International Conference on: “The Reliability of Statistics & Databases in Measuring Road Safety Performance Index (PIN)”
Tunis, 6-7 May 2016

Monitoring Road Safety Policies and Performance

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A high need for monitoring road safety policies and performance

- Road Safety is a typical field with high risk of important investments not bringing results

- Absence of monitoring and accountability limits seriously road safety performance
Tools for road safety accountability

- Monitoring ROAD SAFETY INTERVENTIONS
- Monitoring ROAD SAFETY PERFORMANCE INDICATORS (RSPI)
- Monitoring ROAD ACCIDENT AND CASUALTIES
Monitoring road safety interventions

Road User Behaviour
- number of road safety campaigns
- number of road safety training activities
- number of enforcement controls (speed, alcohol, seat belt, helmet etc)
- number of police staff taking part in enforcement activities per day / region

Vehicle and Post Crash Care
- incentives for vehicles with advanced safety equipment
- new equipment for emergency services
- training of emergency services staff
- new equipment for the Traffic Police and Fire Brigade services
Monitoring road safety interventions

Road Infrastructure

- number of identified high risk sites and related interventions
- length of road sections improved (lighting, visibility, markings, signing, road surface, etc.)
- number (and length) of Road Safety Audits conducted
- number (and length) of roads assessed (EuroRap)

Support actions

- Number of studies / analyses on road accident causes
Monitoring road safety performance indicators

Road User Behaviour

- speeding, comparison to mean speed, speed variance, speed limit violations
- percentage of seat belts’, child restraints’ and helmets’ use
- incidence of drinking and driving
- incidence of mobile phone use
- failure to stop or yield at junctions or at pedestrian crossings
- inadequate headways – close following
- use of reflective devices for cyclists and pedestrians
- use of pedestrian crossing facilities by pedestrians
Monitoring road safety performance indicators

Road Infrastructure

• percentage of road network with unclear hierarchy functions (flow, distribution, access)

• percentage of high speed roads with incompatible vehicles in terms of mass

• length of road sections violating driver’s expectations and increasing workload (lack of consistency – continuity)

• pavement friction mostly in winter and on wet road surfaces
Monitoring road safety performance indicators

**Vehicle**
- percentage of *new cars* with the top star rating according to EuroNCAP
- percentage of vehicles with *worn tires*
- percentage of technically *defective vehicles*

**Quality of post-crash care**
- average time for intervention at the accident scene
- average casualty transfer time to the hospital
- average casualty hospitalization duration
Monitoring road accidents and casualties

- number of **road accidents** with injuries or material damage only (per road type, vehicle type and road user type)

- number of **fatalities**, serious and slight **injuries** (drivers, passengers, pedestrians, etc.)

- **risk indicators**
  (number of accidents/injuries per vehicle-kms or passenger-kms, fatalities per million inhabitants, etc.)

- **severity indicators**
  (fatalities per 100 accidents, etc.)
Tools for road safety accountability

- Monitoring ROAD SAFETY INTERVENTIONS
- Analyses correlating Interventions with RSPI
- Analyses correlating Interventions with Accidents (Crash Modification Factors)
- Monitoring ROAD SAFETY PERFORMANCE INDICATORS (RSPI)
- Analyses correlating RSPI with Accidents
- Analyses correlating Cost-benefit/effectiveness
- Monitoring ROAD ACCIDENT AND CASUALTIES

Stergios Mavromatis – Monitoring Road Safety Policies and Performance
Road Safety analyses

• Road safety analyses: important tool in the hands of decision makers but also a complex task

• Road safety analyses require:
  - high expertise to deal with the analyses complexity,
  - impartiality and expert independence,
  - maximum transparency

• Accident Prediction Models (APMs) and Crash Modification Factors & Functions (CMFs) are fundamental for estimating road safety outcomes and identifying the most effective safety measures
The need for good and transferable Analysis Results

- An APM aims to **forecast safety outcomes** on the basis of traffic and other site-specific conditions (including CMFs).
- A CMF is a synthesis of diverse evaluation results that allows for more **universal understanding** and application of safety measures.
- Ex-post evaluations $\rightarrow$ meta-analyses $\rightarrow$ **theorizing**
- The more correct the functional form of the APM, and the narrower the CMF distribution, the larger is the probability that policy decisions are correct.
- APMs/CMFs could allow more rapid adoption and dissemination of **new safety measures**
- They can be the basis for evidence-based safety policies.
Technical barriers for road safety interventions assessment

• difficulties in **isolating the safety effect** of a specific measure

• difficulties in **aggregating** information/data due to high diversification of the measures

• difficulties in comparing information/data among countries:
  - differences in road traffic environments,
  - differences in the actual investment costs among the countries,
  - differences in methodologies of safety effect calculation
Political barriers for road safety interventions assessment

• Authorities and other stakeholders may fear that ex-post evaluation of measures may prove that important road safety investments had little or limited impact.

• Comparisons of measures effectiveness between different regions and between different countries may reveal high discrepancies not only in the unit cost of the measures but also in the implementation effort.
Transferability is not easy:
- not all successful measures are suitable for all different road traffic environments,
- it is very much possible that the same interventions may lead to significantly different results in two different traffic environments

The scientists' competition and quest for the "excellent" methodology, together with the inherent difficulties of measures efficiency assessment, puts in question any initiative.

Sometimes measures assessment invited by the authorities tend to use faster and less rigorous methodologies, favouring prevailing opinions and decisions already taken, creating thus a wide variety of non-converging efficiency results.
Correlating road safety management and performance

• **Economically stronger countries** have a higher composite road safety performance index.

• Countries with **regular measurement** of road safety attitudes and behaviours have a higher operational level of road safety.

• Countries with **dedicated road safety budget**, systematic monitoring and evaluation of interventions, have a higher operational level of road safety.

• The presence of a **national vision and strategy** is not sufficient alone for a better operational level of road safety.
Correlating road safety management and performance

• Road safety management indicators do not directly affect road safety results.

• However, they do affect the operational level of road safety, as reflected by the safety performance indicators.

• Subsequently, higher safety performance indicators have a direct impact on the decrease of accidents and casualties (confirming the SUNflower pyramid)
Tools for road safety accountability

Monitoring ROAD SAFETY INTERVENTIONS

Analyses correlating Interventions with RSPI

Monitoring ROAD SAFETY PERFORMANCE INDICATORS (RSPI)

Analyses correlating Interventions with Accidents (Crash Modification Factors)

Analyses correlating Cost-benefit/effectiveness

Making widely available all Monitoring and Analysis Results

Analyses correlating RSPI with Accidents

Monitoring ROAD ACCIDENT AND CASUALTIES
Next steps for efficient monitoring of road safety policies and performance

- More **surveys** for exposure, performance indicators, driver behaviour
- More large scale **experiments** (in-depth investigation, naturalistic driving, driving simulator)
- More **research and analyses**
- More **solutions** to (new) real life problems
- More data and knowledge **widely available**
- More rigid European and National Road Safety **Observatories**
In conclusion: Monitor - Analyse - Publish

- Beneath each high road safety performance lies a powerful system for the monitoring and analysis of interventions, indicators and safety results.

- Road safety Monitoring and Analysis should become a mandatory procedure for all road safety investments. Any following investments should be linked with the performance of the previous investments.

- The level of economic and social development of a society is based on and reflected in the level of road safety, as assessed by the Performance Indicators.
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