# Evidence Gap & Map
# Human factors

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**Globalising Vision Zero: Generating Scientific Evidence for the Road Ahead**
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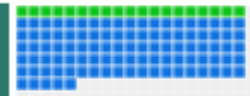
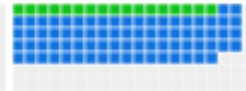
| | | Outcomes | | | | | |
|---|---|---|---|---|---|---|---|
| | | Primary Outcome (crashes) | | Intermediate Outcome | | | |
| | | Fatal crashes | Non-fatal injury crashes | Change in use of helmets | Change in use of Seat-belts | Change in speed | Change in alcohol/drug use |
| Human factors | Enforcement |  19/100 |  17/76 |  1/3 |  4/23 |  5/43 |  5/32 |
| | Sanctions and penalties |  7/24 |  7/18 |  1/0 |  2/4 |  1/4 |  3/`15 |
| | Driver training and licensing |  21/65 |  20/49 | | |  1/2 |  1/8 |
| | Road user education, awareness building & public campaigns |  10/28 |  10/28 |  4/2 |  4/17 |  1/4 |  10/28 |

# Human Factors: LIC+MICC and UMIC+HIC

| LIC+LMIC and UMIC+HIC | Fatal Crashes | Non Fatal Crashes | Change in use of Helmets | Change in use of Seatbelts | Change in Speed | Change in Alcohol/ Drug Use |
|---|---|---|---|---|---|---|
| Enforcement | 100 / 1 | 76 / 1 | 3 / 0 | 23 / 0 | 43 / 0 | 32 / 0 |
| Sanctions and Penalties | 24 / 0 | 18 / 0 | 0 / 0 | 4 / 0 | 4 / 0 | 15 / 0 |
| Driver Training and licencing | 65 / 0 | 49 / 0 | 0 / 0 | 0 / 0 | 2 / 0 | 8 / 0 |
| Road user education, awareness building & public campaign | 26 / 2 | 26 / 2 | 1 / 1 | 17 / 0 | 2 / 2 | 13 / 0 |
| Pedestrian | 0 / 0 | 0 / 0 | 0 / 0 | 0 / 0 | 0 / 0 | 0 / 0 |

**Upper Middle Income Countries + High Income Countries**

**LIC- Low Income Countries + Lower Middle Income Countries**

# Human Factors: SA+SAA+LAC+MENA and EAP+ECA+NA

| SA+SAA+LAC+MENA and EAP+ECA+NA | Fatal Crashes | Non Fatal Crashes | Change in use of Helmets | Change in use of Seatbelts | Change in Speed | Change in Alcohol/ Drug Use |
|---|---|---|---|---|---|---|
| Enforcement | 6 / 94 | 4 / 72 | 0 / 3 | 1 / 22 | 1 / 42 | 1 / 31 |
| Sanctions and Penalties | 1 / 23 | 1 / 17 | 0 / 0 | 0 / 4 | 0 / 4 | 0 / 15 |
| Driver Training and licencing | **1** / **64** | 1 / 48 | 0 / 0 | 0 / 0 | 0 / 2 | 0 / 8 |
| Road user education, awareness building & public campaign | **2** / **26** | 2 / 26 | 0 / 2 | 0 / 17 | 2 / 2 | 0 / 13 |
| Pedestrian | 0 / 0 | 0 / 0 | 0 / 0 | 0 / 0 | 0 / 0 | 0 / 0 |

**SA- South Asia, SAA- Sub Saharan Africa, LAC- Latin America and Caribbean, MENA- Middle East and North Africa**

**Europe, East Asia & North America**

# Human Factors: Non-motorized transport and Motorized transport

| NMT and MT | Fatal Crashes | Non Fatal Crashes | Change in use of Helmets | Change in use of Seatbelts | Change in Speed | Change in Alcohol/ Drug Use |
|---|---|---|---|---|---|---|
| Enforcement | 21 / 98 | 17 / 22 | 1 / 2 | 0 / 23 | 6 / 41 | 9 / 32 |
| Sanctions and Penalties | 3 / 23 | 1 / 18 | 0 / 0 | 0 / 4 | 0 / 4 | 1 / 14 |
| Driver Training and licencing | 3 / 64 | 1 / 48 | 0 / 0 | 0 / 0 | 0 / 2 | 0 / 8 |
| Road user education, awareness building & public campaign | 8 / 24 | 9 / 23 | 2 / 1 | 0 / 17 | 0 / 4 | 1 / 13 |
| Pedestrian | 0 / 0 | 0 / 0 | 0 / 0 | 0 / 0 | 0 / 0 | 0 / 0 |

**Non-motorized transport**

**Motorized transport**

# Driver education

| | | |
|---|---|---|
| • Pre license training - intensive driving course | Increase in crashes | de Craen & Vlakveld, 2013 |
| • School-based driver education | No evidence that driver education reduces road crash involvement | Fell, 2017 |
| • Post-licence driver education | No evidence that post-licence driver education is effective | Ker K, Roberts IG et al 2003 |
| • Motorcycle rider training | Results not clear. Rider training practice can therefore not be recommended. | Kardamanidis K et al, 2010 |


- de Craen, S., & Vlakveld, W. P. (2013). Young drivers who obtained their licence after an intensive driving course report more incidents than drivers with a traditional driver education. Accident; Analysis and Prevention, 58, 64–69. https://doi.org/10.1016/j.aap.2013.03.037
- Kardamanidis K, Martiniuk A, Ivers RQ, Stevenson MR, Thistlethwaite K. Motorcycle rider training for the prevention of road traffic crashes. Cochrane Database of Systematic Reviews 2010, Issue 10. Art. No.: CD005240. DOI: 10.1002/14651858.CD005240.pub2.
- Ker K, Roberts IG, Collier T, Beyer FR, Bunn F, Frost C. Post-licence driver education for the prevention of road traffic crashes. Cochrane Database of Systematic Reviews 2003, Issue 3. Art. No.: CD003734. DOI: 10.1002/14651858.CD003734.
- Roberts IG, Kwan I. School-based driver education for the prevention of traffic crashes. Cochrane Database of Systematic Reviews 2001, Issue 3. Art. No.: CD003201. DOI: 10.1002/14651858.CD003201.

# License suspension

| | | |
|---|---|---|
| • All offenders | 17% decrease in crash rate | Masten, 2004 |
| • Higher length of licence suspension of Drink drivers | 4.1% decrease | Fell, 2017 |
| • Although licence suspension is an effective measure there is no proof that its effects outlast the period of suspension itself | | Goldenbeld, Ch 2017 |


- Fell, J.C. & Scherer, M. (2017). Administrative license suspension: Does length of suspension matter? Traffic Injury Prevention, DOI: 10.1080/15389588.2017.1293257
- Goldenbeld, Ch (2017), Licence suspension, European Road Safety Decision Support System, developed by the H2020 project SafetyCube.
- Masten, S.V. & Peck, R.C. (2004). Problem driver remediation; A meta-analysis of the driver improvement literature. Journal of Safety Research, 35, 403-425.

# Safety campaigns & education

| | | |
|---|---|---|
| • Overall effect of road safety campaigns | Decrease of 8% for injury crashes and 11% for fatal. Latter not significant. | Phillips, R., Ulleberg, P. & Vaa, T. 2011 |
| • Anti speeding & drink-driving behaviour | No significant change. | Phillips, R., Ulleberg, P. & Vaa, T. 2011 |
| • Safety education of pedestrians | Effect on injury occurrence is unknown | Duperrex O, Roberts I, 2002 |

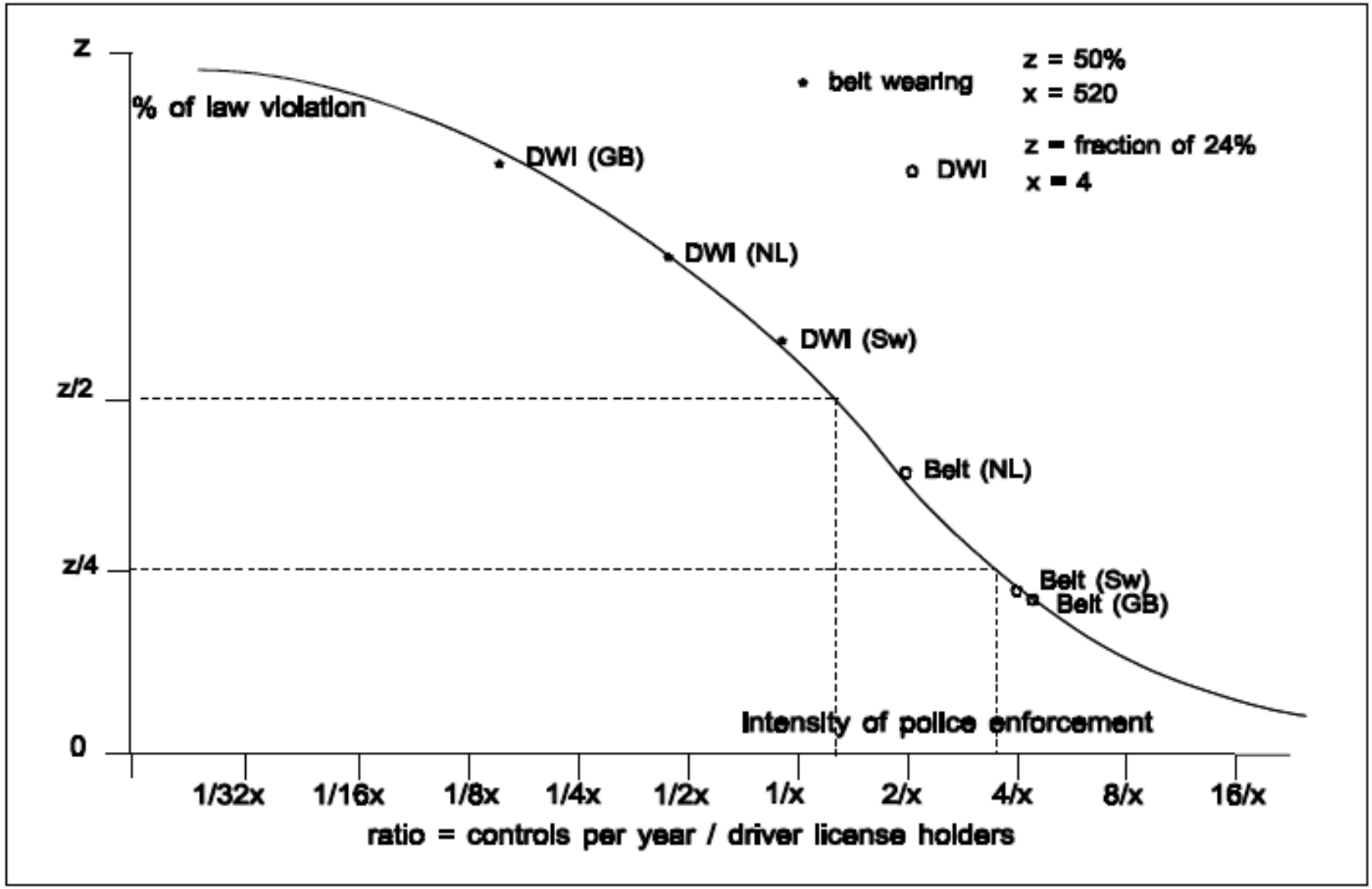

- Duperrex O, Roberts I, Bunn F. Safety education of pedestrians for injury prevention. Cochrane Database of Systematic Reviews 2002, Issue 2. Art. No.: CD001531. DOI: 10.1002/14651858.CD001531.
- Phillips, R., Ulleberg, P. & Vaa, T. (2011): Meta-analysis of the effect of road safety campaigns on accidents. Accident Analysis and Prevention, 43, 1204–1218.

# Enforcement

| | | |
|---|---|---|
| • Effectiveness of DUI checkpoints | Overall reduction of total crashes - 14% | Erke, A., Goldenbeld, C. & Vaa, T. 2009 |
| • Seatbelt law and enforcement | Seatbelt use increase 21% & decrease in deaths | Høye A., (2009) |
| • Mobile phone use | No clear conclusions can be drawn | Theofilatos, A., 2017 |
| • Increase in fines | Violations<br>< 50% : no change<br>50-100% : 15%<br>>100% : 4%<br>Effect on deaths not known | Elvik, 2016 |


- Elvik, R. (2016). Association between increase in fixed penalties and road safety outcomes: A metaanalysis. Accident Analysis and Prevention, 92, 202–210.
- Erke, A., Goldenbeld, C. & Vaa, T. (2009). The effects of drink-driving checkpoints on crashes-A metaanalysis. Accident Analysis and Prevention, 41(5) , 914–923.
- Høye A., (2009) "Control of the use of personal protective equipment" The Handbook of Road Safety Measures, Norwegian (online) version. http://tsh.toi.no/index.html?22743
- Theofilatos, A., (2017), Law and Enforcement - Distraction: Laws and enforcement against mobile phone use while driving, European Road Safety Decision Support System, developed by the H2020 project SafetyCube.

# Relationship between enforcement intensity and law violation levels




Matthijs Koornstra (SWOV), David Lynam (TRL), Göran Nilsson (VTI), Piet Noordzij (SWOV), Hans-Erik Petterson (VTI), Fred Wegman (SWOV) and Peter Wouters (SWOV) (2002) *SUNflower: a comparative study of the development of road safety in Sweden, the United Kingdom, and the Netherlands, SWOV, Leidschendam*

# Alcohol related BAC limits, road toll and enforcement measures in selected European countries

| Country | Legal blood alcohol limit g/L | Police tests per 1,000 inhabitants | Share of alcohol related road fatalities, percent | | Share alcohol offenders (above legal limit) | Share respondents who had atleast once a week 5 or more drinks |
|---|---|---|---|---|---|---|
| | | Number | Expert estimates | Official statistics | % | % |
| Poland | 0.2 | 47 | 13 | 7 | 9.5 | 19 |
| Portugal | 0.5 | 63 | 35 | 6 | 5.9 | 28 |
| Austria | 0.5 | 87 | 18 | 6 | 5.8 | 36 |
| Spain | 0.5 | 112 | NA | 31 | 1.8 | 34 |
| Hungary | 0 | 130 | 8 | 31 | 3.1 | 24 |
| France | 0.5 | 190 | 29 | 31 | 3.3 | 20 |
| Sweden | 0.2 | 287 | 25 | 16 | 0.8 | 13 |
| Finland | 0.5 | 385 | 24 | 29 | 1.3 | 22 |

# Questions?

**How has Vietnam achieved this level of enforcement?**

# Questions?


**Effect of speed enforcement in all villages along rural highways In Tanzania**

**Thousands of speed cameras in Iran, China……?????**

# Questions?


**Effect of millions of “Illegal” speed humps on roads in ~ 500,000 villages in India**

# Research Needed

- Level and intensity of enforcement needed for different objectives
- Research methods for assessment in different locations
- Speed enforcement on rural highways
- Should penalties be set at some proportion of professional drivers wages?
- Enforcement methods for high density pedestrian and PTW modal shares
- What will it take for international aid agencies to promote evidence based interventions?