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An Investigation on accidental Study and its Analysis on Road

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A B S T R A C T

Records on road accidents from the police authorities, insurance companies, bus and truck depots were analysed, drivers and other road users were interviewed, and observations were noted. An attempt was made to identify specific trends and relations in the accident patterns and investigate the perceived 'causes1 of accidents. In certain cases, experimental studies could not be done because of constraints like workforce, time, existing rules etc. Structurally, the reviews the relevance of Ergonomics in analysing 'causes' of road accidents concerning the accident aetiology. Investigates the magnitude of road accidents in India and collates data from regional police authorities and publications. It is essential to mention that data were collected about the urban traffic only, and highway accidents or traffic patterns were not considered. The pedestrians are identified as a vulnerable group. Specific trends, like, the number of fatal accidents vis-a-vis the number of vehicles, are shown. This part also discusses that though there are enough accidents reported, the existing surveillance system needs improvement.

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

1. Introduction

1.1 Accidents and Human Behaviour:

There is a propensity in many analyses of 'human variables' as cause of' accidents to infer that they stem from personality characteristics. As stated, a dangerous condition with or without damage and injury, and death may lead to an accident. Too often, it is overlooked that a "human component" as a direct cause of the genesis of an accident may only imply some human conduct, which is defined by the characteristics and situations of the person. Human behaviour and accidents have more than ergonomics and general psychology been investigated by individual psychology. Ergonomic study on the topic has significantly benefited; human mistakes have been given greater attention. Therefore, ideas of the more general issue of the mistake mechanism may successfully be applied to the particular problem of hazardous conduct. The causes of accidents may then be studied without waiting for an accident. A simple causal chain may lead to accidents, and a coincidence of numerous variables can be more accurately described. None of these variables can be sufficient to cause an accident on their own. This means that every 'causal' element is a 'risk factor in a particular scenario.' This risk involves the presence and coincidence of other variables and the outcome of an accident. One of these variables is frequently a feature of human behaviour that does not inevitably cause an accident but simply a particular danger in a specific scenario. It is noteworthy that while the likelihood of such 'risky' behaviour is often extremely low, the repercussions of these occurrences may be significant.

Interestingly, all of the so-called 'unsafe actions' may not be ascribed to human conduct. Because some behaviour types but not all types can be modelled and articulated. Even if it is, it is hard to collect all the possible human behaviour in every conceivable scenario.

To provide an example, it is feasible and necessary to pass many tests while developing an immersion heater to evaluate its engineering dependability. However, none of us can guarantee that the customer uses this immersion heater in a home setting in how many ways and circumstances. While discussing hazards or hazardous conduct, we should consider that risk-taking is one of the behaviours that are also a trend. The truth is that the risk is estimated the

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most frequently, and maybe 2 An ergonomic evaluation of road accidents and road safety in India leads to an injury and an accident. Systems should thus be built to ensure that individuals risk themselves even when the frequency is 1:100. 1.2 Comportment connected to the accident: Several models of conduct, some with at least some common denominators, have been suggested. For example, a model developed by Drury and Brill (6) suggests that accidents occur when the immediate requirements of the job to be carried out exceed the individual's momentary skills. From an ergonomics point of view, physiology, psychology, biomechanism, information processing, and anthropometry may be defined in human capacity and capacities. They suggest a type of task analysis in accident analysis in which the requirements of the work are represented in the exact words as information on what people can do about the job. Therefore, the task needs could be determined concerning the force and the direction and distance of movement required, and human capacities, in turn, could be defined concerning the percentage of the population capable of using such force. This kind of comparison offers a constructive reference framework for the occurrence of the accident. Mackworth, Buck, Jerison, Sanders and Hiemstra have examined the task performance of the drivers with particular regard to attentiveness and ability. Meeting the sequence of behaviours included in the sequential Ramsey model for phases leading to accidents (including the ability to avoid risk) does not guarantee the avoidance of accidents, but it lowers such possibilities. Even in the best of intentions and the availability of necessary skills, accident factors lead to human affairs. However, failing to meet the above sequence increases the likelihood of accidents. A model like this that crystallizes the components of behaviour in accidents, it can be helpful to focus attention on human factors such as the adequate presentation of relevant hazard-related information (as in the displays), the design of situational elements that can be useful for avoiding accidents (control equipment, workspace etc.) and training staff in action to combat hazards. One actual research topic should be these hazardous behaviours (and near-accidents) and not just accidents, which seldom occur from these activities. Therefore, the issue we have to examine is why individuals behave insecurely. If we are restricted to ergonomics, we must investigate how the overall physical layout and psychological elements of work and traffic affect risk management. An accident mayor cannot cause any harm. If an injury is generated, the accident's phenomena are usually called 'simple,' 'grave,' or 'fatal.' But, indeed, it's not a qualifying accident, but these are the degrees of harm. Simultaneously, if circumstances leading to an accident create a severe injury to an accident, an ergonomic assessment of road accidents and road safety in India may cause a superficial injury. The word 'injury' has been defined as 'damages' pushed to the Agent – Host - Environment Triad by aberrant energy transfer.

1.3 Theories of Accident Causation: When redefining and evaluating the word 'accidents,' it was apparent if 'causes,' "chances", or "accidents" could be ascribed to these, Consideration of the theories of 'Unsafe Act' and 'Unsafe Condition' may be mentioned concerning their use in analysis of road accidents and the development of preventative and inspection measures in India. Even with a 'chance factor,' considerations of ergonomic principles may decrease a) the incidence frequency and b) the severity of accidents or the 'energy transfer' levels between the components of the system. As shown in several research, it is not that easy to determine the causes of accidents and injuries. Many theories explain why specific individuals become wounded. However, most of them are not validated by scientific findings. Additional information seems to indicate a shift away from accusing employees of their injuries for a more advanced strategy. Some ideas that may be regarded as references are as follows: Everyone showed great concern about the issue. Work is being done to examine the site of traffic accidents in the Indian region to find and implement suitable measures for reducing accidents when redefining and evaluating the word 'accidents,' it is evident if 'causes,' "chances", or "accidents" could be ascribed to these, Consideration of the theories of 'Unsafe Act' and 'Unsafe Condition' may be mentioned about their use in analysis of road accidents and the development of preventative and inspection measures in India. Even with a 'chance factor,' considerations of ergonomic principles may decrease a) the incidence frequency and b) the severity of accidents or the 'energy transfer' levels between the components of the system. As shown in several research, it is not that easy to determine the causes of accidents and injuries. Many theories explain why specific individuals become wounded. However, most of them are not validated by scientific findings. Additional information seems to indicate a shift away from accusing employees of their injuries for a more advanced strategy. Some ideas that may be regarded as references are as follows: Everyone showed great concern about the issue. Work is being done to examine traffic accidents in the Indian region to find and implement suitable measures for reducing accidents.

1.1. Review of Literature

A literature review is a screenplay of a scholarly article that includes the material presented with practical results and procedural aids for a certain topic. The literature on the issue has been examined to identify the loophole in research. Literature about road accidents in India include books, corporations, theories, theses, study reports and papers published in various journals by academics and researchers. The assessment of this literature provides an idea of focusing on the unknown region and distinguishing the present research from previous studies. Although the current pattern in producing good performance vehicles combined with ever-increasing mobility requirements, the potential risk of increased speed, if not closely and efficiently observed, may outweigh other road safety management tasks, especially in emerging countries where road safety creativity is still weak. Paden&Slinkey (2004) highlighted those economic costs are just the iceberg tilt. Many others are profoundly impacted by each person killed, wounded or handicapped by a car accident. Several households are pushed further into shortage by long-term medical expense, loss of a family pantry or the additional weight of worry for the disabled. A review by Higley et al. (2000) showed that the hands-free Aston driving simulator had no safety benefits. The relative impacts on driving behaviour of handheld and hands-free mobile phone applications are examined. Thirty participants aged 26.93 completed four simulated drives, in which both hands-free and a handheld phone had to function with incoming calls. A heart rate sensor was attached to the simulator to measure deviations from the heart rate members utilizing mobile telephones. The research indicates that drivers often use various compensating measures to preserve a normal driving behaviour while engaging with in-vehicle gadgets. Haringey et al. (2001) examined the potential driving consequences of cell phone use. The comparative effects on driving behaviours from handheld and hands-free mobile telephones were studied with 30 subjects using stimulators and details. The findings show that the average speed and the calibre of the speakers on the mobile phone decreased. Drivers are often engaged in a collection of compensating methods to ensure an appropriate degree of conduct while interconnected with car equipment. The sample of driver safety evaluations linked to a set of typical road conditions was studied by Bojan Wang (2002). Prior accident rates could only work as forward-looking measures of target risk if it is believed that no one would ever change

and if nothing from previous experience is presumed to have been gained. A face-to-face assessment of a driver's model by Sydney offers data to evaluate an ordered probity model, a technique model often used for travel performance studies. In the examination, a responder assesses all the scenarios. The primary purpose of this study is the development of a system for the measurement of driver's observed road safety. Bojan Wang (2002) has studied a sample of drivers' evaluations of common safety-related road conditions. A sample of Sydney drivers has been utilized to assess an orderly probity model; a method frequently employed to analyse travel behaviour. In the study, 27 scenarios were evaluated to determine a driver's perceived safety on the roadside. In the United States, 42,815 fatalities occurred in 2002 and nearly 3 million non-fatal injuries are caused by automobile accidents. The main cause of injury-related mortality, the top cause of death for those 1 to 34 years and the third-largest cause of non-fatal injury, is accidents in road traffic. Sometimes it's not remarkable to be number one. The United States now owns the greatest motor-fatalities global record and ranks 27th among 34 nations with 15.6 deaths per 100,000 people. In 34 reporting nations, the U.S. injury rate exceeds the mean of 11.7 per 100,000 people (National Safety Council, 2002). Cities are high-risk settings with a high probability of being engaged in a certain type of mishap. However, although only approximately 27% of the nation's population resides in urban regions, over 75% of all accidents occur in urban and urban areas. More than half of all road deaths in the main towns of the nation alone are caused, and their percentage of deaths in each State is as high [Srinivasan, 1991]. For example, Calcutta was responsible for roughly 66 per cent of recorded West Bangladesh mishaps, while Mumbai was responsible for approximately 63 per cent of reported Maharashtra accidents. According to Subramaniam (1988), from 1980 to 1986, in the cities of India, the number of road accidents rose from 51,214 to 62,617; in the case of 3,027, and the case of injuries climbed from 2,5313 to 32,818 [Subramaniam, 1988]. Therefore, a comprehensive survey of the accident scene in an urban environment is necessary. Madras ranks third in India concerning road deaths per 10,000 vehicles [Dinesh Mohan, 1986], making it the most hazardous city globally.

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 developing nations, with T.B. and malaria accounting for 16 percent 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].

1.2 Material and Methodology

A literature review is a screenplay of a research article that includes current material, including practical results and theoretical procedural help for a particular topic. To identify the loopholes in research, the issue literature has been examined. The literature on road accidents in India includes books, corporations, theories, theses, reports and papers published in various magazines by academics and researchers. The assessment of this literature provides an opportunity to concentrate on the unknown region and distinguish between the present research and the previous studies. Although current trends for the production of high-performance cars combined with the ever-growing need for mobility may surpass other road safety management work, especially in developing economies, where road safety creativity is still weak. Paden&Slinkey (2004) highlighted that the economic expenses are just the iceberg tilt. For each individual killed, wounded or handicapped by a vehicle accident, many others are severely impacted. Many families are dragged further into the shortage by spending on extended medical care, death of a family breadwinner or more load on the handicapped. 78 A review by Haringey et al. (2000) found no safety benefits of the Aston-free hands-free driving simulator. The relative impacts on driving behaviors of the handheld and hand-free mobile phone application are examined. Thirty participants with median age 26.93 years complete four simulation drives in which they need both the hand-free and the handheld telephone to operate on incoming calls. A heart rate sensor has been attached to measure variations from the members with a heart rate while mobile phones are used. The research indicates that drivers often use a series of compensatory measures in order to maintain a standard level of driving behaviors while interaction with car appliances, a minimum for such devices being evaluated. Haringey et al. (2001) examined the potential impacts on driving conduct of cell phone use. With 30 individuals applying stimulators and details, the comparative effects of handheld and hand-free mobile telephone driving behaviors were analyzed. The findings showed a reduction in average speed and the quality of the participants during the mobile phone discussion. Drivers often engage in a variety of compensating methods to maintain an acceptable level of driving behaviors while interconnected with cars. Bojan Wang (2002) studied a sample of driver safety evaluations in the context of a set of typical roads. Prior rates of accident can only work as a forward-looking measure of objective risk if nobody ever change is acknowledged, and if nothing is supposed to be gained from previous experience. A face- to-face evaluation of a Sydney drivers model offers the data for an ordered probity model, a technique model often employed in travel performance research. In the review, a responder assesses all the scenarios. The primary purpose for this study is to create a system for measuring the driver's observed road safety. Bojan Wang (2002) has studied a series of driver evaluations of common safety-related road conditions. A sample of Sydney drivers has been utilized face to face to assess the ordered probity model, a method frequently employed in travel behavioral analyses. In the review participants evaluated 27 scenarios to determine the safety felt by the driver on the road. In 2002, there were 42,815 fatalities and almost 3 million non-fatal injuries in road accidents. The roads are thus the main cause of injury-related mortality, the top death cause for those aged 1 to 34, and the third largest source of non-lethal injuries. Sometimes it's not remarkable to be number one. The United States presently has the world's largest motor death record and ranks 27th out of 34 nations with 15.6 fatalities per 100,000 people. The U.S. injury rate was over 11.7 per 100,000 people in 34 reporting nations (National Safety Council, 2002). Cities are high-risk settings, with a high probability of some kind of mishap. However, although only about 27% of the country's population resides in urban areas, over 75% of all accidents occur in cities and towns. More than half of all road fatalities are caused by the main cities of the nation alone, and the percentage of deaths in every country is as high [Srinivasan, 1991]. For example, Calcutta accounted for about 66 percent of the

recorded occurrences in West Bengal while Bombay was responsible for over 63 percent of those reported in Maharashtra. Subramaniam (1988) reported that between 1980 and 1986, the number of road accidents in the metropolitan cities of India rose, from 51.214 to 62.617, while the number of persons killed rose from 3.027 to 4.305, with injuries rising from 2.5313 to 32.818 [Subramaniam 1988]. Consequently, a comprehensive survey of the accident scene in an urban environment is needed. Within India, Madras is the third largest city on the road with deaths of road transport in 10,000 vehicles [Dinesh Mohan, 1986] and the most hazardous city on the road.

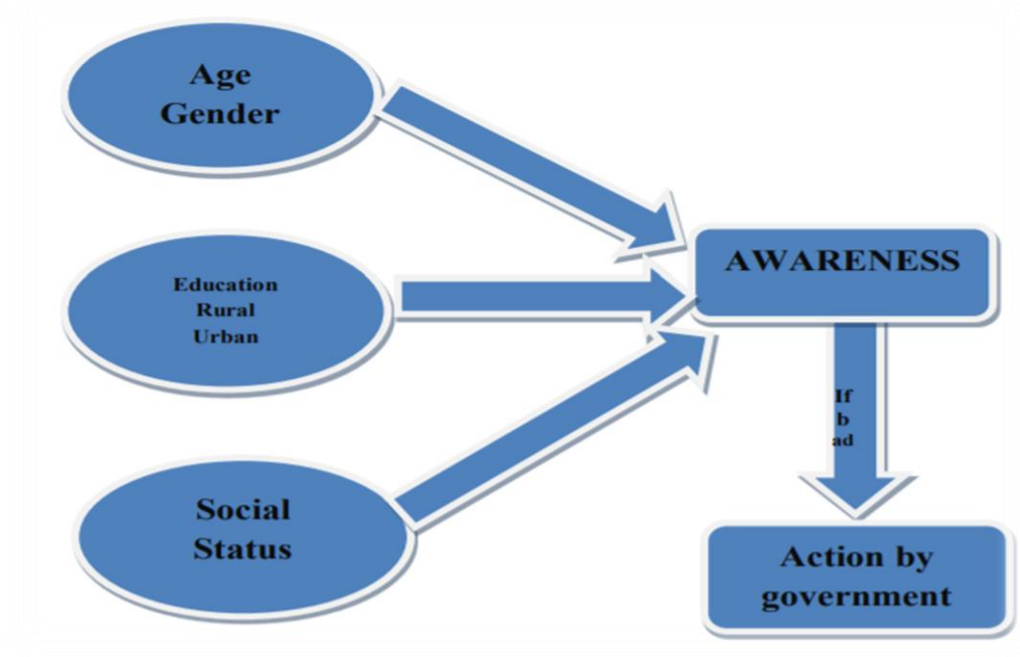

Fig.1:Action Plan

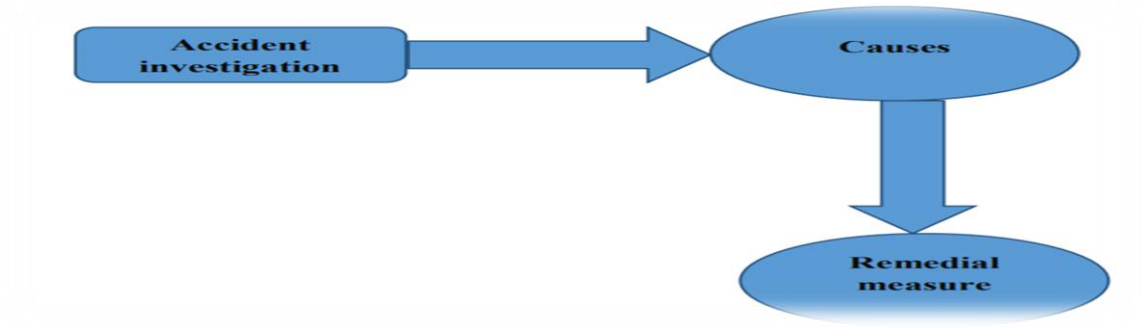

Fig.-2: Case Study

*1.3 **Results and discussion***

This research has been divided in to three parts. First part is the comparison and analysis of fatal accident data inBikaner and Sikar. The accident data "s collected from traffic investigation wing located in Bikaner and Sikar for the period 2011 to 2014 and co-coordinating data "s components, the factors used in the data Analysis are

1. Age wise
2. Time wise
3. Vehicle wise
4. Road wise. Age wise accidents from the use of above factor that analysis was found with the Age wise ration at Bikaner city has more accident death when compared with Sikar in the period 2011-2014. From the research it is clear that Bikaner has a greater number of accidents than Sikar. One hundred and two accidents on average happen as in each group every year. 152 It is also observed that 20-30 age group has more fatal accidents than

middle age group. 127.9 % accidents on an average occur within 20-30 age group than other groups in Sikar and Bikaner every year. This may be due to rash driving, drunken driving, due to old age people driving also meet with fatal accidents. Time wise accident from the use of above factor the present research found that more accident happened 2pm to 10 pm. during the severity of accident that during 6pm to 8pm and has more fatal than the other

Time in Hrs	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
6to8	8	24.5000	7.94625	2.80942	17.8568	31.1432	17.00	38.00
8to10	8	39.8750	11.95751	4.22762	29.8783	49.8717	22.00	56.00
10th12	8	36.2500	13.49868	4.77250	24.9648	47.5352	21.00	57.00
12-14	8	38.7500	16.14886	5.70948	25.2492	52.2508	12.00	55.00
14-16	8	46.0000	15.56553	5.50325	32.9869	59.0131	22.00	63.00
16-18	8	49.3750	14.26221	5.04245	37.4515	61.2985	29.00	66.00
18-20	8	49.3750	13.19023	4.66345	38.3477	60.4023	27.00	63.00
20-22	8	45.7500	14.70423	5.19873	33.4570	58.0430	24.00	65.00
22-24	8	37.6250	11.13473	3.93672	28.3161	46.9339	19.00	52.00
24-2	8	14.5000	10.39230	3.67423	5.8118	23.1882	5.00	39.00
2-4	8	11.7500	10.64693	3.76426	2.8489	20.6511	2.00	36.00
4-6	8	14.5000	6.45866	2.28348	9.1004	19.8996	7.00	28.00
Total	96	34.0208	17.92145	1.82910	30.3896	37.6521	2.00	66.00

Figure -3 Data of maximum and minimum of Accidents

Figure Shows Data of maximum and minimum of Accidents in Figure-3. TheBikaner city faces more accidents when compared to Sikar. The reason for the accidents may be due to drowsing while driving in the afternoon, after lunch. Rushing and poor visibility are the other causes for high accidents rate in the evening. Road Wise accidents from this analysis it was found that corporation road have more accident than city roads. In Sikar and Bikaner Road accidents in terms of road wise (N.H., S.H., OCR) are compared. The above findings and discussion prove that the other corporation road more accidents occurred than other roads. This may be because there are a greater number of T-Junction Road, Cut Road meet Branch Road to Main Road without speed Brakes, inadequate Signal Boards and without Lighting facilities. These are the reasons for occurrence of more accidents in Bikaner than in Sikar

2. Conclusion and Future Scope

The company developed U-Statistics as a root for the ratio of total square differences between the values seen and predicted and these observations, to evaluate and compare the explicative precision of the prediction models. Value of aero U-statistic orthels indicates faultless explanation and a value of very bad explanation. The lowest-value model is thus well explained.

Road accidents are affected by a variety of variables relating to road characteristics, traffic flow, environmental conditions and the conduct of road users. But models have usually been constructed which ignore the complexity of occurrences and include just one or two variables, such as population, car ownership, road duration, etc. Such models simplify 90 more often than not the complexity of the accident. The number of writers has tried to analyze the accidents in ninety years in relation to economic and sociological factors (real income, intake of alcohol, vehicles, male drivers' percentage to total drivers, automobile motorcycles, industrial activities, safety regulations, etc.). These models are better than the preceding category, because they at least include a collection of factors that affect indirectly the incidence of road accidents. But they would not be helpful in the Indian context where huge numbers of contributing variables related to road conditions, road user behavior and road flow characteristics are concerned. Some writers have constructed models including traffic volume and characteristics such as road curvature, pavement width and number of intersections per kilometer. The models described here are affected by the failure to take all the key factors that contribute directly to the accident. These models do not also capture and represent the heterogeneous flows in metropolitan areas in India. The modelling of the road accident scene combining the impact of all important variables requires Consideration. The company developed U-Statistics as a root for the ratio of total square differences between the values seen and predicted and these observations, to evaluate and compare the explicative precision of the prediction models. Value of aero U-statistic orthels indicates faultless explanation and a value of very bad explanation. The lowest-value model is thus well explained.

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