ABSTRACT

The objective of this paper is to provide a parsimonious model for linking road safety performance to variations in socio-economic factors in the countries of the European Union (EU) in the period 1970-2002. The overall relationship between road safety and economic growth is a relevant and timely issue, particularly when considering the potential benefits of road safety improvements and their impact on the well-being of citizens in Europe. The paper builds on previous models of road safety performance, which have been developed for various countries, by extending them to a European context. The main contribution of this paper is the development of a model that can be applied to the entire European Union, and the estimation of its parameters for the period 1970-2002.

MODEL DEVELOPMENT

Aggregate fatality and population data from European countries between 1970 and 2002 have been used. The data have been obtained primarily from VITAS (International Road Traffic and Accident Database). Official representatives of the countries have been approached to request data on road safety indicators. Additional data were obtained from various sources, including the European Commission and the United Nations. The data cover all 27 EU countries and 9 non-EU countries, and include fatality count, population, and GDP data. Data for some countries were not available or were of poor quality, leading to the exclusion of other countries from the analysis.

CONCLUSIONS

Using fatality and population data from EU members and 9 non-EU countries for a period of 33 years (1970-2002) several models were developed, fitted, validated and compared, including simple non-linear models, their log-transformations and the related autoregressive models. The model results were in line with the expected relationships and also showed superior predictive properties for most of the countries.

FIGURE 1. Presentation of the data set: fatalities per vehicle (decreasing trend) and vehicles per population.

FIGURE 2. Model diagnostics for non-linear and AR non-linear models (France, Germany).

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