ROAD TRAFFIC CRASH DATA Management systems: National Data & International Best practices

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Traffic crash data recording and reporting process in India (Police data)

Traffic Accident recording

Traffic Crash → Information received at the Police station
Visit to the site, daily diary entry

FIR filed → Manual
Electronic/CCTNS

Case file prepared

Investigation for the court

Site plan
Vehicle Inspection
Post-mortem

Court/MACT

Traffic Accident Reporting

NCRB → SCRIB
DCRB 13 tables

MoRT(H(TRW)) → State PWD
PWD District level, 17 tables
Reporting by public agencies

- National Crime Records Bureau and Ministry of Road Transport and Highways publish annual reports with road traffic statistics.
- National and State level aggregate statistics of road crashes.
- Useful for general trends and comparison across cities (selected) or states.
- There is a need for crash-level information to do detailed analysis.
- Available online on NCRB and MORTH websites.
Data discrepancy
Proportion of road traffic fatalities by road user type in 6 Indian cities (IITD study) vs NCRB

<table>
<thead>
<tr>
<th>City</th>
<th>Per cent pedestrian fatalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agra</td>
<td>0</td>
</tr>
<tr>
<td>Amritsar</td>
<td>0</td>
</tr>
<tr>
<td>Bhopal</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Delhi</td>
<td>5</td>
</tr>
<tr>
<td>Ludhiana</td>
<td>3</td>
</tr>
<tr>
<td>Mumbai</td>
<td>10</td>
</tr>
<tr>
<td>Vadodara</td>
<td>6</td>
</tr>
<tr>
<td>Vishakhapatnam</td>
<td>17</td>
</tr>
</tbody>
</table>

Proportion of pedestrian fatalities NCRB (2015)
Safety outcomes and their limitations

In road safety publications, three outcomes are often reported:

1. Accidents
2. Injury accidents and number of people injured
3. Fatal accidents and number of people who died

• Accidents may include all road crashes, including injury and fatal. Since injury accidents are highly underreported, number of accidents as well as injury accidents reported by NCRB or MORTH are unreliable.

• Injury accidents could be less than or equal to number of people injured.

• Similarly, fatal accidents could be less than or equal to number of people who died, as a single accident may have more than one victim.
Accuracy of Police data?

- Fatalities ~ 5% under reported compared to hospital data
- Injury RTCs 15-20 times under reported
- Large variation between health ministry death registrations and police data
Shortcomings of police data

• National level tables (NCRB and MoRTH) for victims are based on “road user causing the accident, therefore pedestrians and bicyclists numbers are incorrect (lower than actual numbers)

• Location is available in the case file, not marked on the map for analysis and remedial measures
Levels of data collection for safety standards/policies

- **Base**
  - Police Data, Traffic police

- **Intermediate**
  - Traffic Data, Injury coding, **specialists practioners**

- **In-depth multidisciplinary causative**
  - Crash reconstruction Specialists researchers
  - Vehicle design standards, road furniture design, crash barriers
  - traffic management strategies, road designs (cross sections)
  - Epidemiology of fatal crashes, fixing priorities
The analyses of primary level data is expected to accomplish the following important functions:

1. To give perspective view of the RTC situation in terms of who is involved (the type of road user) where (Urban or rural area, road layout), when (day or night) and under what circumstances.

2. To enable trends to be examined, and provide a basis for comparison against which road safety workers may match their performance, either within or between state or national administrations.

3. To provide a basis for establishing priorities for action.
Past Efforts for improving RTC recording


- **Electronic recording**
Comprehensive format covers

• Format for recording road accident data by the Police at accident site covers the following:
  i. Accident identification details
  ii. Road related details
  iii. Vehicles involved in accident
  iv. Drivers details &
  v. Persons other than drivers involved in accident

New details
Simplified definitions
GPS details for location
Use of safety devises
Identification of impacting vehicle
Shortcomings of police data

• National level tables (NCRB) for victims are based on “road user causing the accident, therefore pedestrians and bicyclists numbers are incorrect (lower than actual numbers)

• Location is available in the case file, not marked on the map for analysis and remedial measures

• IPC 279,304A,336,337,338 and MVA sec.185,184 is used for RTAs. CRPC 174 for single vehicle crashes or no one to “blame” are not counted towards road traffic crash.
Data recording process in RADMS, Tamilnadu
Collaboration between Police, RTO, PWD.NHAI

Operating the System

1. Accident Occurrence
2. Manual FIR Recording
3. Data logging in System
4. Server at STPC
5. Data Entry by Transport Dept.

Data Entry by Highway Dept.
RADMS Evaluation

• Location of crashes identified

• Total number of deaths in RTAs differs depending on – Drivers, passengers, pedestrians

• Type of Impacting vehicle in collision can not be extracted

• Victim vs impacting vehicle matrix cannot be made
## Shortcomings in current recording and reporting process

<table>
<thead>
<tr>
<th>Index</th>
<th>Description of current shortcomings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Traffic crash reported under IPC(against an accuser), Minor injury and vehicle damage crashes usually not reported, many single vehicle crashes reported under CR Pc 174</td>
</tr>
<tr>
<td>2</td>
<td>Standardised format usually not followed, alcohol presence, use of helmets, seat belts, road details, chainage, speed and traffic information, victim age, not filled</td>
</tr>
<tr>
<td>3</td>
<td>CCTNS is under implementation, traffic crash related items cannot be filled in the current form.</td>
</tr>
<tr>
<td>4</td>
<td>Location details are often unclear, vehicle inspection report is to meet the insurance requirement, post mortem report does not have standardised injury codes</td>
</tr>
</tbody>
</table>
Shortcomings in current recording and reporting process

Index | Description of current shortcomings
---|---
1 | Case file does not include details which are not admissible in the court.
2 | 13 tables prepared manually, victim type based on accused vehicle
3 | 17 tables prepared manually, many details reported which are not recorded regularly, victim type based on accused vehicle
International Best Practices
Fatality Analysis Reporting System (FARS), USA since 1975

- FARS was created by National Highway Traffic Safety Administration (NHTSA) in 1975, and maintained by National Center for Statistics and Analysis (NCSA).
- It provides data about fatal crashes involving all types of vehicles. It is used to identify highway safety problem areas, provide a basis for regulatory and consumer information initiatives, and forms the basis for cost and benefit analyses of highway safety initiatives.
- It is a census of fatal motor vehicle crashes with a set of data files documenting all qualifying fatalities that occurred within the 50 States, the District of Columbia, and Puerto Rico since 1975.
Important features of FARS

• **Data Sharing Cooperative Agreement with States**
  
  NHTSA has a *cooperative agreement* with an agency in each State’s government to provide information on *all qualifying fatal crashes* in the State. These agreements are managed by NCSA's FARS Program staff. Trained State employees, called “FARS Analysts,” are responsible for gathering, translating, and transmitting their State’s data to NCSA in a standard format.

• **Crash Inclusion Criteria in the FARS database**
  
  A crash had to involve a motor vehicle traveling on a trafficway customarily open to the public, and must have resulted in the death of a motorist or a non-motorist within 30 days of the crash.

• **Input Data for FARS Database**
  
  FARS data are obtained from various States’ documents, minimum data specified
Traffic Accident Analysis System, South Korea

TAAS
Traffic Accident Analysis System

- Integrating all accident data from each organisation.
- Providing the accident input & management system on the basis of standard format.
- Managing and standardising input management system.
- Unification of channel of providing road accident data by the police.
- Sharing the accident data based on geographic information system (GIS) and the accident analysis data.
Swedish Traffic Accident Data Acquisition (STRADA)

• STRADA (Swedish Traffic Accident Data Acquisition) is a national information system containing data on traffic accidents and injuries occurring in the Swedish road transport system.

• The data in STRADA is based on two separate sources: traffic accident reports provided by the police, and medical reports provided by the hospitals that are part of the STRADA system.

• The Swedish Transport Agency is the authority responsible for STRADA. Nationwide reporting to STRADA by the police has been carried out continuously since 2003 (early trials of the system began in 1999). Hospital reporting to STRADA has increased gradually from 29 hospitals in 2003 to 68 hospitals in 2012.
Australian Road Deaths Database (ARRD)

• The Australian Road Deaths Database provides basic details of road transport crash fatalities in Australia as reported by the police each month to the State and Territory road safety authorities. It is published by the Bureau of Infrastructure, Transport and Regional Economics.

• The Australian Road Deaths Database (ARDD) is maintained and published by BITRE (Bureau of Infrastructure, Transport and Regional Economics). It commenced in 1989 and is updated on a monthly basis.
Lessons from International best practices III

• Specialised institutions are able to create accurate and reliable data useful for various levels of policy making.

• Often police data is linked with hospital data base and other reliable sources like census to complete the required data. This requires employing specialists. This is difficult for all police reported crashes.

• Selected crashes are studied in more detail by specialists.

• National levels institutions have been funded by the national governments to create data on fatal crashes and made publicly available for researchers. This improves the usefulness and accuracy of data.
iRAD – Integrated Road Accident Database / eDAR – e-Detailed Accident Report

The Integrated Road Accident Database (iRAD) Project is an initiative of the Ministry of Road Transport and Highways (MoRTH), Government of India and is funded by World Bank, with objective to improve road safety in the country.
## Road safety indicators

<table>
<thead>
<tr>
<th>Index</th>
<th>Description</th>
<th>Use and limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of injuries</td>
<td>Absolute figure indicating the number of people injured in road traffic crashes</td>
<td>Useful for planning at the local level for emergency medical services</td>
</tr>
<tr>
<td></td>
<td>Injuries sustained may be serious or slight</td>
<td>Useful for calculating the cost of medical care</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not very useful for making comparisons</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A large proportion of slight injuries are not reported</td>
</tr>
<tr>
<td>Number of deaths</td>
<td>Absolute figure indicating the number of people who die as a result of a road traffic crash</td>
<td>Gives a partial estimate of the magnitude of the road traffic injury problem, in terms of deaths</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Useful for planning at the local level for emergency medical services</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not very useful for making comparisons</td>
</tr>
<tr>
<td>Fatalities per 10 000 vehicles</td>
<td>Relative figure showing ratio of fatalities to motor vehicles</td>
<td>Shows the probability vehicle inrolment in fatal crashes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A limited measure for assessing safety in a society because it omits non-motorized transport and other indicators of exposure. Usually declines with motorization</td>
</tr>
<tr>
<td>Fatalities per 100 000 population</td>
<td>Relative figure showing ratio of fatalities to population</td>
<td>Shows the impact of road traffic crashes on human population as a public health problem</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Useful for comparing road traffic injuries as a health problem in different communities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Useful for estimating severity of crashes</td>
</tr>
<tr>
<td>Fatalities per vehicle-kilometre travelled</td>
<td>Number of road deaths per billion kilometres travelled</td>
<td>Useful for some international comparisons, decreases with motorization</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Does not take into account non-motorized travel</td>
</tr>
</tbody>
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