

Comparison of RASSI Database and National Road Accident Statistics of India

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I. INTRODUCTION

Road Accident Sampling System India (RASSI) [1] collects accident data on Indian roads to aid national traffic planning, and also allow engineers to analyse vehicle accidents and injury patterns. RASSI covers six sampling locations (Coimbatore, Raigad, Pune, Ahmedabad, Gandhinagar and Kolkata), which accounts for total sampling road length of approximately 870 km, against 4,865,394 km [2] nationally. To understand how representative RASSI is for India, it is necessary to compare RASSI data to national data [3].

II. METHODS

This study focuses on the similarities and differences between RASSI data collected during April 2014 – March 2015 (407 accidents) and national data collected during the calendar year 2014 (489,400 accidents) by considering parameters such as age, time, location, road users, accident severity, etc. RASSI is an in-depth database that collects its cases via on-site accident teams. It has two basic accident selection criteria: 1. accident must involve at least one motorised vehicle; 2. crash spot must be on a public road within the study area [1]. The exception is Kolkata, where, in addition to basic selection criteria, the highest accident severity must be fatal. Statistical tests were performed using Chi-square tests with a confidence level of 95%.

III. INITIAL FINDINGS

Of 407 accidents in RASSI, 683 vehicles were involved, with 1,290 occupants (179 fatal, 637 injured, 474 no injury) and 38 pedestrians (20 fatal, 18 injured) as victims. Nationally, 489,400 accidents were recorded, with 633,145 victims (139,671 fatal, 493,474 injured). Injury severity is shown in Fig. 1.

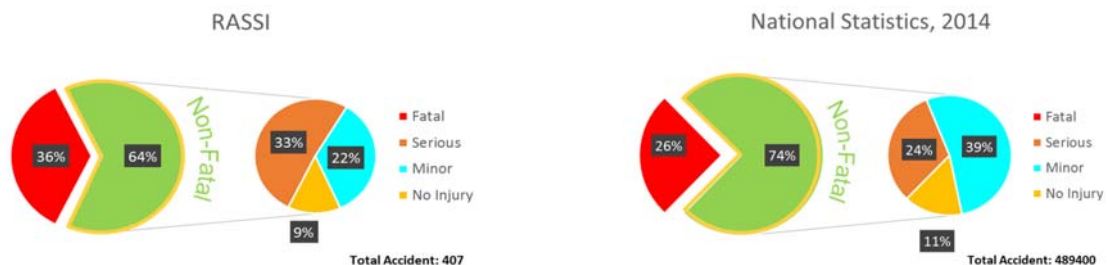


Fig. 1. Comparison of accident severity (fatal, serious, minor, and no injury).

Accidents during daytime (06:00 to 17:59) were 67% (274) in RASSI and 60% (292,407) nationally of the total number of accidents, respectively. No data for seatbelt and helmet usage was found nationally. According to WHO [4], however, estimated seatbelt and helmet-wearing rates for drivers were 27% and 50% respectively. As per RASSI, seatbelt and helmet-wearing rates for drivers were 27% and 10% respectively.

Fatalities among VRUs (Vulnerable Road Users) in RASSI was 40%, and in national data it was 41% (Fig. 2). Ages for all fatalities were divided among four categories, such as <15, 15–44, 45–64, 65+, after excluding unknowns (45 RASSI, 3,814 nationally). Major fatalities (98,954) were found to occur in the 15–44 years age group (73%) nationally; for the same group in RASSI it was 63% (97) (Fig. 3). More persons are involved in accidents in rural locations compared to urban, and this difference is higher for RASSI (Fig. 4).

Statistical tests showed that RASSI recorded a significantly higher proportion of non-fatal, daytime and rural accidents, as compared to national data. In terms of fatalities, RASSI recorded a significantly higher proportion of cars, and a smaller proportion of trucks and buses. Motorised two-wheelers, pedestrians and the other categories

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showed no statistical difference. Regarding age differences, RASSI had a significantly smaller share of 15–44 years and a larger share of 45–64 and 65+ years of age compared to the national data (Fig. 3).



Fig. 2. Comparison of fatal road users involved in accidents.



Fig. 3. Age distribution for fatal occupants (excl. unknown).



Fig. 4. Victims as per crash location.

IV. DISCUSSION

This study investigated the differences between the RASSI database and Indian national data. We searched for comparable variables available in the two databases, and both similarities and differences were identified. One reason for such differences could be variations in road type distribution. India consists of various road categories, such as NH (National Highways), SH (State Highways), OPWD roads (Other public works departments), project roads, etc. [2] and when considering accidents nationally, except for NH and SH, all other roads are categorised as Other Roads. Nationally, 47% of accidents were recorded in Other Roads [3]. RASSI sampling locations differ between the sampling areas, for example: Coimbatore – NH and SH; Pune and Raigad – NH and Other Roads; Ahmedabad and Gandhinagar – NH, SH and Other Roads; Kolkata – Other Roads. In RASSI, 49% of accidents were categorized as Other Roads. Inclusion criteria could be another factor in the difference in accident severity between RASSI and national data (Fig. 1), as Kolkata includes only fatal accidents in its database.

There are some interesting variables which due to difference in parameters, cannot be compared, such as junction type and crash configuration. RASSI has information on whether the crash was a head-on, rollover, pedestrian, etc., but such detail were not available from the national data.

To conclude, RASSI had notably larger shares of rural and non-fatal accidents, as well as a higher involvement of cars, compared to the national data. However, involvement of motorised two-wheelers and pedestrians showed similar rates.

V. REFERENCES

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