The role of learning processes in road safety trends

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• Discussion
Individual learning

Elvik, R., 2015. Some implications of an event-based definition of exposure to the risk of road accident, AAP 76 15-24
Smeed’s law

• Smeed’s formula (1949): \( D = 0.0003 \left( \frac{N \cdot P^2}{N} \right)^{1/3} \)
  • \( D \) – road fatalities
  • \( N \) – number of registered vehicles
  • \( P \) – population

• Two ways of interpretation:
  • \( \frac{D}{N} = 0.0003 \left( \frac{N}{P} \right)^{-2/3} \)
  • \( \frac{D}{P} = 0.0003 \left( \frac{N}{P} \right)^{1/3} \)
Societal learning

Mortality rate

Break point

Increase

Decrease

Very low and low  Medium  High  Very high

Motorization
Road safety evolution phases

- \( D/P = a \cdot N/P \cdot e^{-b \cdot N/P} \)
- \( a \cdot N/P \): increasing exposure due to the growing number of vehicles
- \( e^{-b \cdot N/P} \): decreasing risk due to the development in EEE
Fatality rates vs. motorization (EU 15, EU 13)
Delays of countries in reaching EU15 average
Advantage of latecomers

• Latecomers can improve their safety performances quicker than other countries due to:
  • the free movement of new technologies;
  • the international exchange of safety experiences;
  • the social attitude towards safety is increasing and also converging in the European countries.
EU safety trends
Learning across nations

• Research funding received by a country in the frame of road safety related international projects.
• Intensity of collaborations in road safety between countries.
• Transfer of knowledge on new technological, design etc. solutions.
• A country’s ability to receive and adopt safety related knowledge.

• ...

Human Development Index as a proxy

• HDI components:
  • life expectancy index – human life is valued
  • education index – intellectual values
  • Gross National Income (GNI) – income level
Summary

• 3 layers of learning
• Learning across nations is proposed
• Hard to be proven statistically

• Further steps: testing other variables
Thank you for your attention!