A Comparison of Road Crash Reporting in High-, Middle-, and Low-income Countries: Global Perspectives

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Presentation Structure

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Introduction | The Role of Crash Data in Road Safety

- Quality of road safety improvement is highly dependent upon the quality of the respective data on which improvements are based

- *Global Plan for the Second Decade of Action for Road Safety* recognizes the overall importance of improved quality, harmonization, and comparability of road safety data at all levels

- Police reported crash data is and will likely remain the primary source of road safety data

Study objectives

- To synthesize and compare road crash reports from various countries, internationally to further efforts of improving road crash reporting and subsequently the quality of road crash data in both HICs and LMIC

- To draw comparisons between crash reports from 25 high-income, and low- and middle-income countries internationally, based on the police crash reported variables

- Produce actionable recommendations for improvement of crash reporting in high-income and low- and middle-income countries

Police Crash Report Regions and Collection

- 25 police crash reports total were collected
  - Crash reports and relevant information to reporting were obtained by professional contacts in their respective countries

- From HICs crash reports are collected for 12 countries (Austria, England, Germany, Italy, North Ireland, Portugal, Scotland, Spain, Sweden, Switzerland, United States, and Wales)
  - England, North Ireland, Scotland, and Wales use a singular form (STAT19)
  - 3 separate reports were collected from states of Austria
  - 5 separate reports were collected from states of the United States of America

- From LMICs crash reports are collected for 13 countries (Bangladesh, Colombia, Ghana, India, Malaysia, Namibia, Nigeria, Philippines, Russia, Tanzania, Thailand, Uganda, and Zambia)

Crash Reporting in High-income, Middle, and Low-income Countries

High-income country crash reporting

- Defined by minimum standard set of data variables
  - European Union | Common Accident Data Set (CADaS)
  - United States| Model Minimum Uniform Crash Criteria (MMUCC)
- Developed disaggregated datasets
  - At the US and EU level
  - e.g., Fatality Analysis Reporting System (FARS)

Low- and middle-income country crash reporting

- Police reported data is the most complete source of crash information
- No minimum standard set of data variables exists at a high level
- Variable coverage is generally poor
- Lack of consistency in variable coding practices
- Use of non-standardized definitions of road traffic injury

Comparison of Crash-related Information

Crash location

- Provides opportunity for data linkages
- HICs benefit more from GIS and GPS systems than LMICs presently
- It is common for reports to contain multiple measures for location
- Crash data without use for GIS or GPS may benefit from the use of location rectifications methods

Crash type, contributor, & event

- HICs tend to report some combination of related information
- Crash type is consistently reported in HICs and LMICs
- CADaS does not recommend reporting events information
- EU countries tend not to report event information the US does
- LMIC's crash reports lack event related information

Crash severity

- Other than fatal crashes, there exists few commonly agreed-upon definitions for injury severity
- The US uses the KABCO injury severity scale
- EU countries use the Abbreviated Injury Scale (AIS)
- Severity definitions vary widely among all countries, though the most among LMICs

Comparison of Crash-related Information

Table 1. Sample table from the high-income country crash-related variable table

Variables	Country										
		Austria		United Kingdom	Portugal	Switzerland	United Sates				
State	Burgenland	Carinthia	Lower Austria				Texas	Arizona	Georgia	Louisiana	Oregon
Crash Characteristics											
Crash location	Precise as possible	Precise as possible	Precise as possible	Highway name and linear referencing, address for urban roads	Highway name and linear referencing, GPS-GIS coordinates	Highway name and linear referencing, GPS-GIS coordinates	Highway name and linear referencing, GPS-GIS coordinates				
Crash narrative	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Crash type	No	No	No	No	17 descriptors	Description	22 descriptors	10 descriptors	Description	18 descriptors	7 descriptors
First harmful event	No	No	No	Non-Collision (13), Collision with Object (21) descriptors	16 descriptors	Collision with Fixed Object (11), Collision with Non-Fixed Object (3) descriptors	No	Non-Collision (15), Collision with Fixed Object (12), Collision with Non-Fixed Object (9) descriptors	Description	Non-Collision (8), Collision with Fixed Object (12), Collision with Non-Fixed Object (22) descriptors	Non-Collision (6), Collision with Fixed Object (26), Collision with Non-Fixed Object (8) descriptors
Sequence of events	No	No	No	Yes	No	No	Yes	Yes	Yes	Yes	No
Contributing circumstance	No	No	No	78 descriptors	No	Description	80 descriptors	Environmental (2), Motor vehicle (3), Road (6) descriptors	Description	13 descriptors	No
Hit and run	No	No	No	3 descriptors	Yes	No	Yes	Yes	Yes	3 descriptors	Yes, Driver details
Definition of nonfatal injury level	Description	Description	Description	Serious injury, Slight injury	Serious injuries, Minor injuries	Life-threatening injury, significantly injured,	A: Suspected serious injury B: Suspected minor injury	A: Suspected serious injury B: Suspected minor injury C: Possible injury	A: Suspected serious injury B: Suspected minor injury	A: Suspected serious injury B: Suspected minor injury C: Possible injury	A: Suspected serious injury B: Suspected minor

Table 2. Sample table from the low- and middle-income country crash-related variable table

Variables	Country									
	Bangladesh	Colombia	Ghana	India	Malaysia	Namibia	Nigeria	Philippines	Thailand	Uganda
Crash Characteristics										
Crash location	Highway name and linear referencing, GPS coordinates	Highway name, address for urban roads, GPS coordinates	Highway name and linear referencing, GPS coordinates	Highway name and linear referencing, GPS coordinates	Highway name and linear referencing, address for urban roads	Highway name and linear referencing, GPS coordinates	Highway name, GPS coordinates	Highway name and linear referencing	Highway name, address for urban roads	Highway name and linear referencing, GPS coordinates
Crash narrative	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	No
Crash type	11 descriptors	6 descriptors	11 descriptors	12 descriptors	13 descriptors	18 descriptors	11 descriptors	11 descriptors	7 descriptors	8 descriptors
First harmful event	No	No	No	No	No	No	No	No	No	No
Sequence of events	No	No	No	No	No	No	No	No	No	No
Contributing circumstance	18 descriptors	Description	No	No	11 descriptors	No	4 descriptors	4 descriptors	19 descriptors	18 descriptors
Hit and run	No	No	Yes	Yes	Yes	No	No	Yes	No	No
Definition of nonfatal injury level	Grievous injury, Simple injury	With injury	Hospitalized, Injured not-hospitalized	Hospitalized, Injured not-hospitalized	Severe injury, Light injury	Serious injury, Slight injury	Serious injury, Slight injury	Serious injury, Minor injury	Injured	Serious injury, Minor injury

Comparison of Roadway-, Vehicle-, and Person-related Information

Roadway-related info

- Among several reports both for HICs and LMICs roadway-related information is not reported
- LMICs more consistently report roadway geometric features (i.e., grade, alignment, surface type, and condition)
- Likely this is due to LMICs lacking road inventory data
- Work zone and speed relation are rarely reported on in LMICs

Vehicle-related info

- Make, model, and year are commonly reported among HICs
- LMICs tend rather to report vehicle body type more consistently
- HICs report high resolution insurance information creating more utility for crash data
- There is a general lack of vehicle-related information include in both HICs and LMICs

Person-related info

- Typical segmented into driver elements and other involved person elements
- Some EU countries only report on driver information
- Some LMICs report differing injury definitions for drivers and other involved persons
- LMICs and EU countries do not report airbag deployment
- LMICs tend not to report alcohol and drug tests or results

Comparison of Roadway-, Vehicle-, and Person-related Information

Table 3. Sample table from the high-income country roadway-, vehicle-, and person-related variable table

Variables	Country										
	Austria			United Kingdom	Portugal	Switzerland	United Sates				
State	Burgenland	Carinthia	Lower Austria				Texas	Arizona	Georgia	Louisiana	Oregon
Roadway Attributes											
Roadway grade	No	No	No	No	3 descriptors	No	8 descriptors	4 descriptors	No	5 descriptors	4 descriptors
Roadway alignment	No	No	No	No	2 descriptors	No	8 descriptors	4 descriptors	No	3 descriptors	4 descriptors
Surface type	No	No	No	Yes	4 descriptors	No	No	No	No	11 descriptors	5 descriptors
Surface condition	Yes	No	No	5 descriptors	11 descriptors	6 descriptors	9 descriptors	9 descriptors	No	10 descriptors	10 descriptors
Vehicle Attributes											
Make	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Model	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Model year	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle body Type	Yes	Yes	Yes	20 descriptors	14 descriptors	11 descriptors	19 descriptors	Yes	Yes	30 descriptors	Yes
Personal Characteristics											
Injury status	Yes	No	No	3 descriptors	4 descriptors	7 descriptors			5 descriptors		
Driver license status	Yes	No	No	No	6 descriptors	10 descriptors	No	Yes	No	7 descriptors	7 descriptors
Seating position	No	No	No	3 descriptors	3 descriptors	3 descriptors	18 descriptors	20 descriptors	Yes	31 descriptors	7 descriptors
Air bag deployed	No	No	No	No	No	No	7 descriptors	8 descriptors	Yes	8 descriptors	2 descriptors
Suspected alcohol use/test	Yes	No	No	4 descriptors	Yes	Yes	Yes	Yes	No	3 descriptors	No
Suspected drug use/test	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	3 descriptors	Yes

Table 4. Sample table from the low- and middle-income country roadway-, vehicle-, and person-related variable table

Variables	Country									
	Bangladesh	Colombia	Ghana	India	Malaysia	Namibia	Nigeria	Philippines	Thailand	Uganda
Roadway Attributes										
Roadway grade	5 descriptors	No	5 descriptors	2 descriptors	2 descriptors	2 descriptors	No	4 descriptors	No	No
Roadway alignment	5 descriptors	Yes	5 descriptors	2 descriptors	2 descriptors	3 descriptors	No	4 descriptors	3 descriptors	5 descriptors
Surface type	3 descriptors	4 descriptors	6 descriptors	2 descriptors	5 descriptors	No	No	4 descriptors	3 descriptors	No
Surface condition	5 descriptors	12 descriptors	3 descriptors	No	6 descriptors	9 descriptors	No	No	4 descriptors	No
Vehicle Attributes										
Make	Yes	Yes	No	No	Yes	No	No	Yes	Yes	No
Model	No	Yes	No	No	Yes	No	Yes	Yes	Yes	No
Model year	No	No	No	Yes	Yes	Yes	No	Yes	Yes	No
Vehicle body type	19 descriptors	18 descriptors	12 descriptors	13 descriptors	20 descriptors	21 descriptors	15 descriptors	12 descriptors	19 descriptors	12 descriptors
Insurance	2 descriptors	Yes	No	No	No	No	Yes	Yes	2 descriptors	No
Personal Characteristics										
Injury status	4 descriptors	2 descriptors	Driver (4), Others (3) descriptors	Drivers (5), Others (3) descriptors	4 descriptors	4 descriptors	3 descriptors	Driver (4), Others (3) descriptors	2 descriptors	3 descriptors
Driver license status	Yes	Yes	4 descriptors	4 descriptors	2 descriptors	Yes	4 descriptors	Yes	Yes	Yes
Seating position	3 descriptors	No	7 descriptors	No	No	Yes	4 descriptors	6 descriptors	No	No
Air bag deployed	No	No	No	No	No	No	No	No	No	No
Suspected alcohol use/test	No	Yes	Driver (5), Other (3) descriptors	3 descriptors	3 descriptors	2 descriptors	Yes	2 descriptors	3 descriptors	No
Suspected drug use/test	No	Yes	Driver (5), Other (3) descriptors	No	No	2 descriptors	Yes	2 descriptors	Yes	No

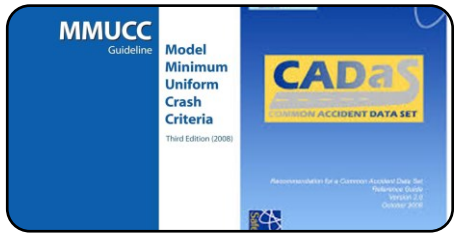
Conclusions and Prospective Areas for Improvement

Adoption of Computerized Reporting Systems

- Adoption of such systems by LMICs will allow for more timely identification of crash trends
- Systems would further reduce the likelihood of errors and allow automatic updating of the regional/national databases

Improved Geospatial Network Data for Crash Data Aid

- LMICs should develop high-quality road network as well as road inventory datasets for improved crash location and road feature information in crash reports
- HICs should standardize systems among countries



Minimum Standard Data Variables for Crash Data

- HICs should harmonize and mandate the use of minimum standard data variables among countries
- LMICs should develop region specific standard sets of variables

Thank you

Questions?

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