

# Poor technical condition of vehicles in developing countries as a health hazard for citizens of Ghana

Katarzyna Wojtysiak<sup>1</sup>, Ewa Zieliński<sup>2</sup>, Tomasz Wojsz<sup>3</sup>

<sup>1</sup>Department of Social and Medical Sciences, Faculty of Health Sciences  
Collegium Medicum in Bydgoszcz of the Nicolaus Copernicus University in Toruń, Poland.

<sup>2</sup>Department of Emergency Medicine, Faculty of Health Sciences  
Collegium Medicum in Bydgoszcz of the Nicolaus Copernicus University in Toruń, Poland.

<sup>3</sup>Student, University of Białystok, Poland.

Email: \*katarzyna.sas@hotmail.pl

Orcid:0000-0003-0604-0196(KatarzynaWojtysiak)

## SUMMARY

**Purpose:** This is a review to assess the technical condition of vehicles in developing countries and its impact on health hazard on the example of Ghana. In developing countries, due to the globalization process, the number of vehicles involved in road traffic is systematically increasing. The health consequences of road accidents are important public concern.

**Methodology:** The PubMed and Google scholar search were used to find literature in order to analyze the purpose of the paper. The following keywords were used to search for information sources: health hazards, technical condition, vehicles, accidents, developing countries, Ghana. The analysis has been done by the systematic review analysis method. The articles were selected in terms of the impact of poor technical condition of vehicles in Ghana and its effects on the road safety in this area. 20 articles were being reviewed.

**Main findings:** The quality of vehicles on Ghanaian roads is low. Most of the vehicles are old. For economic reasons, users often use substandard products to repair vehicles. Poor-quality, non-original, mismatched parts can lead to an accident. The technical condition of vehicles affects the safety of road users. The security of citizens should be an important goal of the state. Drivers and owners of transport companies should be strongly educated about the role of the technical condition of the vehicle. It is also important to emphasize about seat belts role in ensuring the safety of vehicle passengers. Inspections of the technical condition of vehicles, especially in public transport, should be strengthened and the frequency increased.

**Limitations:** In developing countries, not all road accidents are reported, so accident statistics may be understated and reports and statistics are not kept regularly. The article is based only on published reports and literature data.

**Implications:** Based on the analysis of the publications, it was assessed that there is no current literature on technical problems of vehicles in Ghana and its impact on road safety, with particular emphasis on public transport. This is an important topic for the security of citizens and should be investigated, analyzed and lessons learned without delay.

**Keywords:** health hazards, technical condition, vehicles, accidents, developing countries, Ghana

## INTRODUCTION

In developing countries, due to the globalization process, the number of vehicles involved in road traffic is systematically increasing. According to the International Organization of Motor Vehicle Manufacturers, 890,000 vehicles were registered in Ghana in 2015 and this number has been growing since 2010<sup>1</sup>. However, the technical condition of the vehicles is not satisfactory. The situation is particularly worrying on this continent due to a combination of poor vehicle condition, underdeveloped road infrastructure, a lack of risk awareness among road users and ineffective enforcement due to corruption or bribery<sup>2</sup>. Mainly used vehicles imported from developing countries are in road traffic, especially in the villages and poor areas of the cities. Ackaah estimates that in 2005-2007 only 9% of vehicles were in good technical condition<sup>3</sup>. The technical condition of vehicles affects the safety of road users. It can be observed that with the start of the globalization process, Ghana gradually enters the second phase of the epidemiological transformation, which means a gradual reduction in the percentage of victims of infectious diseases in favor of the percentage of accident victims in the total mortality. As the number of vehicles increases, the percentage of road accidents and road accident victims also increases in this country. Mock's research indicates that transport-related injuries were more severe than other types of injuries in terms of mortality, length of disability and economic consequences<sup>4</sup>.

**PURPOSE OF THE RESEARCH**

This is a review to assess the technical condition of vehicles in developing countries and its impact on health hazard on the example of Ghana.

**METHODOLOGY**

The PubMed and Google scholar search were used to find literature in order to analyze the purpose of the paper. The following keywords were used to search for information sources: health hazards, technical condition, vehicles, accidents, developing countries, Ghana. Articles were selected according to the technical condition of vehicles in developing countries and health hazards in developing countries on the example of Ghana. The analysis has been done by the systematic review analysis method. The articles were selected in terms of the impact of poor technical condition of vehicles in Ghana and its effects on the road safety in this area. 20 articles were being reviewed.

**REVIEW ANALYSIS / DISCUSSION****VEHICLES CONDITION IN GHANA**

Due to the increasing number of vehicles in Ghana, their technical condition is an increasingly important problem. This problem does not only concern private vehicles, the technical condition of public transport vehicles is also worrying. Both the trotro, i.e. private minibuses that run on fixed routes departing when full, and local taxis have visible features that threaten public safety. The most common causes of accidents resulting from technical faults are damaged lighting, malfunctioning braking system, inadequate tires, problems with the steering system and other damage requiring repair<sup>5</sup>. The quality of vehicles on West African roads is low. For economic reasons, users often use substandard products. Poor-quality, non-original, mismatched parts can lead to an accident. Factors that may contribute to an accident in African countries include: brake failure, tire burst, engine failure, defective and blinding lights or the use of counterfeit spare parts<sup>6</sup>.

In the context of the handover of used vehicles, there are links between Europe and Africa. As part of development and humanitarian aid, used cars are delivered to the African market, where they often function in a changed role for years. An example is the transformation of a German ambulance into a Ghanaian Trotro vehicle for public transport<sup>7</sup>. The technical condition of vehicles in Ghana is questionable. It can be observed that there are heavily corroded vehicles on the roads, with unprotected, visible cracks in the windows, inoperative lights or large holes in the chassis. Often you can see doors that are not closing properly, which are tied to ensure the safety of passengers. These problems are visible. Alhassan research shows that using old cars increases the risk of an accident. For each year, the risk of accident grows by 23.6%<sup>8</sup>.

In developing countries, vehicles are kept in poor condition due to financial reasons, lack of awareness and lack of appropriate competences among road safety control workers<sup>9</sup>. In particular, in rural areas and in poorer parts of cities, it can be observed that repairs are made only if they are necessary due to the impossibility of fulfilling the basic role of the vehicle. The best example is a tyre. Drivers do not change them until holes appear. Unfortunately, the Edunyh study found that there are four main causes of tire failure: excessive and under-inflation, excessive wear and overload of vehicles. More than 89% of drivers are unaware of tire safety measurements, especially the legal requirement for a minimum tire tread depth in force in Ghana<sup>10</sup>. For every 1 mm decrease in the tyre's tread depth, the accident probability increases by about 40%. Not all road users take a responsible approach to ensuring road safety, and it should be remembered that the road user is responsible not only for his own safety, but also for the safety of other users. Technical inspection at a vehicle inspection station serves both as a control and disciplines the user to make the necessary repairs, therefore the implementation of the obligation to perform periodic technical inspections would affect the elimination of inoperative vehicles from road traffic and increase the safety of users<sup>11</sup>. Delays in carrying out the necessary repairs or changes endanger the safety of users, therefore special attention should be paid to the inspection of vehicles, in particular vehicles carrying passengers in public transport.

**ROAD SAFETY IN PUBLIC TRANSPORT**

In countries like Ghana due to financial factors private vehicle ownership is very rare and people from villages mostly use public transport as a mean of transportation<sup>12</sup>. In developed countries, most public transport is provided by public institutions. However, in developing countries, transport is mostly provided by private companies which work under highly competitive but poorly regulated conditions what can risk safety of the passengers<sup>13</sup>.

What is more, in the North of Ghana motorised three-wheel vehicles are the third most frequently used mode of transport, especially for people with low and middle income. This mode of transport users is less protected in case of the traffic crash<sup>14</sup>. This is especially important to keep these vehicles in good condition and use helmet while driving. Also using a seat belt reduces risk of serious injury or death during an accident. Ghana has mandatory seat belt laws however not many of the users respect it<sup>15</sup>. According to Ojo 53.1% of drivers did not use the seat belt<sup>16</sup>. In local transport most of the trotros operating in the urban area does not provide possibility

to use seat belt for each user what pose a risk for passengers in case of sudden raking or accident.

#### HEALTH HAZARDS RESULTED FROM POOR TECHNICAL CONDITION

Although noncommunicable diseases are still the leading causes of death outside the hospital, most of the deaths are due to road traffic accidents and this numbers are systematically increasing<sup>17</sup>. Research indicates that road traffic accidents caused 16% of injuries in urban areas and 10% of injuries in rural areas<sup>4</sup>. Ametefe indicates that 70.3% of spinal injuries at Korle Bu Teaching Hospital are caused by road accidents, especially in the group of young men<sup>18</sup>. Spinal injuries are the most dangerous consequences of road accidents affecting not only patient survival, but also significantly reducing the survivor's quality of life after the accident. Unfortunately, no statistics are available about other health consequences of road accidents in this region.

Ackaah points out that excessive vehicle speed, inadequate adaptation of vans to transport people in trotros, overloading and the lack of a properly functioning emergency medical care system are the main causes of high road death rates<sup>3</sup>. Mock's research shows that a significant proportion of accidents involve public transport, 40% of accidents involve buses and 24% of taxis<sup>19</sup>. It shows that road safety depends also on public transport. It is important to note that the age and condition of vehicle is one of the most important factors of survival on the road, drivers whose vehicles aged over 10 years had lower survival chances than those with vehicles less than 10 years<sup>8</sup>. It is interesting that the risk of death in traffic accident at night is 1.3 times higher than during the daytime<sup>20</sup>. It can be affected not only by poor visibility of other road users but also by poor quality of car lights. That is why the vehicles should be well maintained and their condition should be frequently controlled by authorities. As accidents risk the life of road users all effort should be made to reduce their number and thus increase the safety of users.

#### Limitations

In developing countries, not all road accidents are reported, so accident statistics may be understated and reports and statistics are not kept regularly. The article is based only on published reports and literature data.

#### Implications

Based on the analysis of the publications, it was assessed that there is no current literature on technical problems of vehicles in Ghana and its impact on road safety, with particular emphasis on public transport. This is an important topic for the security of citizens and should be investigated, analyzed and lessons learned without delay.

#### CONCLUSIONS

The security of citizens should be an important goal of the state. Drivers and owners of transport companies should be strongly educated about the role of the technical condition of the vehicle. It is also important to emphasize about seat belts role in ensuring the safety of vehicle passengers. Inspections of the technical condition of vehicles, especially in public transport, should be strengthened and the frequency increased. Sanctions for the poor technical condition of the vehicle should be strongly enforced in order to increase the safety of Ghanaian citizens.

#### CONTRIBUTION

Paper conception and design: K. Wojtysiak (33,33%), T. Wojsz (33,33%), E. Zieliński (33,33%)

Data collection: K. Wojtysiak (33,33%), T. Wojsz (33,33%), E. Zieliński (33,33%)

Manuscript preparation: K. Wojtysiak (33,33%), T. Wojsz (33,33%), E. Zieliński (33,33%)

All authors reviewed the results and approved the final version of the manuscript.

#### DISCLOSURE

The authors report no conflicts of interest in this work.

#### REFERENCES

1. CEIC data website: <https://www.ceicdata.com/en/indicator/ghana/motor-vehicle-registered> [access: 05.07.2021].
2. Lagarde E. Road traffic injury is an escalating burden in Africa and deserves proportionate research efforts. Vol. 4, PLoS Medicine. 2007.
3. Ackaah W, Adonteng DO. Analysis of fatal road traffic crashes in Ghana. Vol. 18, International Journal of Injury Control and Safety Promotion. 2011.
4. Mock CN, Forjuoh SN, Rivara FP. Epidemiology of transport-related injuries in Ghana. Accident Analysis and Prevention. 1999;31(4).
5. Wojtas A, Szkoda M. Analysis of selected factors influencing safety in road transport. AUTOBUSY – Technika, Eksploatacja, Systemy Transportowe. 2018;19(6).
6. Oluwaseyi Joseph Afolabi, T GbadamosiKolawole. Road Traffic Crashes in Nigeria: Causes and Consequences. International Journal of Shipping and Transport Logistics. 2017;17(42).

7. Beisel U, Schneider T. Provincialising waste: The transformation of ambulance car 7/83-2 to trotroDr.Jesus. *Environment and Planning D: Society and Space*. 2012;30(4).
8. Alhassan F, Mamadou LD, Katara S. Survival modeling of accident risks of vehicle drivers in Northern Region of Ghana. *Scientific Research and Essays*. 2018;13(4).
9. Eke N. Road traffic accidents in the developing world: Who are liable? *Anil Aggrawal's Internet Journal of Forensic Medicine and Toxicology*. 2001;2(1).
10. Edunyah I. Causes of Tyre failure on Road Traffic Accident; A case study of Takoradi Township. *International Journal of Scientific and Research Publications*. 2016;6(2).
11. Pałubicki S, Czapiewski W. Wpływ okresowych badań technicznych na bezpieczeństwo ruchu drogowego [The impact of cyclictchnicalresearch on roadsafety]. *Autobusy: technika, eksploatacja, systemy transportowe* [Buses: technology, operation, transport systems]. 2017;18:87–92.
12. Afukaar F, Damsere-Derry J, Peters K, Starkey P. Rural Transport Services Indicators: Using a new mixed-methods methodology to inform policy in Ghana. *Transportation Research Interdisciplinary Perspectives*. 2019;3.
13. Agyeman W. Measurement of service quality of “Trotro” as public transportation in Ghana: A case study of the city of Kumasi. In: 32nd Southern African Transport Conference (SATC 2013). 2013.
14. Wahab L, Salifu M. Operational and Safety Assessment of Motorised Three-Wheel Vehicles for Public Transport in the Tamale Metropolis. *International Journal of Technology and Management Research*. 2020;2(1).
15. Teye-Kwadjo E, Salia S, Mensah GO, Ofori R. Exploring Ghanaian commercial drivers' intentions to wear a seat belt. *Case Studies on Transport Policy*. 2020;8(2).
16. Ojo TK. Seat belt and child restraint use in a developing country metropolitan city. *Accident Analysis and Prevention*. 2018;113.
17. Akakpo PK, Imbeah EG, Agyarko-Wiredu F, Awlavi K, Baah-Amoh K, Derkyi-Kwarteng L. Community Causes of Death in the Central Region of Ghana, the Missing Piece in Mortality Data. *Advances in Public Health*. 2020;2020.
18. Ametefe MK, Bankah PE, Yankey KP, Akoto H, Janney D, Dakurah TK. Spinal cord and spine trauma in a large teaching hospital in Ghana. *Spinal Cord*. 2016;54(12).
19. Mock C, Amegashie J, Darteh K. Role of commercial drivers in motor vehicle related injuries in Ghana. *Injury Prevention*. 1999;5(4).
20. Ackaah W, Apuseyine BA, Afukaar FK. Road traffic crashes at night-time: characteristics and risk factors. *International Journal of Injury Control and Safety Promotion*. 2020;27(3).