



Variability in the impact of factors influencing elderly pedestrian-injuries in crashes at intersections and non-intersections before, during, and after the COVID-19 pandemic

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Elderly pedestrians aged 65 and above, due to their increased vulnerability, are among the most at-risk groups on the roads. Recognizing their susceptibility to accidents, researchers have delved into understanding the factors influencing the severity of injuries sustained by elderly pedestrians in traffic incidents. Prior studies have underscored differences in the factors impacting injury severity at intersections versus non-intersection sites, suggesting potential biases when using uniform models for estimation at both locations. Yet, there remains a gap in exploring how these factors affect injury severity outcomes for elderly pedestrians across varied locations and timeframes, including the pre, during, and post-COVID-19 pandemic periods. This study seeks to fill this void by analyzing crash data from Seoul spanning 2018 to 2022. Employing a random parameters logit model with a heterogeneity in means approach, it examines the temporal stability of factors linked to fatal or severe injuries among elderly pedestrians at both intersections and non-intersections across different pandemic phases. Preliminary analysis revealed fluctuating impacts of factors on injury severity outcomes, emphasizing the necessity of estimating individual models for various road segments and timeframes. Results from the estimated models suggest that head injuries, along with autumn and summer seasons, and dry pavement conditions are associated with fatal or severe injury outcomes. Notably, back injuries exhibit opposing associations at non-intersections and intersections. Moreover, certain indicators like morning peak hours, older drivers aged over 79 years, and traffic signal violations display significant variability in their impact across different road segments and years, possibly influenced by mobility changes stemming from the COVID-19 pandemic. Overall, the study underscores the diversity of determinants affecting fatal or severe injury outcomes among elderly pedestrians across different road segments and years. While the underlying cause of this variability remains unclear, considering heterogeneity in random parameter means enhances model accuracy and provides valuable insights for safety professionals. These findings carry significant implications for elderly pedestrian safety, particularly in scenarios where precise forecasts of alternative safety measures are crucial. Road safety experts can leverage these insights to refine existing policies aimed at bolstering elderly pedestrian safety, both at intersections and non-intersections.

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