A Critical Review of International Road Safety Databases

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Marrakesh, 11 October 2017

Background

- The assessment of the current road safety situation and the identification of the associated factors are largely based on the **availability of reliable road safety data**.

- Road accident and casualty data are insufficient for monitoring and understanding road safety. **More data/indicators** are needed to be collected.
  - Road Accident data for accident prevalence
  - Risk Exposure data for accident characteristics
  - Road Safety Performance Indicators for accident causes

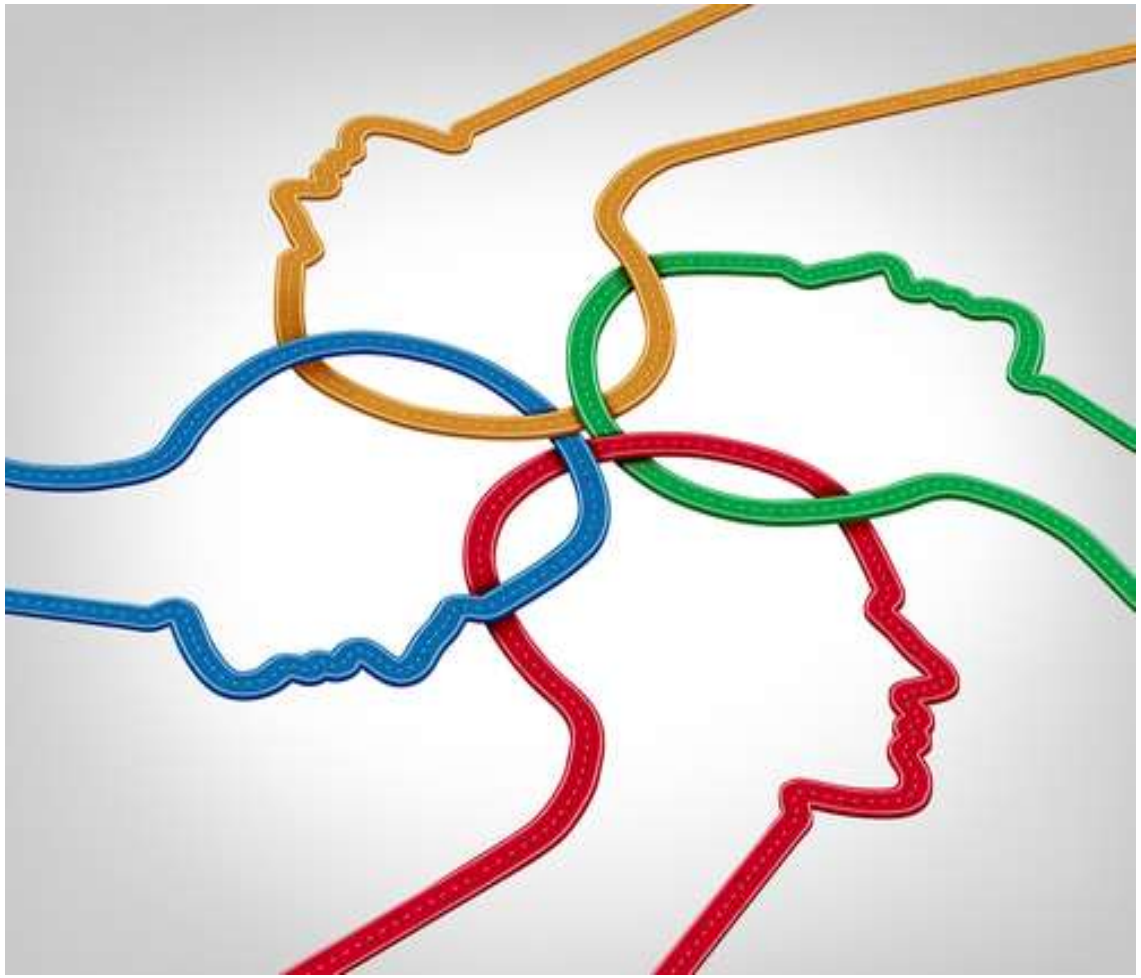
- **International road safety related databases** have made progress into this direction.

Hierarchical road safety analysis (Updated pyramid)

Objective - Methodology

- The **objective** of this research is to examine the availability of international databases with road safety related data and their comparative assessment.

- **International data sources** with data on:
  - road accidents
  - risk exposure
  - transport demand
  - road safety measures
  - performance indicators
  - socioeconomic and demographic statistics



International Databases

The databases explored were:

- **United Nations Database**
  - United Nations Economic Commission for Europe (UNECE)
  - United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP)
- **World Health Organisation** (WHO)
- **International Road Federation** (IRF)
- **Organisation for Economic Co-operation and Development** (OECD IRTAD)
- **European Commission** (EC CARE)

UNECE Database

- UNECE Working Party on Transport Statistics undertakes **dissemination of transport statistics** through
  - publications
  - the on-line UNECE Transport Statistics Database
- Road safety related data cover:
  - **Accidents** (number of accidents and injuries, per population, per 1000 passenger cars, by accident type, location, time, month, road user type, road condition, type of area etc.)
  - **Road traffic** (carriage of goods by road, passenger transport, motor vehicle movements)
  - **Road vehicle fleet** (number of vehicles by vehicle type, by fuel type, load capacity etc.)
  - Information on **vehicle related UN regulations** and their applications by countries.
  - **General data** for each country (area, population, GDP etc.)
- Data concern **53 countries**.

UNITED NATIONS
ECONOMIC COMMISSION FOR EUROPE

UNESCAP database

- Analyses and findings are based primarily on **data from the World Health Organization**.
- Calculations, graphs and diagrams on this webpage **have not been reviewed and verified by the Governments**.
- Road safety related data cover:
  - **Population**
  - Number of **road fatalities** and rates per population
  - Fatalities by **road user type and transport mode**
  - Existence of **speed limits** and max speed limits by area type
  - Existence of **drink-driving law**, BAC limits for drivers
  - Existence of **motorcycle helmet law**, applicability of law to all road types and engine types, helmet standards
  - Existence of **seat-belt law** and applicability to all occupants
  - Existence of **child restraint law**
  - Motorcycle **helmet wearing rates**
  - **Seat-belt wearing rates**
- Data concern **46 countries.**

United Nations
ESCAP

World Health Organization

- The **Global Health Observatory** (GHO) of WHO provides data and analyses on road safety.
- The **best estimates of WHO** are published for specific indicators, aiming for comparability across countries and time.
- Road safety related data cover:
  - **Demographic and socioeconomic statistics** (population, GNI, income level)
  - Number of **road fatalities**, fatality rates per population and distribution by road user type
  - **National legislation** (Drink-driving, Mobile phone, Seat-belt, Child restraints, Speed, Motorcycle helmet, Applicability of laws, Safety devices wearing rates)
  - **Institutional Framework** (Lead Agency, RS Strategy, Targets)
  - **Policy** (Alternative transport, Audits, Vehicle Standards)
  - **Post-crash response** (Pre-hospital care, training in emergency medicine)
- Data concern **182 countries**.

World Health Organization

International Road Federation

- **IRF** is a nongovernmental, not-for-profit organization.
- Data obtained directly from **road agencies and participating governments**.
- Through its annual reports - **World Roads Statistics (WRS)** - provides data/indicators on:
  - **Road Networks** (Length of road network and by road type, road network density, percentage of paved roads, percentage of motorways)
  - **Road Traffic** (Total traffic volume and by vehicle type)
  - **Multimodal traffic comparisons** (freight, passenger, road, rail transport)
  - **Vehicles in use** (total number of vehicles and by category, rates per population, per km of roads)
  - **Road accidents** (number of accidents, casualties, rates per population)
  - **Production, imports, first registrations and exports of motor vehicles** (mainly passenger cars)
  - **Road expenditures** (total expenditures per administrative level, per category)
- Data concern about **200 countries**.

OECD IRTAD database

- OECD has established the International **Road Traffic and Accident Database (IRTAD)**.
- Information comes directly from relevant **national data providers**.
- Data provided in a common format, based on common definitions, covering:
  - Injury **Accidents** by Road Network
  - Road **Fatalities** by Road Usage and Age, by Gender and Age or by Road Network
  - **Hospitalised Road User**s by Road Usage, Age or Road Network
  - **Accident Involvement** by Road User Type and Associated Victim Data
  - **Risk Indicators**: Fatalities, Hospitalised or Injury Accidents Related to Population or Mileage figures
  - **Population** Figures by Age Bands
  - **Vehicle Population** by Vehicle Types
  - **Network Length** Classified by Road Network
  - **Mileage** Classified by Road Network or Vehicles
  - **Passenger Mileage** by Transport Mode
  - **Seat Belt Wearing Rates** of Car Drivers by Road Network
- Data concern **55 countries**.

OECD

irtad

International Traffic Safety Data and Analysis Group

EU CARE Database

- **CARE** (Community database on Accidents on the Roads in Europe) is the European centralised database on road injury accidents.
- High level of **disaggregation**
- The database includes data on **road accidents, fatalities and injuries** aggregated by country, year and:
  - User
  - Gender
  - Transport Mode
  - Age
  - Month
- Data concern the **28 EU countries** and **4 EFTA countries**.
- The ERSO (**European Road Safety Observatory**) gathers harmonised specialist information on road safety practices and policy.

Economy and Management & Exposure

Data	Data collection				Data sources						Availability		Reliability	
Area considered	by authorities	Quest, surveys on representatives	Questionnaire surveys on users	Roadside observational survey	UN	WHO	IRF	OECD	EC	Other	OECD countries	M&LI countries	OECD countries	M&LI countries
Economy and Management														
Socioeconomic	X				X	X	X	X			X	X	X	X
Demographics	X				X	X	X	X	X		X	X	X	X
National Strategy		X				X		X	X		X	X	X	X
Road safety regulatory framework		X				X			X		X	X	X	X
Infrastructure safety management		X						X	X		X	X	X	X
Stakeholders involvement		X												
Health sector development	X									X				
Transport demand and exposure														
Transport modal split		X			X		X				X	X	X	
Road network				X			X	X		X	X			
Motorisation	X				X	X	X	X	X		X	X	X	X
Vehicle fleet characteristics	X				X	X	X				X	X	X	X
Vehicle legislation		X				X			X		X		X	
Exposure			X		X		X	X			X	X		
Driver licensing		X							X		X		X	

Measures

Data	Data collection				Data sources						Availability		Reliability	
Area considered	by authorities	Quest, surveys on representatives	Questionnaire surveys on users	Roadside observational survey	UN	WHO	IRF	OECD	EC	Other	OECD countries	M&LI countries	OECD countries	M&LI countries
Measures														
Data collection		X						X	X		X			
High risk sites		X						X			X		X	
Road safety audits		X				X		X	X		X	X	X	
Speed limits		X				X		X	X		X	X	X	X
Technical inspections		X												
Campaigns		X						X	X		X		X	
Education		X							X		X		X	
Legislation on alcohol		X				X		X	X		X	X	X	X
Legislation on fatigue/distraction		X				X		X	X		X	X	X	X
Legisaltion on restraining devices		X				X		X	X		X	X	X	X
Enforcement		X				X			X		X		X	
EMS notification		X				X					X	X	X	X
Insurance		X				X								
Trauma care		X				X					X	X		

Performance Indicators

Data	Data collection				Data sources						Availability		Reliability	
Area considered	**by authorities**	**Quest, surveys on representatives**	**Questionnaire surveys on users**	**Roadside observational survey**	**UN**	**WHO**	**IRF**	**OECD**	**EC**	**Other**	**OECD countries**	**M&LI countries**	**OECD countries**	**M&LI countries**
Performance Indicators														
Pavement				X										
High risk sites		X												
Road design		X												
Road network				X			X				X	X	X	
Crashworthiness of vehicle fleet		X							X		X		X	
Technical inspections		X												
Vehicle fleet characteristics	X								X		X		X	
Alcohol impaired driving		X						X	X		X		X	
Helmets				X		X		X	X		X	X	X	
Pedestrians				X										
Phoning				X										
Speeding				X				X	X		X			
Use of protective systems in cars				X		X		X	X		X	X	X	
EMS efficiency			X						X		X			

Fatalities & Injuries

Data	Data collection				Data sources						Availability		Reliability	
Indicators	**by authorities**	**Quest, surveys on representatives**	**Questionnaire surveys on users**	**Roadside observational survey**	**UN**	**WHO**	**IRF**	**OECD**	**EC**	**Other**	**OECD countries**	**M&LI countries**	**OECD countries**	**M&LI countries**
Fatalities & Injuries														
Fatality rates	X				X	X	X	X	X		X	X	X	X
by area & road type	X				X			X	X		X	X	X	
by type of accident	X								X		X		X	
by road users' age	X				X			X	X		X	X	X	
by road user type	X				X	X		X	X		X	X	X	X
Number of injured persons (MAIS3-	X													
Severity of accidents	X				X	X	X	X	X		X	X	X	X
% of casualties under-reporting									X		X			
Death rate of hospitalized injuries	X													
Length of hospiatlization in IC units	X													

Conclusions (1/2)

- International databases are **useful sources** of road safety related data.
- The **disaggregation level** of the data, as well as the variables used vary amongst the databases.
  - CARE database has a high level of disaggregation compared to the other databases.
- **Data availability** differs among types of data and countries worldwide.
  - High lack of exposure data and performance indicators in both OECD countries and M&LI countries
  - Data on measures not available at a large scale for M&LI countries.
  - Number of Serious Injuries under a common definition is not available in any database.
- Data are considered **more reliable** for OECD countries.

Conclusions (2/2)

- Certain **exposure, road safety performance indicators and estimated under-reporting percentages** are not considered reliable enough even for OECD countries.
- **Differences** are identified in certain cases on data published
  - e.g. IRF publishes the reported by national authorities number of fatalities, WHO estimates fatalities through a methodology, IRTAD and CARE databases use common definition and correction factors.
- Particular caution is recommended when **using international databases in a complementary way**.

Future challenges

- A **global road safety database** with detailed and comparable data would be useful for international road safety analyses. International Organisations and Stakeholders should intensify cooperation in this direction.

- More data on exposure and SPIs exist at national level, than those reported in international statistics and their **collection, harmonization and use** would be a major challenge.

- Use of **common definitions by indicator, under-reporting** of road casualties etc. are issues that should be addressed in the future in order to better evaluate the road safety problem worldwide.

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