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Case Study on accidental study and safety measures on State highway

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A B S T R A C T

Several studies, including one published in a journal, have shown that the accidental road accident scene in India, like many developing countries, is characterized by mixed traffic, which includes human-powered vehicles such as bicycles and tricycles (cycle rickshaws), animal-drawn carts, and motor vehicles of various sizes and speeds. The many types of models that have been constructed in various nations to analyze accident scenes have been addressed. It is shown that these models are not comprehensive in that they do not account for all of the factors involved with the site of a traffic collision. It has also been shown that a large number of factors should be utilized in the investigation of accident sites on Indian metropolitan roadways. Independent factors affecting the accident scene include variables such as the handrail index, the congestion index, the bicycle lane index, pedestrian violations, the disturbance index, interactions between various modes, road characteristics, and so on.

Keywords:

Road Transport, State Highway accidental Study, Department of Statistics, Highways Research Station, National Highway

1. Introduction

[Kumar et al., 1988] describe an accident as an unexpected and uncontrollable occurrence in which the action and response of an item, substance, or person result in personal harm or property damage [Kundra, 1988]. As defined by Jayachandran (1981), a traffic accident is a failure of the road-vehicle-driver system to execute one or more processes required for the vehicle to safely complete the journey without causing damage or harm. In an accident, the necessary and sufficient cause is a collection of variables that occur simultaneously and sequentially, each of which is essential but none of which is sufficient in and of itself. Gupta (1988) explains that the job of maintaining safe traffic on urban roads in India is challenging because of the combination of slow and rapid moving vehicles that use the same carriageway. Poor road geometry, a lack of traffic education among road users, a deficient traffic enforcement system, and road user behaviour are all factors that contribute to the rise in accidents in India, according to the World Health Organization. An accident may occur as a result of the interaction of two or more elements, such as cars, the road, the driver, other road users, and the surrounding environment, among others. The occurrence of each accident is the consequence of an individual sequence of events that is influenced by a large number of distinct variables and circumstances [Anitha Sreedhar, 1990]. Because of the rapid rise in traffic on Indian roads in recent years, the number of traffic accidents has increased dramatically [Kumdar et al, 1988] [Kumdar et al, 1988]. The road accident scene in India, as in many developing countries, is characterised by mixed traffic, which includes human-powered vehicles such as bicycles and tricycles [cycle rickshaws], animal-drawn carts, and motor vehicles of various sizes, shapes, and speeds, all of which are not separated by traffic segregation measures such as barriers or barriers to entry. In part because of resource limitations, the construction of roads has not kept pace with the increase in the number and quality of cars on the road system. Engineers, planners, and administrators have all expressed considerable worry about the situation. Work is being done to investigate the scene of traffic accidents in the Indian setting, with the goal of identifying and implementing appropriate solutions to reduce the number of accidents.

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1.1. Review of Literature

A rising trend of various gravity was mainly influenced by traffic characteristics, the conduct of road users and the environmental factors. The findings of investigations of traffic accidents carried out in different countries are evaluated. This section broadly presents the basic structure of various models designed to examine accident scenes, each of them taking into account one or more variables, under the following headings: population-based and vehicle ownership models; econometric and social variables; and traffic volume, road geometry and speed models. The bulk of the grouping was carried out by taking into account the primary criteria.

The length of the road in India is 46.7 km per 100 sq. sq. km compared to 294.7 in Sri Lanka,101.6 for Sri Lanka, 274.5 for France, 195.1 for West Germany. In Switzerland 142.8, in UK 152.8, in US 66.8, in New Zealand 34.3 and in Australia 11.3. In India the length on the road is 2'290 km, compared to 9,470 in Japan, 4'606 in Sri Lanka, 28'080 in France, 7'894 in Western Germany, 6'258 in U.K., 9,918 in Switzerland, 28'400 in U.S.A., 29,703 in New Zealand and 60,052 in Australia. India's road network is one of the world's biggest. The entire length of the road in the nation was approximately 0.4 million km. Today it is about two million kilometers. [Jojana, 1991]. 1991. The length of the route was extended in India, from 475.343 km between 1980 and 1983, to 1.587.000 km, reflecting an average yearly growth of 9,35% [Kumdar et.al., 1988]. Primary systems including national highways, whose total length now is 33,612 km, play a major role in road transport. The National Highway Network was added under the seventh plan 1902 kilometers. These national roads carry about 1/3 of the overall road traffic, but they account for less than 2 percent of the entire length of roads [Yojana, 1991].

Road accidents in Indian Cities have been proven to be a significant problem leading to massive economic loss. Qliere is required to reduce the accident rate by conducting a thorough study of the variables responsible for creating accidents. Although many factors related to traffic, road flows, environmental conditions and the conduct of road users have influenced road accidents, a number of models have been developed that ignore the complexity of the factors associated with accidents and involve only one or two variables such as the population, vehicle ownership and road length. Such models are aggregate and try to reduce the complexity of the accident?) Many writers tried to analyse accidents using econometric and sociological factors, such as actual income, intake of alcohol, speed, male proportion to full drivers, rural/urban driving ratio, motorcycle to automobile ratios, industrial activity and safety regulation. These models are better than the preceding category since they have at least included a number of factors that affect indirectly the incidence of road accidents. They would not, however, be helpful in an urban setting in which there are significant contributing variables from road conditions and their surroundings, road user behavior and traffic flows. Some writers developed models utilizing traffic and characteristics such as the curvature of the road, the width of the pavement and the number of crossings per kilometer. The models described here are affected by the failure to take all key factors that contribute directly to accidents. These models do not also represent and reflect the mixed traffic scenario observed in emerging country metropolitan regions. Road traffic in a developing nation such as India is made up of slowly moving vehicles such as bikes, tricycles, biking shasks and animal carts, and rapidly moving vehicles 7 such as buses, lorries, tractors, automobiles, autorickshaws and two-wheelers. The vehicles have various sizes, shapes and speeds. In many cities, the road network cannot be maintained at an acceptable level of service for different reasons. Many traffic managements actions to streamline flows and minimize conflicts in and between different modes of transport have been unsuccessful since road users have failed to react in the correct way. All factors led to a growing trend in our traffic accident scene leading to a major economic loss to society.

The modelling of the traffic accident scene combined to impact all important variables in the road conditions and the surroundings needs a thorough study of the complicated situation^ road user behavior and traffic flow Although such attempts may need a thorough database, an updated comprehensive model is still needed to analyze the accident scene in mixed traffic circumstances in the main metropolitan centers.

1.2 A**ccident Scene in Metropolitan Cities**

Cities are high-accident-risk environments, with a high likelihood of being involved in an accident of some kind. However, despite the fact that just around 27 percent of the country's population lives in metropolitan areas, about 75 percent of all accidents occur in cities and towns. The country's major cities alone are responsible for more than half of all road fatalities, and their proportion of fatalities in each state is likewise significant [Srinivasan, 1991]. Calcutta, for example, was responsible for about 66 percent of the incidents reported in West Bengal, while Bombay was responsible for approximately 63 percent of the accidents reported in Maharashtra. According to Subramaniam (1988), between 1980 and 1986, the number of road traffic accidents in India's metropolitan cities increased from 51,214 to 62,617, while the number of people killed increased from 3,027 to 4,305, and the number of people injured increased from 2,5313 to 32,818 [Subramaniam, 1988]. As a result, a thorough investigation of the accident site in an urban setting is required. Within India, Madras ranks third among metropolitan cities in terms of road traffic fatalities per 10,000 cars [Dinesh Mohan, 1986], making it the most dangerous city on the road.

1.2.1 ROAD ACCIDENTS ABROAD

Compared to other countries, India had the highest number of accidents per 1000 cars in 1985, with 6.7 in France, 10.7 in West Germany, 3.6 in Sweden, and 8.6 in Japan, according to the World Health Organization. The mortality rate in India was 4.33 per 1000 cars, which was much higher than the rates in the United Kingdom (0.26), France (0.37), West Germany (0.27), Sweden (0.17), and Japan (0.14). [Srinivasan, 1991] Jacobs and Bardsey (1977) found that road accidents accounted for almost 17 percent of total fatalities attributable to all causes in 15 poor nations, with TB and malaria accounting for 16 percent and 2 percent, respectively. At the same time, the number of traffic deaths per 100,000 people in India in 1985 was 5.2, whereas the comparable figure for France in 1984 was 21 and Japan's was 10 [Victor, 1989; IATSS, 1986].

1.3 ***Material and Methodology***

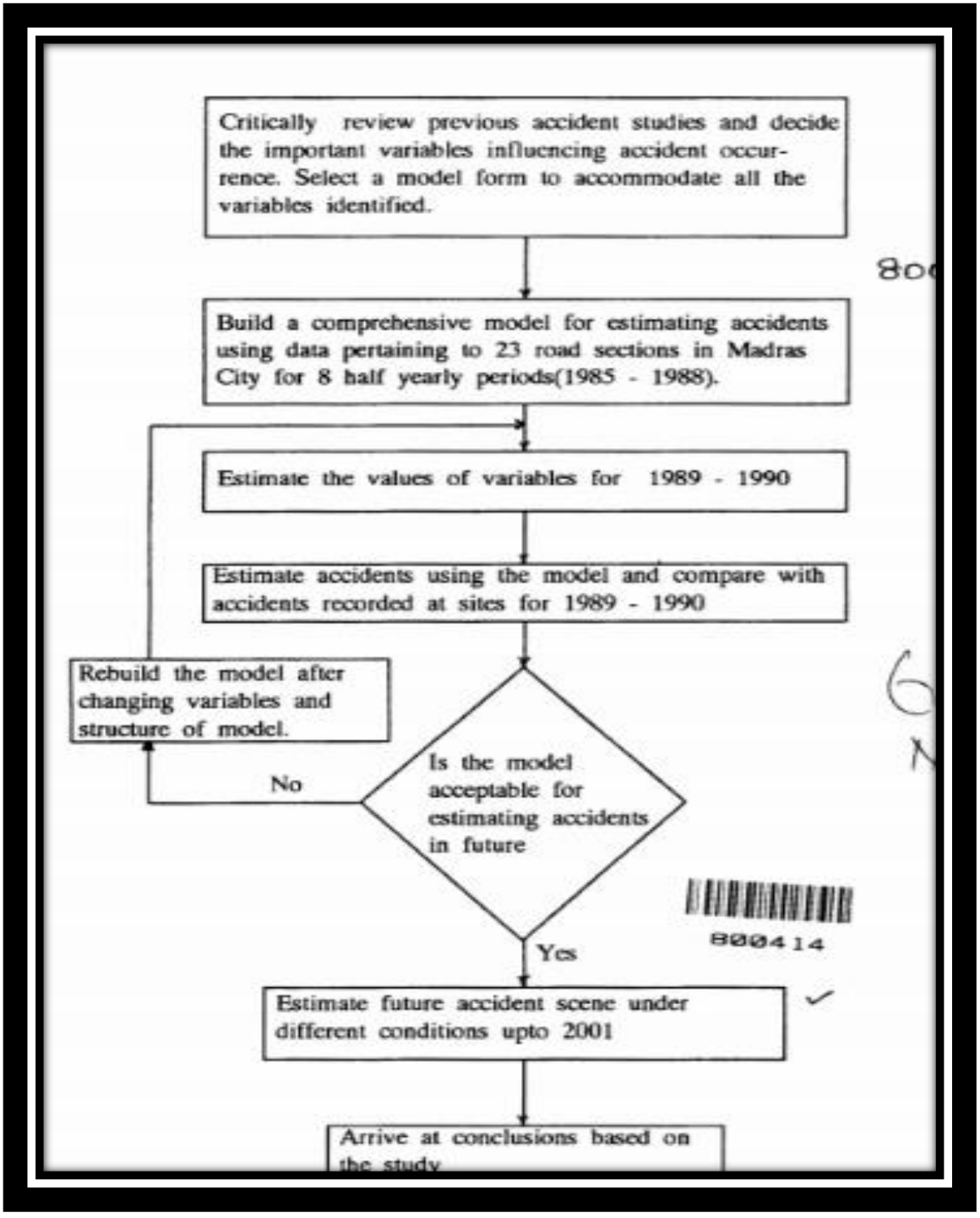

Figure 1.2 (a) Showing Complete Methodology based on Review of Various Research article

*1.4 **Results and discussion***

In a developing nation such as India, road traffic comprises of moving slow vehicles such as bicycles, bikes, rickshaws and carts pulled to animals, and moving quickly vehicles such as buses, lorries, tractors, automobiles, autorickshaws and double bikes. The vehicles are of various dimensions, shapes and variable speeds. In many cities, the road network could not be maintained at a desirable level of service for different reasons. Many traffic managements actions to streamline flows and minimize conflicts in and between different modes of transport have been unsuccessful since road users have failed to react in the correct way.

A distinct image is given in the traffic scene in cities of most nations compared to cities of affluent countries. Modeling the scene of traffic accidents that include the influences of all variables linked to road and environmental conditions, use and traffic needs a thorough study of the complicated scenario. The most often reported model accident prediction does not take care of mixed flows, road and environmental variables, interactions between the various types of fast-moving vehicles and interactions between slow- and fast-moving vehicles. updated model was needed to predict accidents in mixed transport circumstances taking account of all the relevant variables. Although there may be various methods to deal with the issue of creating a complete model, it is through a multiple linear regression technique that all variables may be adapted and aid to assess the impact of each variable. Multiple linear regression approaches are deemed appropriate to create a complete model that can account for all relevant variables. This technique allows one to delete variables which do not contribute significantly from a given set of independent variables. The criteria to be utilized for the selection of a variable for regression is the size of the partial

2. Conclusion and Future Scope

In order to assess and compare the explanatory accuracy of the prediction models, Theil proposed U-statistics as the root of the ratio of total squared discrepancies between the values observed and estimated and those observations. Azero value orthels U-statistic implies flawless explanation and extremely poor explanation is indicated by a value of. The lowest-value model thus has good explanatory accuracy.

Road accidents are influenced by a large number of factors related to road conditions, traffic flow, environmental state and road user behavior. But models have been generally built ignoring the complexity of accident occurrence and involving only one or two variables like population, vehicle ownership, road length, etc. Such models over-simplify 90 the complexities of the accident incidence. Number of authors have attempted to study the accidents ninety relating to econometric and social variables like real earned income, alcohol consumption, vehicle speed, percentage of male drivers to total drivers, ratio of motor cycles to cars, industrial activity, safety regulation, etc. These models are better than the previous group since they have considered at least a set of variables which indirectly influence the occurrence of road accidents. However, they too would not be useful in Indian context, where the contributing factors are large in numbers associated with road conditions, road user behavior and traffic flow characteristics. Some authors have built models using traffic volume and road features like road curvature, pavement width and number of junctions per km. Models discussed here suffer due to their failure in taking all important variables which directly contribute to accident occurrence. These models also do not reflect and account for mixed traffic flow prevailing in urban areas in India. Modelling the traffic accident scene bringing together the influence of all relevant factors is therefore requiring attention

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