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Summary

@Risk

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@RISK: Analyse van het risico op ernstige en dodelijke verwondingen in het verkeer in functie van leeftijd en verplaatsingswijze.

@RISK : Analyse du risque de blessures graves ou mortelles dans la circulation, en fonction de l'âge et du mode de déplacement.

@RISK

Analysis of the risk of serious or fatal injuries in traffic according to age and mode of transport - Summary

Objective

This study calculates the risks of serious and fatal injuries in traffic for different transportation modes (pedestrians, cyclists, motor bike riders, drivers and passengers in cars and users of trams and buses) and for different age groups (6-14; 15-17; 18-24; 25-44; 45-64; 65-74; and over 75). The results provide answers to questions such as: is it safer to travel 10 kilometres by car than by bike? What is more dangerous: walking 10 minutes or driving a car for 10 minutes? Who runs a greater risk of being seriously injured in an accident involving a bicycle, an old person or a child? Which is the most dangerous form of travel? And which is the safest?

Underlying principles for calculating risks

A risk is always present when there is the possibility of something undesirable happening (in this case being seriously wounded or even being killed in a traffic accident). Risks are calculated per unit of exposure to this risk. The most important estimate of exposure is the distance travelled in traffic. So, for instance we compare the danger of being seriously injured on a 10-kilometre journey by bike with the same distance travelled by car. Knowledge about these risks is particularly useful when looking at changing forms of transport because it provides an insight into the effect on road safety if part of a journey is made using a different form of transport. This report therefore focuses on *the risk of moving from one place to another*, the *risk per kilometre travelled*. However, the study also looks into the risk of being present in traffic (the risk per minute).

The main focus of this report, in accordance with European developments, is the *risk of serious and fatal injuries*. Serious injuries are defined, according to the **Maximum Abbreviated Injury Scale** (AIS, Gennarelli, 2008), as injuries with a MAIS score of 3 or more. These include *injuries resulting in long-term (sometimes life-long) physical or mental limitations* for the victims. A new aspect compared to current practices is that we take all victims into who are hospital bound with serious injuries or who die on the spot, thus correcting the under-registration of injured victims by the police. In this study we also calculate the risk of fatal accidents separately.

In a nutshell, risks are calculated according to *travel behaviour* (the distances covered and the amount of time spent in traffic) as well as the transportation mode and the age of the *victims of traffic accidents*.

Travel behaviour

More than 80% of distances covered on public roads are by car either as a driver (more than 60%), or as a passenger (around 20%). Only 5% of journeys are carried out by tram or bus, and cyclists and pedestrians account for a mere 3% distances travelled. A tiny 1% of journeys are by motorcycle or moped.

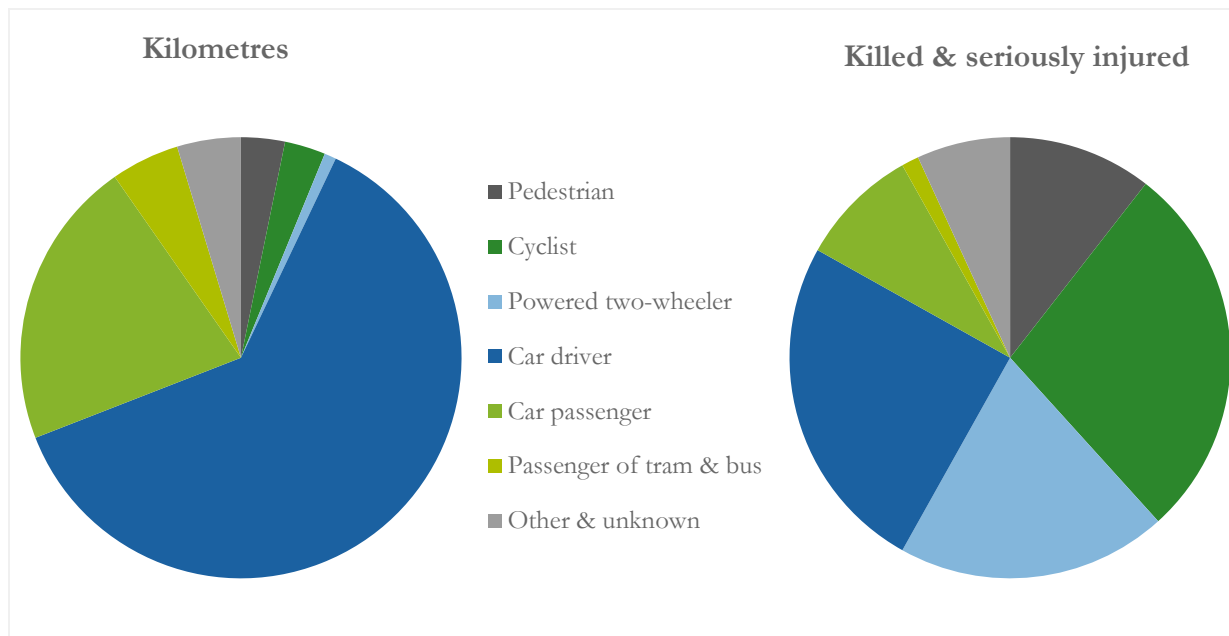
If we look at the time spent in traffic, we see a bigger difference for pedestrians because they travel much more slowly than all the other road users: their share of the time in traffic is 21%.

The largest share (70%) of distances covered is taken up by people aged between 25 and 65. Just 8% of journeys are carried out by people over 65 while for children and teenagers (6-24) this figure is 17%.

Traffic victims

The table below compares the transport modes for the distances travelled with their shares of serious injuries and deaths in traffic accidents.

The transport modes and their of the distances travelled (2009) and of killed or seriously injured (MAIS3+) road crash victims (2007-2011)



Source: BELDAM, *Federal Public Service for Economy - General Directorate for Statistics and Economic Information, Infographics Belgian Road Safety Institute.*

Almost one third of the total of the seriously injured or killed victims are among cyclists (28%). This is the biggest group and the share of this group of victims is much bigger than the share of the distances they travel. Cyclists are followed by car drivers (25%) and motorcyclists and moped riders (20%).

The study reveals that for young people between 6 and 24 and elderly people over 65 their share among the victims (26% and 17% respectively) is greater than the share of the number of kilometres they travel.

Relative risk compared to motorists

The table below illustrates the *relative* risks of serious (MAIS3+) or fatal injuries per kilometre travelled. The risk for each group (transport mode and age) is compared to the risk for an average car driver. Figures over 1 indicate that the risk for the group in question is greater than the risk for the average car driver while any numbers under 1 indicate a smaller risk.







Motorcyclists or moped riders run by far the greatest risk (57 times greater than motorists). The risk per kilometre travelled for them is more than twice as much as that for cyclists, which is the second highest category. Pedestrians also run a risk per kilometre that is eight times higher than that for a car driver.

Not all cells in this table contain a figure. The reason is that given the information available, certain risk values cannot be assessed with sufficient reliability. This is true in particular for motorcyclists or moped riders aged between 15 and 17. Each year more than 50 motorcyclists or moped riders in this age group are either seriously injured or killed. As such, *one third* of the victims between 15 and 17 are mopedists or

motorcyclists. The number of young people who state that they use this type of transport, however, is particularly small (less than 1%). This indicates an extremely high risk for this group¹.

Relative risk: how does the risk of serious injury or death for a group of road users compare with the risk for the average car driver?

road user type

Age	 Pedestrian	 Cyclist	 Power two wheeler	 Car driver	 Car passenger	 Passenger of bus & tram	All users
6-14	10,5	18,9			0,3	0,03	1,6
15-17	7,7	10,5			1,4	-	4,1
18-24	4,9	8,0	72,6	4,3	2,5	-	4,6
25-44	4,7	12,5	55,8	0,8	0,9	0,3	1,7
45-64	6,2	21,6	41,5	0,7	0,5	1,3	2,1
64-74	12,0	92,6		1,1	1,3	1,0	4,4
75+	27,5	122,9		3,4	3,1	7,1	10,9
All age groups	8,1	23,0	57,0	1,0	1,0	0,6	2,5

Relative risks based on the number of killed and seriously injured (MAIS3+) victims per distance travelled. The reference category is the average risk for car drivers. Source: BELDAM, Federal Public Service for Economy - General Directorate for Statistics and Economic Information; Infographics: Belgian Road Safety Institute.

The risk for passengers in vehicles, cars, trams and buses is much smaller than for vulnerable road users. The risk of travelling by tram and bus is in fact clearly lower than the risk for car passengers. We deduce therefore that trams and buses are the safest means of transport while motorbikes or mopeds are the most dangerous forms of transport.

A comparison of the different *age groups* reveals that both young people and older people run an increased risk. The peak risk among *young people* varies depending on the form of transport. The peak for each form of transport occurs when people start to travel in that mode: for cyclists and pedestrians this is between 6 and 14; for motorcyclists and moped riders from 15 to 17 and for car drivers from 18 to 24. Risks for young car drivers between 18 and 24 are *four times greater* than for the average car driver, but the risk for 15 to 17 year-old motorcyclists or moped riders is at least 30 times greater than for these young car drivers.

The risk for people aged 75 and older is four times that of the average road user. We see this increased risk not just among motorists but also among cyclists, pedestrians, motorcyclists and also tram and bus users. Older people run the highest risk as cyclists, pedestrians and tram and bus users. Risks for cyclists start to grow from an early age compared to other forms of transport and half of all serious road traffic victims over the age of 64 are cyclists.

¹ Older motorcyclists and moped riders (65 and older) probably run a considerably increased risk, but the number of victims and motorcyclists or moped riders that age is small, so it is not possible to make a reliable evaluation for these groups.

Risk per amount of time spent in traffic

Compared to other road users, cyclists and pedestrians need much more time to cover a certain distance. However, when calculating the risk per unit of time we get a somewhat different picture for these groups. For pedestrians for instance, the risk per minute spent in traffic is no higher than that for motorists. In other words, 10 minutes of walking is just as safe as driving a car for 10 minutes. But, if a person has to walk as far as a motorist can travel in 10 minutes the risk over this distance is much higher than for a motorist.

The risk for cyclists per kilometre is more than 20 times that for a motorist. The relative risk per minute is lower, but is still 8 times higher. The *fatal risk per minute* for cyclists is not that much higher than for motorists and is “only” four times greater. This illustrates that cyclists run a particularly great risk of serious injuries but not so much of life-threatening injuries.