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"A Study of Accidents on National Highway No. 4 (48) and Traffic Management (Pune-Kagal Highway)"

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Abstract:

Like any other country India is also facing the problem of growing number of accidents on National Highways which is dangerous for economic growth and development of developing countries. Youngers are the most contributing in fatal and injured type of accident record who are the assets of the nation for upcoming development. In order to control increasing number of fatalities and injured accidents on National Highway Advance Traffic Management System has been implemented but even though the number of accidents are recorded in highest number due to silly mistakes. This study is conducted on particular stretch of National Highway 48 in order to bring in light the seriousness of the deaths causing in accidents on NH48. This study will reveal the fact and cause of accidents on NH4 (48) and suggesting some measures which will help to curb the growing number of accident.

Keywords: Accidents; National Highway 48; Traffic Management System; Ministry of road transport

Introduction

India is one of the leading country in road fatalities and highway accidents and ranking first in this record. According to the published report by road ministry of India it seems that even introducing advance traffic management system the number of road crashes is still high. In order to analyse the content of FIR (First Information Report) the secondary data collected from the Highway Police stations from Kognoli Highway Police station, Kini Highway Police station, Karad Highway Police station and Satara Police station on the basis of selected samples. The researcher has considered the cumulative percentage while tabulating the data in order to explain the class interval at the later stage without going into the total calculation of the frequency percentage. Hence in order to ease the analysis and interpretation the cumulative percentage column has been introduced with the sole objective of interpreting the data coming under different class intervals.

There are 228 highways in India among which the National Highway 48 is taken for research study. As per the secondary data collected by researcher, it is found that India ranks first in road crash fatalities where 54% of the young population i.e. between the age group 15-35 are fatalities and most of the peoples are suffering from non-fatal injuries like permanent disabilities, damages, bed-ridden, etc. Undoubtedly National Highway has become fastest route and made transport easier. But as it has killed millions of people in road accident, so the Indian National Highways were declared undoubtedly most dangerous highways in the world.

Road Accidents In India

Not only on national highway but percentage of road accidents have increased, according to figures released by Government, more than 140,000 people were killed on Indian roads. Road accidents are common in India and often it takes place due to poor driving or bad maintenance roads and vehicles. This resulted into total number of fatalities has increased by 4.6% than previous year. More than half of the people were killed in more than 500,000 road accidents and the victims are between the ages 15 years to 34 years.

- **The Report Released By India's Ministry Of Road Transport Says:**

- The number of people killed in the Road accidents in 2015 has increased to 146,133 from 139,671 in 2014. There were 501423 road accidents in 2015 and 1,374 accidents everyday up from 489,400 in 2014.The number of injured people in accidents have become 500,279 in the year 2015 which was 493,474 in 2014 and 400 road deaths takes place every day on Indian roads. Nearly 8 deaths in 10 accidents were caused by drivers, with 62% of those are blamed on speeding. It is found that at every 3.6 minutes one death takes place due to road accidents in India.

As per The Indian Express news report, in the year 2016 the fatalities percentage has increased due to road accidents than 2015. The country recorded at least 480,652 accidents in 2016 and leading to death 150,785. It becomes clear that at least 413 people died every day in 1,317 road accidents. Going through the statistics, the data reveals that at least 17 deaths occurred in road accidents in 55 accidents every hour in given time period. This information has been collected from the source: NHAI in reply to an RTI (Times of India)

SCOPE OF THE STUDY:

- **Topical Scope:**

  The Topical scope encompasses the Road Accidents occurred on National Highway 4(48) from Pune - Kagal of Maharashtra State to Kognoli of Karnataka State.

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Periodical Scope:

The Periodical scope is be limited to latest five calendar years January 2015 to December 2019.

- **Geographical Scope:**

The total length of Pune - Bengaluru National Highway No.4 (48) is 2,807 km (1,744 miles) which is one of the fastest route of transportation. The Geographical scope of this research was restricted to the Pune - Kagal National Highway No. 4 (48). Its length is 222 km and it takes around 3 hour and 28 minutes. Hence to study the wide area this particular NH4 (48) was chosen for the study. Four Toll plazas was being taken under study in the selected geographical area of Pune - Bengaluru National Highway 48 namely, "Kognoli Toll Plaza", 'Kini Toll Plaza', 'Tasawade Toll Plaza' and 'Khed shivapur' Toll Plaza.

- **Analytical Scope:**

The analytical scope of the study was to collect the data in order to fulfil the objectives of the study decided to check the hypotheses drafted whether accepted or rejected, researcher has used KS (Kolmogorov Smirnov) test for One-dimensional hypothesis and Chi Square Test.

Significance Of The Study:

The present study have covered the various issues which lead to Road Traffic Accidents. The researcher has made attempt to suggest measures addressed to the Government of India, Policy makers, Policy implementing authorities, etc. This study is beneficial to the Government authorities and suggesting measures to minimize rate of accidents.

Research Methodology Adopted:

The types of research adopted are as follow:

1) Descriptive Research:

Descriptive research was adopted to know the exact number of accidents took place on NH4 (48). During the study period the FIR (First Information Report) from concern highway police stations were taken and respondents plying on NH4 (48) were also personally interviewed, for this purpose questionnaire was being designed, presented, modified and administered.

2) Exploratory Research:

Exploratory Research have covered the scope of identifying violation of traffic rules, life of the vehicle, type and age of vehicles, number of vehicles plying on National Highway 4 (48). Exploratory research helped researcher to identify the different ways of violation of traffic rules on highway as well as found many lacunas in traffic management system, daily which type of vehicle and what type and pattern of accidents has taken place as well as is analysed by exploratory research, age and life of the vehicle and action on bad condition of the vehicle is analysed.

Objectives Of The Study

1) To analyse the number of accidents on NH4 (48) since calendar year 2015 to 2019

2) To study the weaknesses in existing Traffic Management System.

Sources Of Data Collection:

1) Primary Data:

For the purpose of collecting primary data, a detailed and comprehensive interview schedule was prepared on the basis of objectives of the study. In order to collect the accurate information detailed questionnaire was designed and taken responses from the following stake holders. Researcher has physically observed and collected the data from the following stake holders

Research Sample Design:

In this present research study, all the accidents recorded on National Highway No.4 (48) Pune-Kagal had been considered. Out of the total number of accidents the number of accidental deaths and seriously injured was being considered for cross verification of data as well as the relevant respondents like Police Inspectors, RTO Officers, workers on Toll Plaza, Road constructors, Policy makers, Advocates, Doctors and Insurance Companies were personally interviewed.

2) Secondary Data:

The secondary data was collected from published and unpublished sources through:

1) Research at police Stations 2) Research at RTO Offices 3) Library Books 5) Journals 6) News Papers 7) M.Phil. Dissertations 8) Ph.D. Theses 9) Magazines and from Internet browsing etc.

Review of Literature

2.2.37: Singh Sanjay Kumar (July 2016): This paper is analysis of Road accidents at National, State and metropolitan city levels. According to analysis the death and injuries varies according to age groups, gender, month, time etc. After analysing it is found that between the age group 30-59 male fatalities and injuries are more than female. There is variation in fatalities risk across state and cities. Now a days the road safety situations are improving. Without increased efforts and new initiatives and the number of traffic death in India is likely to cross the mark of 2,50,000 by the year 2015. (Road Traffic Accidents in India: Issues and Challenges)

2.2.02 Nilambar Jha & Others (January 2004) this study is based on epidemiological factors related to road traffic accidents with the objective to assess the prevalence of road traffic accidents. This paper focusses on the main objective checking the percentage of injured and fatalities , victims in accidents of male and females as well as types vehicles involved, education of the victim and their occupational level. Further the worse thing to know that among all the victims, 83% of males and 17% were females in just one year almost all were the

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labourers. The article reports that the number of fatal road accidents is increasing rapidly. (NilambarJha, Jan 2004)

2.2.39 Yusuff and Others (August 2016): This study aims to investigate the extent to which road traffic accidents affects economic growth and also to analyze the effects of relevant socio economic variables on road traffic accidents in Nigeria between 1990 to 2013.The data is analyzed by using electrometric views and statistical packages and resulted that road traffic accident is inversely related to economic growth also shown negative relationship between Gross Domestic Product per capita, total road network and road traffic accidents. Finally authors have concluded that, there could be FRSC (Federal Road Safety Corps of Nigeria) by reducing poverty and increasing number of road network in the country. (Impact assessment of Road Traffic accidents on Nigerian economy,) 2.2.31 S.M. Salim khan, January 2016: This article is the result of problems of increased road traffic accidents. Study has been conducted on keen point's viz. victim's time of accident, day and month, type of accidents etc. Similarly other reasons are given which contributes the road accidents as alcohol consumption, dim light, cloudy and rainy season, bad and damaged road a conditions bad maintenance of vehicles defective tyres, unsafe acts of drivers. (Reason for Road traffic Accidents (victim's perspective))

Data Analysis

Content Analysis Regarding Accidents On Nh4 (48)

Table No. 1.3 Analysis of number of accidents in different years

Analysis of number of accidents in different years			
Years	**Frequency**	**Percent**	**Cumulative Percent**
2015	90	24.7	24.7
2016	67	18.4	43.1
2017	68	18.7	61.8
2018	68	18.7	80.5
2019	71	19.5	100.0
Total	364	100.0	

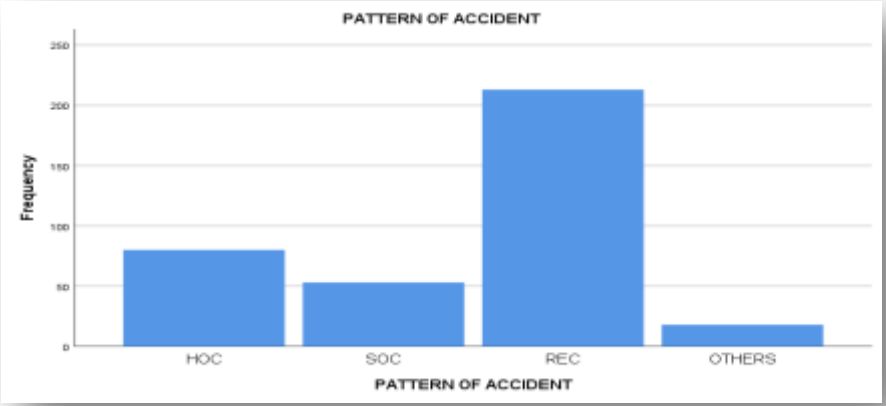
Source: First Information Report (FIR) from National Highway (48) Police Stations by Field Survey.

Table No. 1.4 Analysis of Pattern of accident

It is being observed from the secondary data that the accidents are taking place in the same pattern. So, in order to reduce number of accidents on National highway 48, it is necessary to analyse the pattern of accident among the vehicles. Hence the pattern of accidents are analysed on various aspects like Head on Collision, Side on Collision, Rear End Collision and other.

Analysis of Pattern of accident			
Pattern of accident	**Frequency**	**Percent**	**Cumulative Percent**
Head On Collision	80	22.0	22.0
Side On Collision	53	14.6	36.5
Rear End Collision	213	58.5	95.1
Others	18	4.9	100.0
Total	364	100.0	

Graph No. 4.2



From the above table and diagram it is clear that the maximum number of accident pattern is Rear End Collision which is 58.5% which is followed by Head on Collision i.e. 22.0% and Side on Collision is

showing second least percentage i.e. 14.6 and Other pattern of accidents are of just 4.9%.

As Indian National Highways have bad history of accidents, Indian traffic management system is improving their services to reduce the number of fatalities. To reduce the number of fatal accidents and injured accidents, the researcher tries to find out the pattern of accident by which the fatalities are increasing. The pattern of accidents are such where the youngers are loosing their lives are Rear End Collision (RER), Side On Collision (SOC), Head on Collision (HOC) and Other patterns of accidents.

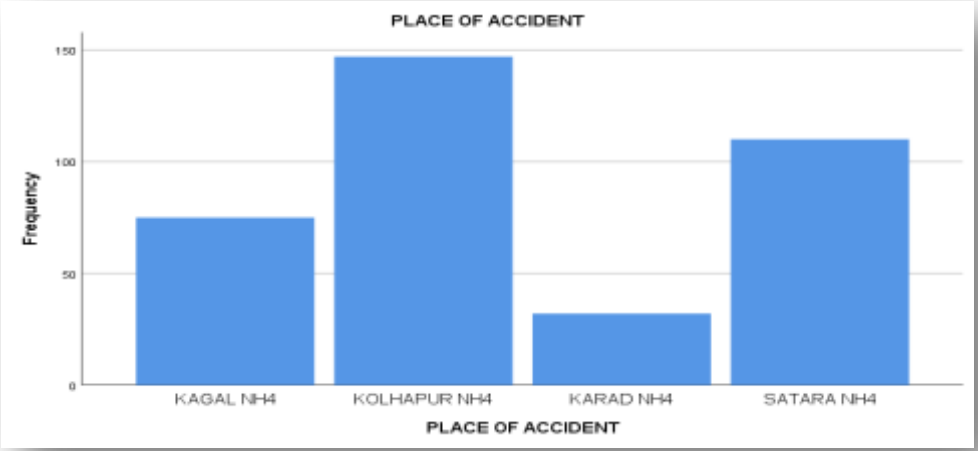
Table No. 1.5 Analysis of Place of accident

As per the geographical area selected for research study, it consist of the area from Pune to Kagal. So, in order to collect the data conveniently the selected geographical area is divided in four parts likely Kagal, Kolhapur, Karad and Satara. To analyse the place of accident on NH4 (48) researcher collected the data from the Highway police station as per the calculated samples. Analysis of place of accidents will help the management to impart over there extra force to curb growing number of accidents.

Analysis of Place of Accident			
Stretch of NH48	**Frequency**	**Percent**	**Cumulative Percent**
Kagal NH 48	75	20.6	20.6
Kolhapur NH 48	147	40.4	61.0
Karad NH 48	32	8.8	69.8
Satara NH 48	110	30.2	100.0
Total	364	100.0	

Source: First Information Report (FIR) from National Highway (48) Police Stations by Field Survey.

Graph No. 4.3



The above table and diagram depicts that 40.4% of the accidents have taken place in the area of Kolhapur National Highway and second largest accident taken place at Satara National Highway i.e. 30.2%. Similarly 20.6% of accidents were taken place in the area of Kagal National Highway whereas 8.8% of the accidents taken place on Karad National Highway.

It is observed that every national highway have a specific place where there is history accidents were recorded. On NH4 (48) there are many specific places where the accidents are taking place mostly the stretch under study at Kolhapur and Satara.

Table No. 1.6 Analysis of Unnecessarily Vehicles Are Being Stopped

ANALYSIS OF UNNECESSARILY VEHICLES ARE BEING STOPPED			
Ratings	**Frequency**	**Percent**	**Cumulative Percent**
1. Strongly Agree	207	66.6	66.6
2. Agree	47	15.1	81.7
3. Neutral	04	1.3	83.0
4. Disagree	07	2.3	85.2
5. Strongly Disagree	46	14.8	100.0
Total	311	100.0	

Vehicle drivers are unnecessarily stopped even all document are shown to them. Actually vehicle drives have complaint about this behaviour of the traffic police and maximum respondents are strongly agree with this view. 15.1% of them are agree with it whereas 14.8% of the respondent are strongly

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disagree with the statement and very negligible percentage i.e. 1.3 of the respondent are neutral and 2.3% of them are disagree with the statement that they are unnecessarily stopped on NH4 (48).

Table No. 1.7 Analysis of Weaknesses in Traffic Management System

ANALYSIS OF WEAKNESSES IN TRAFFIC MANAGEMENT SYSTEM			
Ratings	**Frequency**	**Percent**	**Cumulative Percent**
1. Strongly Agree	140	45.0	45.0
2. Agree	34	10.9	55.9
3. Neutral	44	14.1	70.1
4. Disagree	43	13.8	83.9
5. Strongly Disagree	50	16.1	100.0
Total	311	100.0	

The above table depicts the responses given by the respondents on weaknesses in traffic management system where 45% of the respondents are strongly agree and 10.9% of them also agree that there are weaknesses in traffic management system where as 16.1% of the respondent said that traffic management services are going smoothly and it need no more improvements. 14.1% are neutral about the statement and 13.85 of them are disagree with the statement.

Table No. 1.8 Analysis of Corrupt Less Traffic Management System

ANALYSIS OF CORRUPT LESS TRAFFIC MANAGEMENT SYSTEM			
Ratings	**Frequency**	**Percent**	**Cumulative Percent**
1. Strongly Agree	82	26.4	26.4
2. Agree	15	4.8	31.2
3. Neutral	06	1.9	33.1
4. Disagree	11	3.5	36.7
5. Strongly Disagree	197	63.3	100
Total	311	100.0	

The above table and diagram explains that 63.3% of the respondents are strongly disagree that traffic management system is corruptness and 26.4% of the respondents are strongly agree that there is no corruption in traffic management system whereas 3.5% of the respondent are also not supporting the statement and 1.95 of them are neutral about it.

Hypotheses Testing By Chi-Square Test

H0: Location of accident and pattern of accident is independent.

The above table depicts that location of accident and pattern of accident is independent variable.

In order to analyse the pattern of accident and place of accident, researcher has used the FIR (First Information Report) from various highway adjoined police stations in a selected stretch of NH4 (48). To test hypothesis from the variables researcher have taken the data from (Q. No. 5) Location of accident which includes 1) Kagal NH48 2) Kolhapur NH48 3) Karad NH48 4) Satara NH48 and (Q. No. 4) Pattern of accident includes 1) Head on collision 2) Side collision 3) Mishaps 4) Rear-end-collision from SET I Content Analysis regarding accidents on NH4 (48).

I) Hypothesis I

Table No. 4.128 Location of accident and pattern of accident is independent.

Chi-Square Tests			
	Value	**df**	**Asymptotic Significance (2-sided)**
Pearson Chi-Square	11.627[a]	9	.235
Likelihood Ratio	12.429	9	.190
Linear-by-Linear Association	2.384	1	.123
N. of Valid Cases	364		

a. 3 cells (18.8%) have expected count less than 5. The minimum expected count is 1.58.

Source: SPSS output

Table No. 4.128 showing the value of Chi –Square statistic value is 11.627[a] and Pearson Chi-Square value is .235 appearing in the same row in the "Asymptotic Significance (2 sided)" column. In this case the P-value is greater than alpha value. So, the null hypothesis that shows two variables are independent of each other is accepted. The data suggested that the variable i.e. Pattern of accident and Place of accident is associated with each other.

II) Hypothesis II

H0: Reason of accident and pattern is independent.

The above statement shows Reason behind accident and pattern of accident is independent variable.

To test the hypothesis by Chi-Square test between these two variables researcher have taken the data from Set I Content Analysis regarding accidents on NH4 (48) from the Highway Police station reports

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which is collected from field survey on NH4 (48) in a particular selected area of NH4 (48).To analyse the variables relation data of (Q No. 4) i.e. Pattern of accident and Reasons of accident (Q No. 8) 1) Head on collision 2) Side collision 3) Mishaps 4) Rear-end-collision which includes 1) Over speeding 2) Drunk and drive 3) Use of mobile phones while driving 4) Avoiding safety measures 5) wrongly overtaking 6) Others respectively.

Table No. 1.8 Reason of accident and pattern is independent.

Chi-Square Tests			
	Value	**df**	**Asymptotic Significance (2-sided)**
Pearson Chi-Square	80.397[a]	6	.000
Likelihood Ratio	63.596	6	.000
Linear-by-Linear Association	2.905	1	.088
N. of Valid Cases	364		

a. 1 cells (8.3%) have expected count less than 5. The minimum expected count is 2.42.
b. Source: SPSS output

The above table shows Pearson Chi- Square Statistic value is 80.397[a] and the Pearson Value is . 000 appearing in the same row in the "Asymptotic Significance (2 sided)" column. In this case the P-Value is smaller than the standard alpha value. So, the null hypothesis that depicts two variables are independent of each other is rejected. The data suggests that the variables i.e. Reason of accident and Pattern of accident are associated with each other.

Findings

- It is also found that maximum traffic police are accepting bribes on violation of traffic rule but they even not trying remain honest in duty hours and they are for protection of people driving on public road. This corrupt behaviour of traffic police is not discouraging people from violation of rules against which people started disrespecting traffic police, its ultimate consequence is continuation of violation of traffic rules and losing lives of the young peoples.
- It can be conclude that though penalty is not charged to collect revenue but increasing corruption by traffic police is also affecting the revenue for economic development.
- As per the secondary data crores of rupees are collected in one day in Maharashtra just by special drive raid, then it can be imagined that what would be the amount which is bribed by traffic police every day in a month and subsequently in a year.
- No any emergency call box identified by the researcher on the national Highway 48 taken under study also no any variable message sign board have been seen by researcher a particular stretch of the National Highway 48.
- No any digital board has been noticed in the stretch selected under study only the painted boards have been seen but no any digital speed limit, route showing variable board have been noticed and the stretch of National Highway selected in a study from Kagal to Pune but in between it is found that not a single traffic signal poll is located to manage traffic or to curb speed limit.

✓
✓
✓ **Suggestions On Observed Findings**

- It is suggested that traffic police should be strictly warned by upper authority on collection of bribes and note should be taken that no any illegal practice takes place. It is also suggested that, the located cameras should also be used to capture the crime done by traffic police themselves likewise where the cameras are used to capture offensable crime of drivers plying on highways and roads and Traffic Management System should conduct a programme of "Traffic Awareness" where the lay man can get aware about traffic rules and mandatory documents to carry while driving.
- There should be one day in a week of 'No vehicle day' as like made in metro cities like Mumbai 'Mega Block'and should be one fixed day in a week as 'Special Drive' on roads and highways to catch drivers if violating traffic rules and non-availability of documents. This will make habitual to public to carry traffic rules and that day every traffic police must be ordered to collect full charges of violation of traffic rules. This will increase revenue of the Government, decrease corruption among police authority and other people will get lesson by paying full charges of penalty.

Conclusion

Traffic management System is improving their service for vehicle drivers for smooth flow of traffic and also made many changes in existing traffic management system like changes in penalty which has increased than earlier, promoted existing traffic rules and introduction of new rules etc. but the corruption in Traffic Management System is exceeding their responsibility towards their work. It is observed that the rule breaker is Traffic police authority themselves and then it is broke by public.

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Apart from this public should also be aware about their moral responsibilities but if public follows the same trend to violate traffic rules, it would collapse the entire system. As it is the phenomenon to achieve unitedly.

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