Cyclist–motorist crash patterns in Denmark: A latent class clustering approach

Objective: The current study aimed at uncovering patterns of cyclist–motorist crashes in Denmark and investigating their prevalence and severity. The importance of implementing clustering techniques for providing a holistic overview of vulnerable road users' crash patterns derives from the need to prioritize safety issues and to devise efficient preventive measures.

Method: The current study focused on cyclist–motorist crashes that occurred in Denmark during the period between 2007 and 2011. To uncover crash patterns, the current analysis applied latent class clustering, an unsupervised probabilistic clustering approach that relies on the statistical concept of likelihood and allows partial overlap across clusters.

Results: The analysis yielded 13 distinguishable cyclist–motorist latent classes. Specific crash patterns for urban and rural areas were revealed. Prevalent features that allowed differentiating the latent classes were speed limit, infrastructure type, road surface conditions, number of lanes, motorized vehicle precrash maneuvers, the availability of a cycle lane, cyclist intoxication, and helmet wearing behavior. After the latent class clustering, the distribution of cyclists’ injury severity within each cluster was analyzed.

Conclusions: The latent class clustering approach provided a comprehensive and clear map of cyclist–motorist crash patterns. The results are useful for prioritizing and resolving safety issues in urban areas, where there is a significant share of cyclists potentially involved in multiple hazardous situations or where extensive bicycle sharing programs are planned.

General information
Publication status: Published
Organisations: Administration, Department of Transport, Traffic modelling and planning
Contributors: Kaplan, S., Prato, C. G.
Pages: 725–733
Publication date: 2013
Peer-reviewed: Yes

Publication information
Journal: Traffic Injury Prevention
Volume: 14
Issue number: 7
ISSN (Print): 1538-9588
Ratings:
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 1.53 SJR 0.781 SNIP 1.117
Web of Science (2013): Impact factor 1.286
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
Original language: English
Keywords: bicycle crashes, cyclist–motorist crashes, cyclists’ injury severity, latent class clustering
DOIs:
10.1080/15389588.2012.759654
Source: dtu
Source-ID: u::8378
Research output: Contribution to journal › Journal article – Annual report year: 2013 › Research › peer-review