can respond in the community. As we put under the limitation section, our study didn't include deaths before hospital arrival, otherwise the number of deaths could have been much higher than the current finding. Besides; though there are ambulance in the country their primary purpose is to transport pregnant mothers. Ambulance is rarely used to transport Trauma victims from one health care system to other
12.	Regarding the number of passengers/pedestrians, they were 168/232 in Table 2 and 234/168 in Table 6. Which was accurate? In most countries, the number of injured drivers is greater than the number of injured passengers. Why in your country the number of injured passengers was much greater?	Thank you for the comment and sorry for the typing error. It was table 2 which is correct. Regarding the question why the number of injured passengers was greater than that of drivers? In high income countries most vehicles are privately owned where the driver is the car occupant being injured. In our case majority of drivers are hired and drive commercial vehicles of 40-60 seat, hence when accident occur such number of passengers could be injured.
13.	Regarding the type of vehicle (Table 2), what does [Peoples' transport] mean?	Thank you for the question. People transport are mostly commercial vehicles of different seats that are used to transport people from place to place. They include buses, mini buses, taxies
14.	Regarding the injury pattern (P13), the proportion of thoraco-abdominal injury in their cohort was surprisingly low (7%), compared to figures reported from the other Continents. Please explain why.	Thank you for the question, yes you are right thoraco-abdominal injuries are underrepresented in our study. As we mentioned under the limitation section, out of hospital deaths were excluded

15.	Regarding prehospital care, the authors described that [none of the victims received pre-hospital care at the scene of injury] (P18L36). However, according to Table 3, 171 patients seem to have received prehospital care. It may not be correct to use the word [prehospital care] to those 171 patients who might have received some care in prior referring hospitals.	from the current study and we guess those severe injuries like thoraco- abdominal injuries are more likely to cause immediate deaths before hospital arrival and they were under represented in our study. Thank you for the insight full comment. As you stated it was not right to say pre- hospital care for those 171 cases who got some type of care at primary hospitals and health centers before coming to the study hospital. We revised as per the comment. (Page 12, table 3)
16.	Regarding the number of head injury patients, the authors described that 113 (24.9%) had head injuries (P13L17). However, in P8L29-30, they described that [64 (14.1%) had a severe head injury, 18 (4%) had a moderate head injury and 372 (81.9%) had mild head injuries]. According to the latter sentence, the total number of head injury patients was 454. Which number was accurate?	Thank you for the comment, sorry the 372 was to say no head injury, not mild head injury. Accepted and corrected. (Page 12, line 13)
17.	In their institution, when CT scans were used for trauma patients? Were there any criteria for obtaining head and/or whole brain CT scan?	Thank you for the insight full question. We basically do CT Scan for trauma patients when there is a clear indication by mechanism of injury, patient condition or abnormal preliminary imaging results. Thus, patients with high speed motor injuries, polytrauma, abnormal vital signs and abnormal FAST, chest or pelvic x-ray have CT scan done.
		The protocol for obtaining brain/head CT as a diagnostic investigation is for every head injury patient with GCS of 14 or below. Patients with low risk factors for intracranial injuries (GCS of 15/15, asymptotic or with only mild symptoms like headache, dizziness or only scalp lesion like abrasion, laceration or skin contusion) are observed without having CT scan.
		Follow up brain CT is done according to the patient condition. We do it for deteriorating patients after intervention with new developments like Seizures, focal deficits while on treatment.

	1.

VERSION 2 – REVIEW

REVIEWER	Alharbi, Rayan
	La Trobe University - Bundoora Campus
REVIEW RETURNED	08-Jul-2021
GENERAL COMMENTS	I am happy with the improvements to the article made by the authors.
REVIEWER	Inamasu, Joji
	Fujita Health University Hospital, Neurosurgery
REVIEW RETURNED	21lul-2021
GENERAL COMMENTS	 The authors provided data on educational status and occupational status (Table 2). They described that 144 (31.7%), were unable to read and write. What does this mean? Illiterate people are more likely to suffer from traffic injury in Ethiopia? Or, this simply a reflection of high illiterate rate in Ethiopia? Please provide your thought about it. In most developed countries, the great majority of traffic accident victims are men, not women. This is in sharp contrast with your data. Please explain why in your country, women are far more likely be involved in traffic accidents. Regarding transport to hospital, 93 patients were brought to hospital by ambulance (Table 3). The figure differed substantially from the data on [Who brought the victims to the hospital] (Table 3). Please explain. Regarding the including criteria, the author described that comatose patients were excluded (Eligibility criteria). However, looking at Table 6, 64 patients had GCS <8 (comatose). Those seem to be contradictory. Road user category and Type of vehicle did not match (Table 2). In Road user category more than 50% of victims were
	2). In Road user category, more than 50% of victims were
	pedestrians. In Type of vehicle category, there were many vehicle types. How they are relevant?

VERSION 2 – AUTHOR RESPONSE

Reviewer 3	
The authors provided data	Thank you for your comment, this is an important question, but it really
on educational status and	needs further study to explain why such high numbers of victims were
occupational status (Table	unable to read and write. In fact those who are educated can be more
2). They described that 144	aware about traffic safety measures. From previous study in the region
(31.7%), were unable to	similar finding was reported showing 58.3% of RTI victims were unable

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	read and write. What does this mean? Illiterate people are more likely to suffer from traffic injury in Ethiopia? Or, this simply a reflection of high illiterate rate in Ethiopia? Please provide your thought about it.	to read and write out of 200 victims (https://www.iiste.org/Journals/index.php/RHSS/article/view/37246/382 87). The low literacy rate can also explain the finding. According to the UNESCO Institute for Statistics 2020, the literacy rate in Ethiopia is 51.77% with annual change of 12.78%(worldbank.org/indicator/SE.ADT.LITR.ZS?locations=ET). But further study is crucial to attribute the finding to either low literacy rate or high RTI incidence among the illiterate.
2	In most developed countries, the great majority of traffic accident victims are men, not women. This is in sharp contrast with your data. Please explain why in your country, women are far more likely be involved in traffic accidents.	Thank you for your critical review and insight full comment. Sorry for the error, as we described in the main text (line 244), 72% of our participants were men, not women, it was typing error on table 2, that we have exchanged the value for men with women, apology, we corrected it.
3	Regarding transport to hospital, 93 patients were brought to hospital by ambulance (Table 3). The figure differed substantially from the data on [Who brought the victims to the hospital] (Table 3). Please explain.	Thank you for your valuable comment. As you stated, majority of the victims were brought by their relative/family (82.6%). From this 93(20.5%) were brought by ambulance. The reason for this is, though there is ambulance it often serves only for transportation, there is no ambulance crew to accompany the patient. Therefore, though there is ambulance, patients are brought by their family, not by the ambulance crew. When there is no family, the police men are responsible to accompany the victims in the context of the study area. To make this clearer, there is no out of hospital emergency response, and ambulances are used for inter-hospital patient transfer (From primary hospitals to the referral hospital).
4	Regarding the including criteria, the author described that comatose patients were excluded (Eligibility criteria). However, looking at Table 6, 64 patients had GCS <8 (comatose). Those seem to be contradictory.	Thank you for your insightful comment. As you stated we excluded comatose patients, but not all comatose patients. We excluded comatose patients who have no attendants, because if the victim is comatose, and there is no attendant with him/her there is no way to know all the pre injury variables, the time of injury and related factors (Line 157).
5	Road user category and Type of vehicle did not match (Table 2). In Road user category, more than 50% of victims were pedestrians. In Type of vehicle category, there were many vehicle types. How they are relevant?	Thank you for the comment. As you stated, more than 50% of our participants were pedestrians. Different vehicle types were involved in all the road user category injuries. For instance from the total of 232 pedestrian injuries, 31 were injured by heavy truck, 102 by people's transport, 5 by carts, 91 by three wheel vehicles and 2 by vehicles under others category. As can be seen from the data more than 80% of pedestrian injuries were committed by people's transport and three wheel vehicles. Minibuses which are categorized under people's transport and the three wheel vehicles serve in towns and on the inter-urban roads where there is high people movement. The absence of separate road way for pedestrians in most areas of the study area, coupled with the poor compliance of the people in the area for safety measures could explain this finding.

VERSION 3 – REVIEW

REVIEWER	Inamasu, Joji Fujita Health University Hospital, Neurosurgery
REVIEW RETURNED	20-Sep-2021
GENERAL COMMENTS	The revised manuscript may be acceptable for publication (while not all of the queries were addressed by the authors).