Long-Term Effect of Universal Helmet Law Changes on Motorcyclist Fatal Crashes Comparison Group and Empirical Bayes Approaches

Abstract

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A motorcyclist helmet is considered important safety equipment because it prevents or minimizes head and brain injuries, which are often fatal. Hence, in the 1960s and 1970s, most of the states in the United States enacted the universal helmet law (UHL) requiring all motorcyclists to wear helmets. Many researchers have examined the effect of the helmet law changes by using before-and-after studies and found that repealing the law had a negative effect on motorcyclists. In this study, the authors have attempted to explore the long-term impacts of repeal and reinstatement of the UHL by using 13 to 16 years of data. A before-and-after study with a comparison group and empirical Bayes methods was adopted to account for the passage of time and its effect on other factors such as exposure, maturation, trend, and regression-to-the-mean bias. A range of safety performance functions was developed on the basis of counties and parishes, and the expected fatal motorcycle crashes were calculated. The results showed that the UHL repeal still had significant effects on motorcycle fatal crash counts even 7 to 12 years after the repeal of the law. The crash modification factors showed that the UHL repeal increased the number of motorcycle fatal crashes by 15% to 41%, whereas reinstatement of the UHL decreased it by 21% to 27%. It is expected that the results from this study could be helpful for state policy makers to clearly understand the effects of the UHL on reducing motorcycle fatal crashes.