Abstract

Road Traffic Injury (RTI) is recognized as a public health problem. RTI claim more than 1.3 million lives each year across the globe. In India, road crashes led to the death of 150,785 persons during the year 2016. Therefore, it is vital to analyze crashes, determine risk factors, and devise methods to mitigate the likelihood of a crash event and estimate the effectiveness of each improvement on highways. This study aims to develop the crash modification factors of the selected geometric interventions on National Highways in India using the case-control method. First, objective is to identify the most common crash pattern on the geometric elements of the National Highways segments. Second objective is to evaluate the safety effectiveness of selected geometric changes (shoulder width and median design) on highways using the case-control method.

Introduction

As per the government official data, 150,785 persons were killed and 494,624 injured in road traffic crashes in India in 2016, despite low vehicle ownership. RTI are the 8th leading cause of death in India in the year 2016. RTI are imposing huge economic loss to the country. National highways constitute only 1.8% of the total length of roads network in India but account for 35% of the fatalities. The fatality rate per km of the road is the highest on NH with 0.67 deaths per km annually.

Methodology

A matched case-control method will be used. Matched case-control method takes well care of confounding variables. Matching will be accomplished during the purposeful selection of controls. It provides an automatic adjustment of the relationship between the risk factor and outcome. Controls are matched to each case at a one-to-one ratio and matching is completed on several factors to account for potential confounding. Figure 5 illustrates the methodology of the matched case-control study design.

Conclusions

• Epidemiological methods in road safety domain have shown hope to the researchers of developing countries where data quality and others constraints hamper the research as well as its outcome.
• Case-control designs are well suited to investigate the effects of specific risk factors while controlling for other variables that may influence the outcome in question.
• The Case-control method is one of the promising solution to address confounders variable problem.

Industrial Significance

• Outcome of this study will be helpful to the agencies responsible for designing and construction for highways.
• Database framework will be developed, which will be useful for the agencies responsible for crash data collection and management.
• Proposed alternative approach will be useful for engineers and decision-makers to determine the relative effectiveness of geometric improvements.

References