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.