PEDESTRIANS ROAD-CROSSING BEHAVIOUR AND THE INFLUENCE OF CULTURE ON SOCIAL INFORMATION USAGE

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International Road Federation
Fédération Routière Internationale
Federación Internacional de Carreteras
www.irfnet.ch

The International Road Federation

Independent, Not-for-profit Organisation established in **1948.**
Based in **Geneva**, Switzerland and operating globally

Membership: **public** sector, **private** sector, **academia**, **NGOs**

72 Years of Action
3 Strategic Pillars of Activities

1. Knowledge & Expertise 2. Connections 3. Advocacy

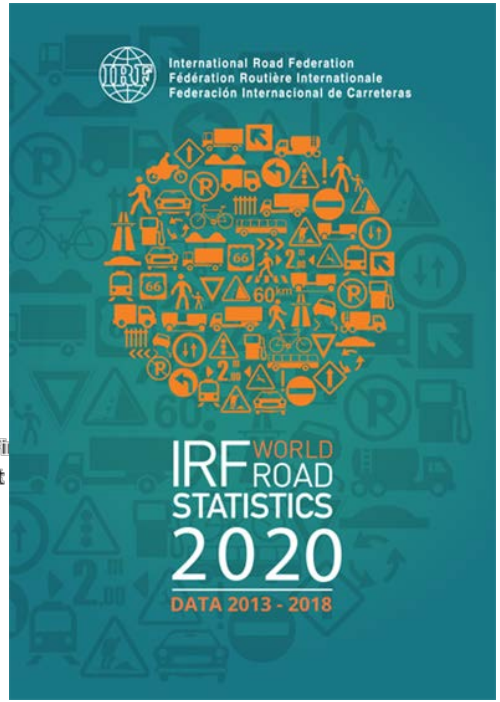
The IRF World Road Statistics

Road Networks

Country Profiles

Production, Import, Fi
Registration & Export
Motor Vehicles

Road Traffic
Volumes



Road Accidents

Multimodal Traffic
Comparisons

Vehicles in Use

Road Expenditures
& Revenues

- Edited yearly since 1964 (**57 years**).
- Covering **208 countries**, **56 indicators**, 11 sections.
- Data collected from **primary statistical sources** (Ministries, Road Authorities, National Statistical Offices)
- **Definitions** based on the **Glossary of Transport Statistics**
- **Data used by** Governments, Investment & Development Banks, Public & Private Companies, Academia, NGOs, International Organizations, etc.

www.worldroadstatistics.org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NEW!
IRF GLOBAL ROAD DATAWAREHOUSE
with the support of
TOTAL FOUNDATION

IRF 2020 Global Comparison Dashboard (All data is reported directly from official sources)

Map 1 - Select Region | Map 1 - Select Income Group | Map 2 - Select Region | Map 2 - Select Income Group

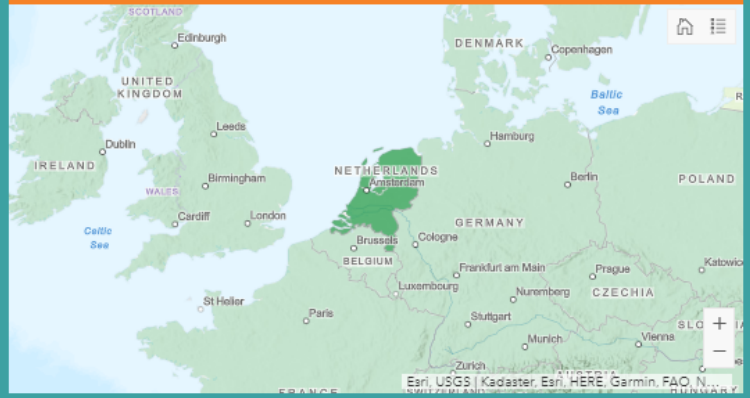
Income Group

- High Income
- Upper Middle Income
- Lower Middle Income
- Low Income

Select Country - Map 1

- Morocco
- Mozambique
- Myanmar
- Namibia
- Nepal
- Netherlands
- New Caledonia
- New Zealand
- Nicaragua
- Niger
- Nigeria
- North Macedonia

Netherlands



Country Metrics

Fatalities per 100,000 Population	Vehicles per 1,000 Population	Road Network Density (km/km²)	Paved Roads
3.6 (2017)	549.1 (2017)	5.50 (2017)	75% (2017)

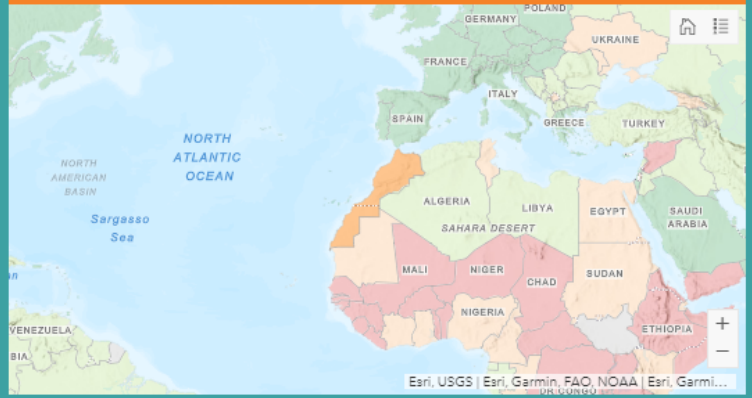
Region Metrics

Fatalities per 100,000 Population	Vehicles per 1,000 Population
6.0 (2017)	536.2 (2017)

Income Group Metrics

Fatalities per 100,000 Population	Vehicles per 1,000 Population
9.1 (2017)	618.1 (2017)

Morocco



Country Metrics

Fatalities per 100,000 Population	Vehicles per 1,000 Population	Road Network Density (km/km²)	Paved Roads
10.4 (2017)	109.9 (2017)	0.13 (2017)	76% (2017)

Region Metrics

Fatalities per 100,000 Population	Vehicles per 1,000 Population
7.1 (2017)	111.6 (2017)

Income Group Metrics

Fatalities per 100,000 Population	Vehicles per 1,000 Population
12.6 (2017)	160.3 (2017)

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Select Country Map 2

- Mauritius
- Mexico
- Micronesia, Fed. Sts.
- Moldova
- Monaco
- Mongolia
- Montenegro
- Morocco
- Mozambique
- Myanmar
- Namibia
- Nepal

World Road Statistics - Europe Road Safety Dashboard

(All data is reported directly from official sources)

Austria

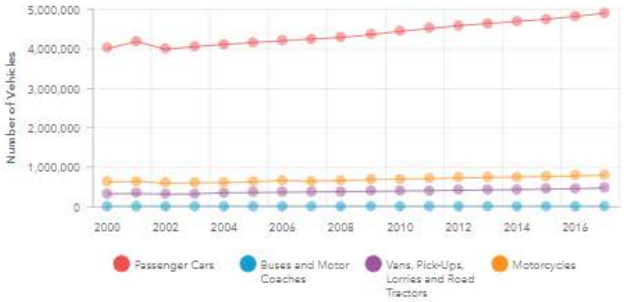
Road Accident Injuries

Austria

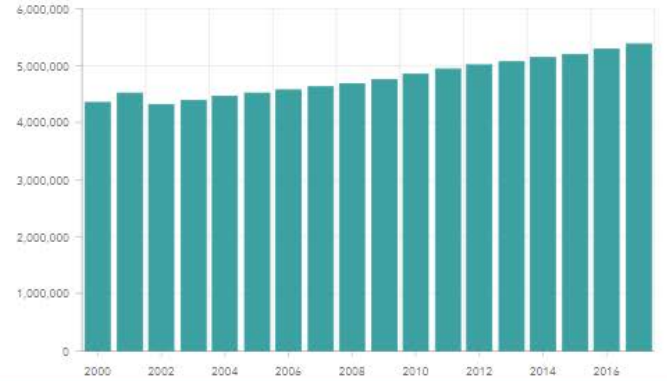
Population
8,797,566
High Income

Road Network Density
1.66 km/km²
(2017)

Vehicles in Use



Total Vehicles



Road Accidents: Country/Region

Persons killed per 100,000 population	Injury accidents per 100,000 population
4.7 (2017)	425.1 (2017)
High Income Average	High Income Average
4.8 (2017)	192.9 (2017)
Europe Regional Average	Europe Regional Average
6.0 (2017)	191.9 (2017)

Road Network Length

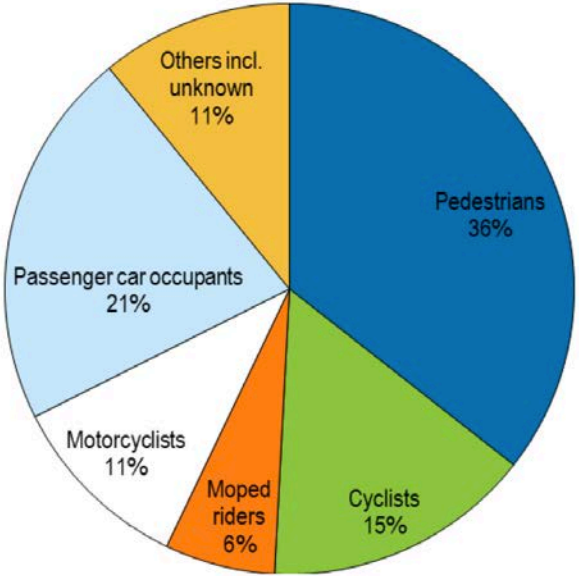
The size of the problem

- 54% of the 1.3 million road traffic deaths are “vulnerable road users”
- Wide variation in location (city versus rural) from one country to the other.
- One common point: most pedestrian collisions occur when pedestrians are crossing the road.

Every minute somebody dies in urban traffic.

Pedestrians Safety in Japan

Road fatalities by road user group in percentage of total, 2018

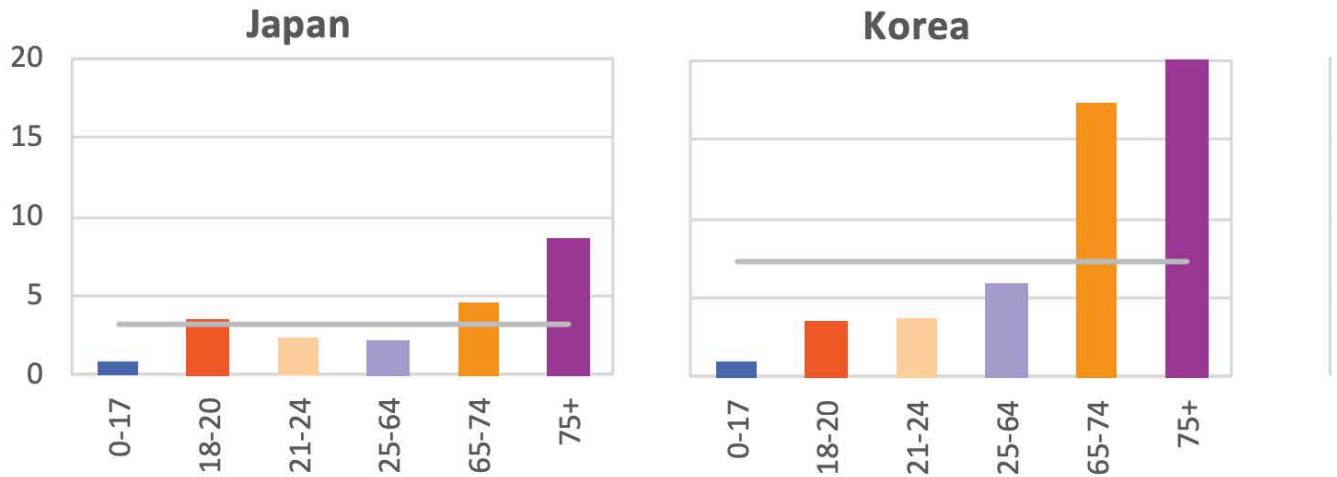


Source: IRTAD Road Safety Annual Report 2020

- In 2018, 1’482 pedestrians were killed on Japanese roads.
- About 70% of all pedestrian fatal accidents in Japan occur while crossing the road.
- A third of these crossing death accidents occur while using a pedestrian crossing.

Roads are getting more risky for seniors

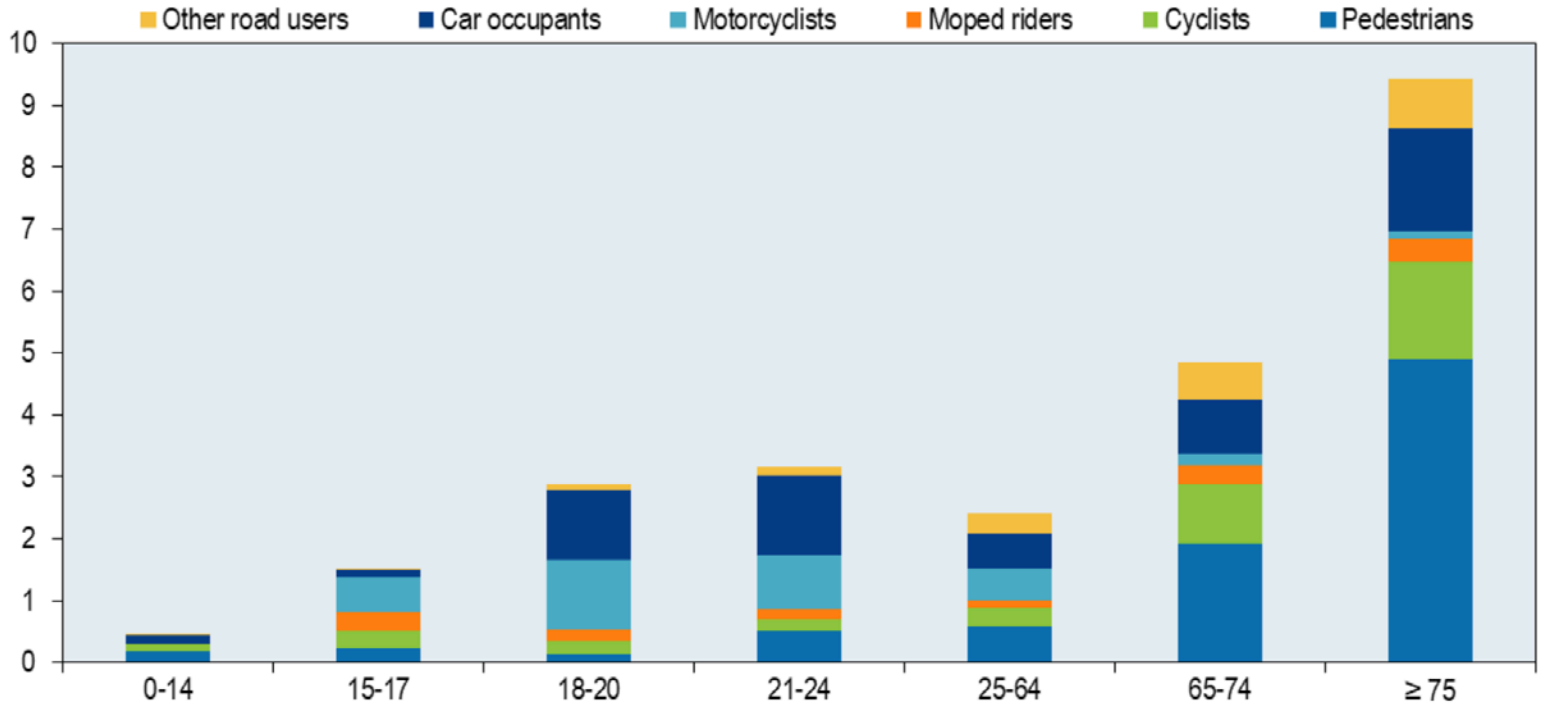
Mortality rate by age group
Road deaths per 100 000 inhabitants in a given age group, 2018



Source: IRTAD Road Safety Annual Report 2020

Safety in Japan

Road fatality rate by age and road user group, 2017
Fatalities per 100 000 population



Source: IRTAD Road Safety Annual Report 2020

SPEED

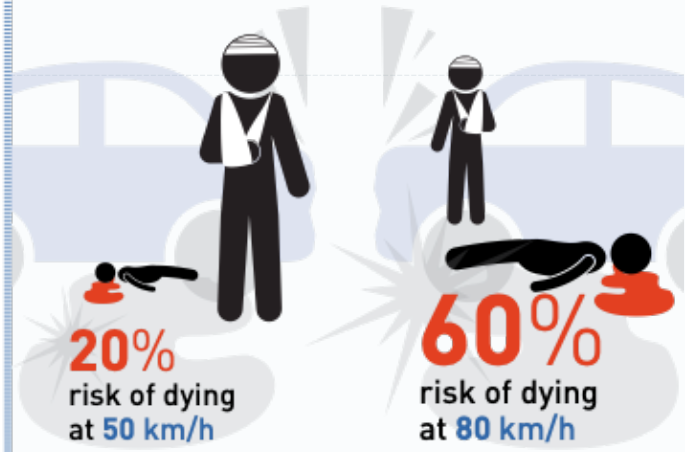
is at the core of the road traffic injury problem.

Excessive speed is when a vehicle exceeds the posted speed limit

40–50% of people drive above the speed limit

1 in **3** deaths on the road in high-income countries is due to speed

The higher the speed of the vehicle, the higher the risk of injury and death for pedestrians



Risk factors

- Speed
- Distraction
- Alcohol
- ….

Pedestrian behaviour has become an important research area as the size of human population living in big cities increases.

Pedestrians road-crossing behaviours

A better understanding of **how human beings behave** and the identification of **mechanisms underlying behavioural differences** between individuals of different genders, ages and cultures, provide a better basis for prevention and education.

Cultural influence of social information use in pedestrian road-crossing behaviours.

A study assessing how pedestrians use social information to cross the road in cities of two countries with different social norms: **France and Japan**.

The use of **social information** and the probability of **rule breaking** are strongly correlated with the **culture a**nd the country of pedestrians, with each country having its own principles of conformism and social norms.

Marie Pelé, Caroline Bellut, Elise Debergue, Charlotte Gauvin, Anne Jeanneret, et al.. Cultural influence of social information use in pedestrian road-crossing behaviours. Royal Society Open Science, The Royal Society, 2017, 4, pp.160739. ff10.1098/rsos.160739ff. ffhal-01487812f https://royalsocietypublishing.org/doi/full/10.1098/rsos.160739

The role of social information in decision-making

The observation of road- crossing behaviours in the presence of other individuals is an ideal means to study the influence of social information on decision-making.

The study scored the collective crossing of pedestrians at four locations in Nagoya (Japan) and three locations in Strasbourg (France).

Collective road-crossing behaviours

This study attempts to identify the mechanisms underlying collective road-crossing behaviours and investigates how these mechanisms and the use of social information are affected by different factors such as the number of pedestrians, their time of arrival at the crossing point, their gender, age and culture.

Decision-making process

Three major constraints:
1. **the time** it has to decide,
2. **the information** concerning each alternative (on which the decision accuracy depends)
3. **the risk involved** in each alternative.

Information an individual obtains from its environment can be:
1. **Social**
2. **non-social** (i.e. gained from personal observations)

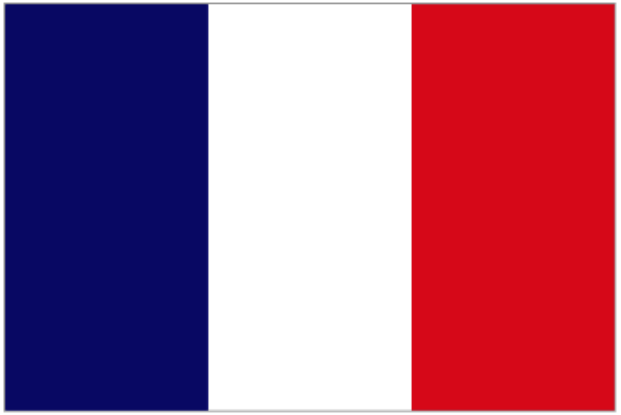
Social information can help to adpat to environment but can also play tricks!

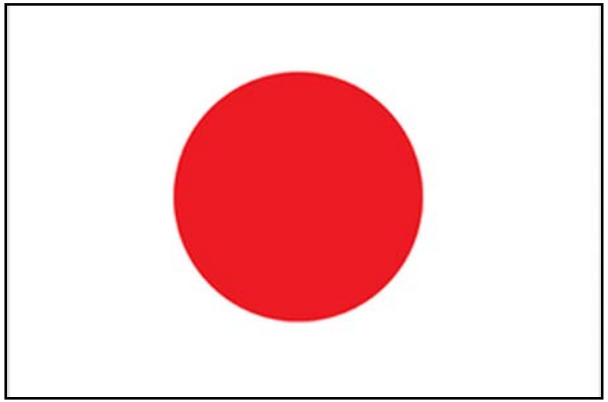
Social information use

Information cascades:
A pedestrian observes action of others and does the same.

Amplification process:
probability to cross with red light increases with the number of individual crossing.

Why France and Japan?





Western cultures – individualistic:

More risky behaviour, less tolerance for hierarchical relationships or for following rules, and more individualism than in Asian cultures. Individualistic culture tends to make people more autonomous.

Asian cultures – collectivist:

Societies seem to drive individuals to be more cautious: follow rules and take less risk.

The test in a nutshell

- 4 sites in Nagoya and 3 in Strasbourg
- Same traffic speed and number of pedestrians
- Rule breaking rate and time of crossing according to:
  1. **Environment** (color, lanes)
  2. **Gender/age/time of arrival** at the kerb
  3. **Social variables**: country, number of pedestrian waiting, accompanies or not and behaviour of others.

Individual crossing at red light

- Among 5445 road crossings analysed (3814 in France, 1631 in Japan) 30% of crossings were illegal.
- However, this rate of rule-breaking is different for France (41.9%) and Japan (only 2.1%).
- when Japanese and French data are combined, the rate of rule-breaking is affected by gender.

Collective crossing at red light

- French and Japanese pedestrians have different behaviours when following other pedestrians who are crossing against the red light.
- Japanese follow faster.
- Social influence is strong: “group pressure”.

Study's findings

1. Great **impact of country** of residence.

2. Japanese people tend to use more **social information** than French people who rely more on personal information.

3. Number of waiting pedestrians and **gender** are also important.

Conclusion

Tailoring the right strategies to reduce pedestrians' fatalities requires solid understanding of their decision-making processes, meaning how they perceive and interpret information they receive.

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