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# Explaining Risk Factors for Pedestrian fatalities in Tanzania using a Mixed-Effects Logit Regression Analysis

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## Background

Road traffic injuries remain a major public health concern in Tanzania. The World Health Organization estimated that in 2021 more than 10,000 people died due to road traffic crashes in Tanzania, with pedestrians accounting for approximately 26% of all fatalities. This highlights the need for context-specific analyses to identify factors associated with fatal pedestrian outcomes and to inform evidence-based prevention strategies.

## Aim

To quantify the effects of roadway, vehicle, environmental, and pedestrian characteristics on the risk of fatal pedestrian road traffic injuries in Tanzania, and to generate evidence to inform targeted, context-specific pedestrian safety interventions and road safety policy.

## Method

We analysed national pedestrian crash data from 2015 to 2017 using standard logistic regression and mixed-effects logistic regression models to account for clustering. The outcome of interest was fatal versus non-fatal pedestrian injury. Explanatory variables included roadway characteristics, vehicle type, traffic control, environmental conditions, and pedestrian demographic factors.

## Results

Several factors were significantly associated with increased odds of fatal pedestrian injury. These included crossing at junctions, collisions involving trucks or buses, walking on trunk/regional or rural roads, unpaved road surfaces, the absence of traffic control or reliance on sign-controlled intersections, and nighttime conditions. Pedestrians aged under 17 years and 35 years or older, as well as males, had higher odds of fatal outcomes compared with other groups

## Conclusions

Fatal pedestrian injuries in Tanzania are strongly influenced by road environment, vehicle mix, traffic control, time of travel, and pedestrian demographic characteristics. The findings indicate priority areas for intervention, including:

- (i) provision of safe mid-block crossing facilities and pedestrian refuges.
- (ii) improved street lighting and reflective visibility measures for nighttime safety;
- (iii) strengthened speed management and traffic calming on trunk, regional, and rural roads;
- (iv) enhanced protection from heavy vehicles through the separation of pedestrian and freight traffic in high-risk corridors; and
- (v) targeted road safety education and enforcement focusing on children, older adults, and high-risk road environments.

These results support the development of context-specific, data-driven pedestrian safety strategies in Tanzania and similar low- and middle-income country settings.