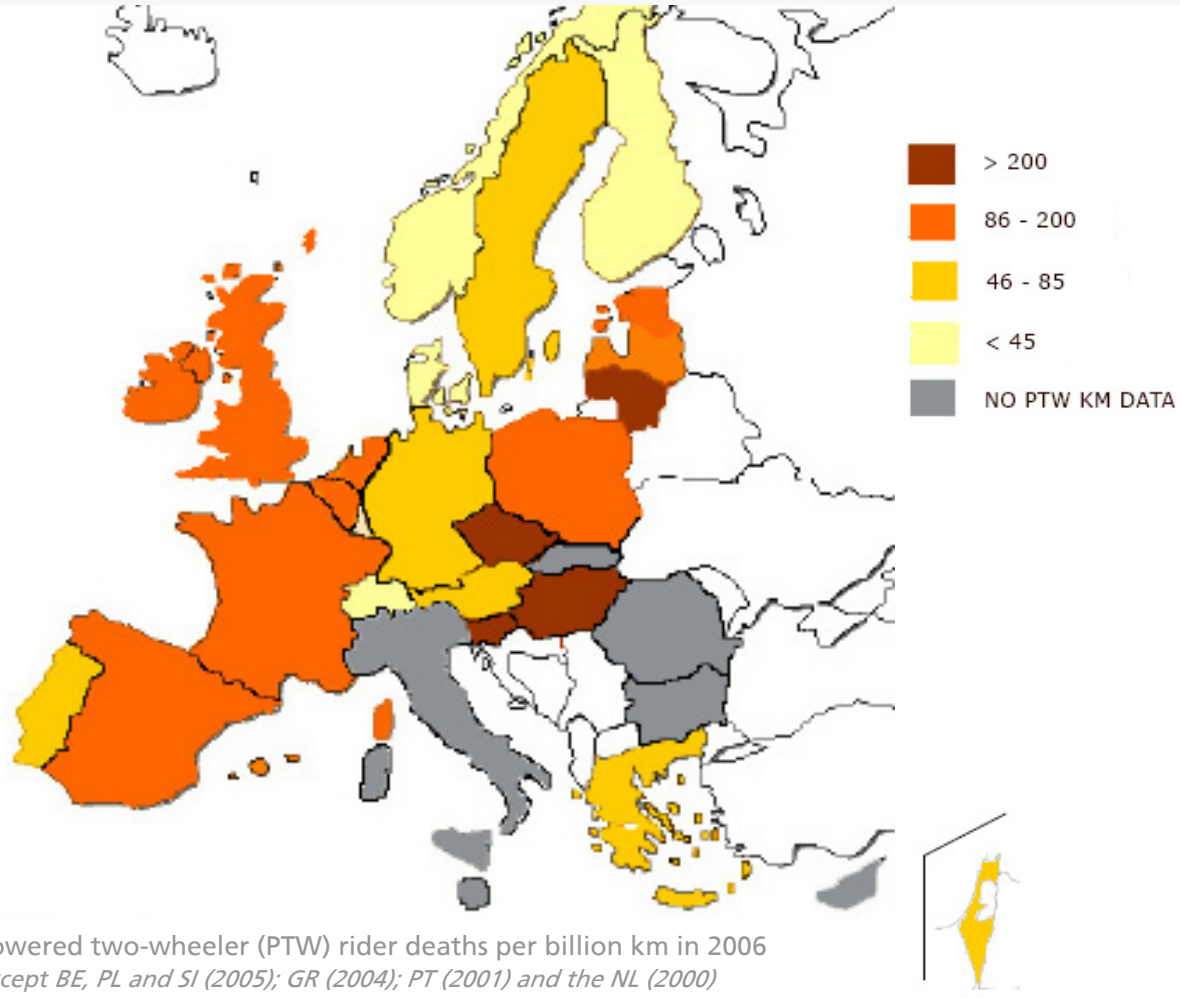
Reducing motorcyclist deaths in Europe

This sixth ranking under the Road Safety Perfomance Index (PIN) looks at the safety of motorcyclists in European countries and compares its develoment in time.

In 2006 at least **6200** Powered Two-Wheeler (PTW) riders were killed in road crashes in the EU 25 representing **16%** of the total number of road deaths while accounting for only **2%** of the total kilometres driven.

It is well known that motorcyclists face a much higher risk of being killed than other road users. For the same distance travelled, a motorcyclist has on average 18 times the risk of being killed in a road accident that a car driver has. This report shows that **Norway**, **Switzerland**, **Denmark** and **Finland** are the least dangerous places to ride, whereas Central and Eastern European countries are the most dangerous.



Powered two-wheeler (PTW) rider deaths per billion km in 2006
Except BE, PL and SI (2005); GR (2004); PT (2001) and the NL (2000)

This report also shows that, while the number of road deaths has declined considerably in the past decade in Europe, the number of killed PTW riders rose in 13 out of 27 countries. This rise can only partly be attributed to the increase in use of PTWs and should urgently receive special attention from policy makers at the national and European levels.

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A great disparity of risks

PTW riders in **Norway**, **Switzerland**, **Denmark** and **Finland** enjoy a lower level of risk than riders in the rest of Europe (Map, Fig. 1). In these countries with a relatively good overall level of road safety, average rider deaths are between 30 and 45 per billion km. A second group of countries, consisting of a road safety champion (**Sweden**) but also countries with a medium (**Germany**, **Portugal**, **Austria**) or even a poor overall level of safety (**Greece**), are just below the EU average of 86 rider deaths per billion km.

In **Spain**, **Ireland**, the **Netherlands**, **France**, **Great Britain**, **Belgium**, **Estonia** and **Poland**, rider deaths are above the average of 86 but below 200 per billion km; while in **Latvia**, **Hungary**, **Czech Republic** and **Slovenia**, riders were exposed to death rates above 200 per billion km.

Significant disparities in terms of riders' safety exist in Europe. While the difference in overall road safety performance between the worst and the best performing European country is a factor 3 (PIN Flash 6), the difference for PTW riders is a factor of 10. The Slovenian riders have 10 times the risk of being killed per km ridden that their Norwegian counterparts have.

This indicator of risk for PTW riders could not be calculated for **Bulgaria**, **Cyprus**, **Italy**, **Lithuania**, **Luxembourg**, **Malta**, **Romania** and **Slovakia** due to the lack of data on the number of km ridden by motorcyclists. The number of motorcyclists killed in **Italy** is available only until 2004, in **Greece** and **Slovenia** until 2005 and only since 2002 in **Lithuania**.

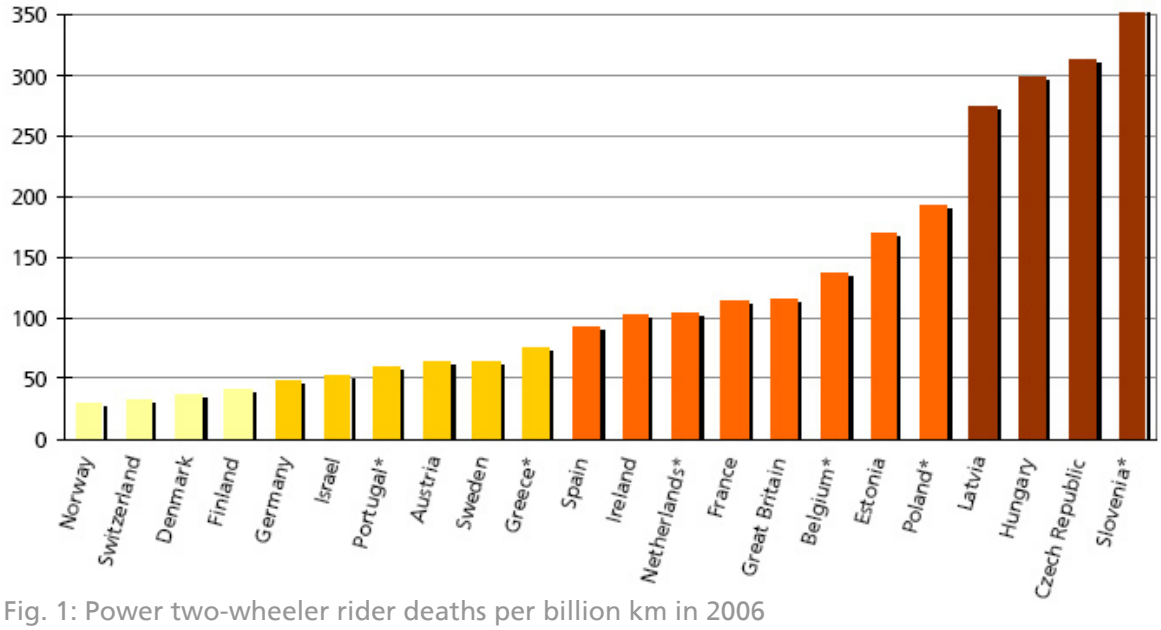

Fig. 1: Power two-wheeler rider deaths per billion km in 2006

** BE, PL and SI (2005); GR (2004); PT (2001) and the NL (2000)*

Powered Two-Wheelers (PTW)

As the diversity of two wheeled motor vehicles in Europe has increased, the general term Powered Two-Wheeler has recently been used to encompass all relevant vehicles, the main types being mopeds, scooters and full-sized motorcycles. In this report, the terms '**motorcycle**' and '**PTW**' are used **synonymously** and, except where specified, **refer to all types of such vehicles**. Differences in machines and their use between mopeds and other PTW are important and are discussed here as far as the data allow.

In recent years there has been much discussion about whether a PTW user falls into the category of vulnerable road user since they can pose risks to others such as pedestrians and cyclists. Although motorcyclists are to some extent protected by helmets and clothes, they are vulnerable road users in the sense that they are not protected by a vehicle body, seat belts or the other protection systems that car occupants enjoy, while the speed at which they move exposes them to risks of motorised traffic.

The indicator

Few studies have investigated the safety of motorcyclists and even fewer have tried to quantify their risk level. They usually express the risk of being killed by dividing the number of PTW users killed per million inhabitants, or per 100,000 motorcycles registered, or per billion PTW-kilometres ridden. The first two indicators are available for most European countries, but they take no account of exposure to risk, i.e. the number of motorcycles on the road and the distances ridden. Thus, countries with a higher number of trips by powered two-wheelers inevitably register high PTW death rates per population and may register high rates per motorcycle registered, but not necessarily high rates per distance travelled. This report therefore uses as **main indicator** the **number of PTW rider deaths per billion PTW km ridden**.

The great majority of killed motorcycle and moped users are riders. In 14 countries supplying data to SafetyNet, there are 11 rider deaths for every passenger death.[1] This Flash therefore concentrates on risk to the riders themselves and does not compare numbers of passenger deaths.

The data collected to calculate the indicators are from the national statistics supplied by the PIN Panellist in each country. The SafetyNet, Eurostat and IRTAD databases were used for verification. Altogether 22 out of the 30 countries covered under the Road Safety PIN have provided estimates of km travelled by PTW, but they use various methodologies to estimate them.[2]

(1) EU15 excl. DE. SafetyNet, WP1, Traffic Safety Basic Facts 2006 Motorcyclists and mopeds *http://www.erso.eu/safetynet/fixed/WP1/2006/BFS2006_SN-SWOV-1-3-MotorcyclesMopeds.pdf*

(2) SafetyNet, WP2, First classification of EU member states on Risk and Exposure Data *http://www.erso.eu/safetynet/fixed/WP2/D2.2.2%20First%20Classification%20of%20RED_v2.pdf*

Another way to measure the relative safety of motorcyclists is to compare it with other road users (Fig. 2). For the same distance travelled, the risk of a rider being killed in a road accident is on average 18 times the corresponding risk for a car driver[3]. The variation in this ratio among countries is also striking. In Norway it is 6 times, whereas in Slovenia it is 50 times!

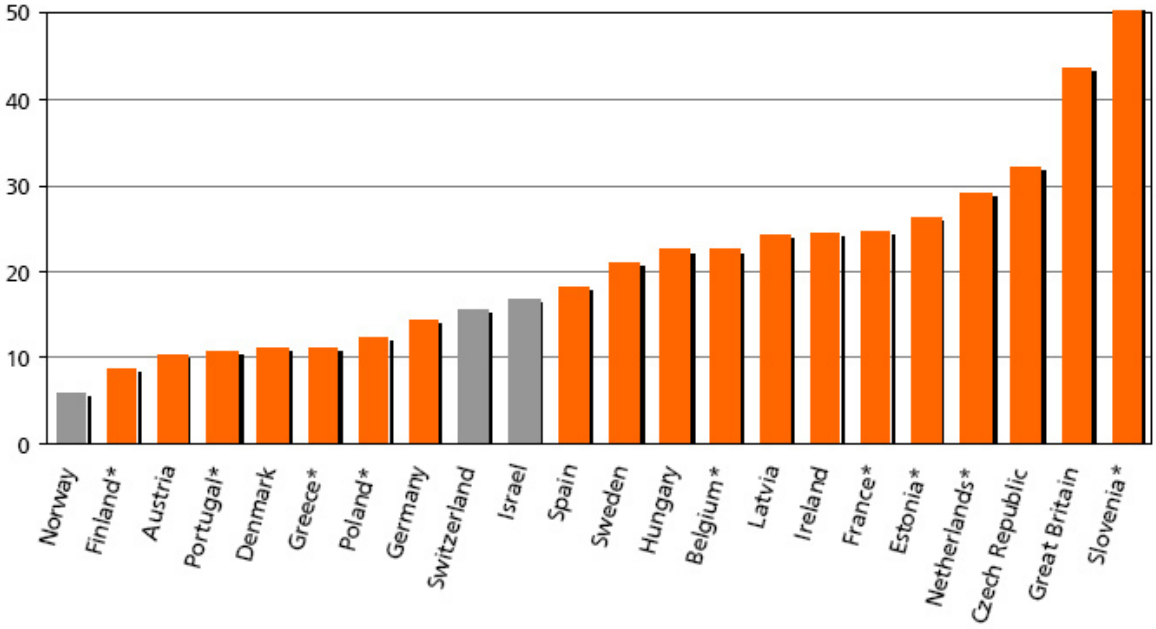

Fig. 2: Ratio of death rate per billion km ridden by PTW riders to corresponding rate for car drivers in 2006. ** PL, BE, FI, FR, EE and SI (2005); GR (2004); PT (2001) and NL (2000)*

(3) Estimation for the EU 25 excl. GR, IE, IT, LV, LT, LU, MT, NL, PT and SK

Some sources of disparity in risk

Like the risk to users of other types of vehicle, the aggregate risk for PTW riders differs between countries for many reasons other than road safety policy and measures. These other reasons include climate, topography, seasonal variation, the age-distribution of the users, and the mix of commuting, work and leisure journeys for which the vehicles are used.

But in the case of PTW riders there is another particular and substantial source of difference between countries. This is the proportion of PTW use that is formed by riding of mopeds (PTW with engine volume less than 50 ccm), which differ in characteristics and pattern of use from larger and more powerful PTW.

Comparing the levels of risk for moped riders and other PTW riders requires estimates of their separate vehicle-km travelled, which are available for only a few countries. Instead, comparison of the proportion of moped rider deaths in the total number of PTW rider deaths can help different countries to identify and prioritise safety measures for PTW.

Fig. 3 shows how the proportion of PTW riders killed who were riding mopeds differed among 22 countries over a recent 3-year period. This proportion is the lowest in **Slovenia** and **Great Britain** and the highest in **Spain** and the **Netherlands**. In other countries, moped rider deaths are between about 10 and 30 per cent of all PTW deaths.

The effect of this proportion on the levels of risk shown in Fig. 1 depends on how the risk to moped riders compares with that to other PTW riders in different countries. In 7 countries providing the required estimates of distance ridden, the risk of death per billion km ridden for moped riders ranged from about 25% to 200% of the risk for other PTW riders.

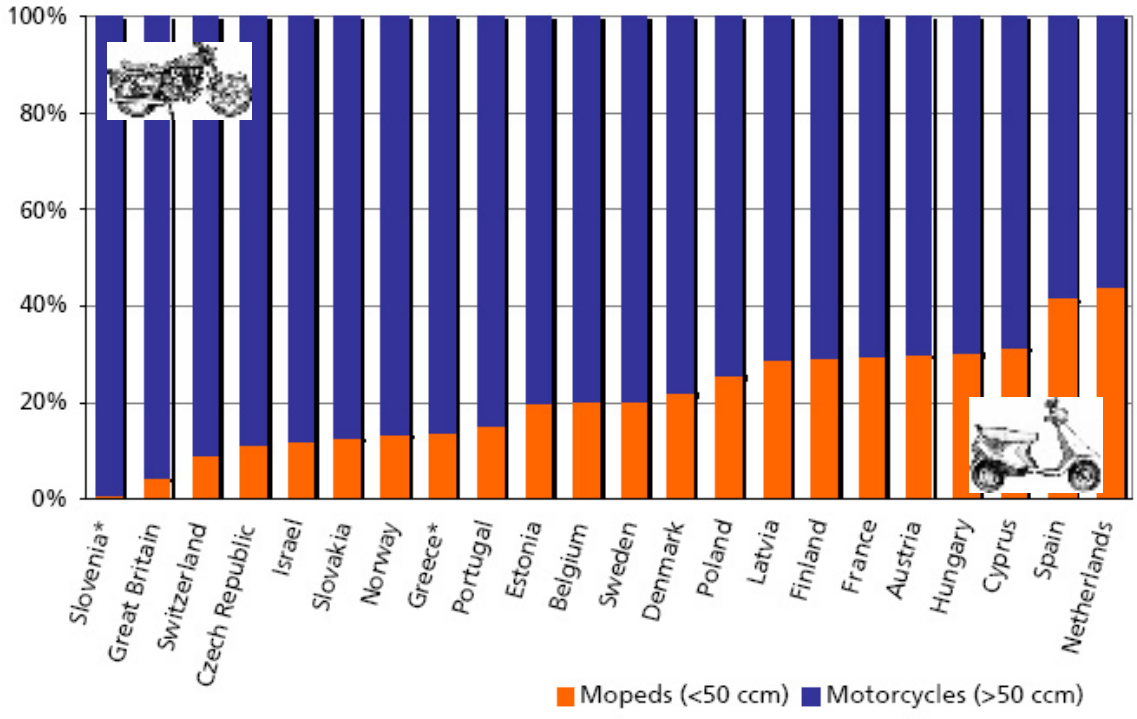

Fig.3: Mopeds rider deaths as a percentage of other PTW rider deaths over the years 2004 - 2006 * *GR, SI (2003-2005)*

Insufficient progress

In reducing motorcyclist deaths

Between 1997 and 2006, the highest reductions in PTW rider deaths were recorded in **Latvia**, **Estonia** and **Portugal** (Fig. 4). In eleven other countries, rider deaths decreased on average. In thirteen countries, however, the numbers of rider deaths rose on average over the past ten years. Taking Europe as a whole, PTW rider deaths have been stagnating between 1997 and 2006[4].

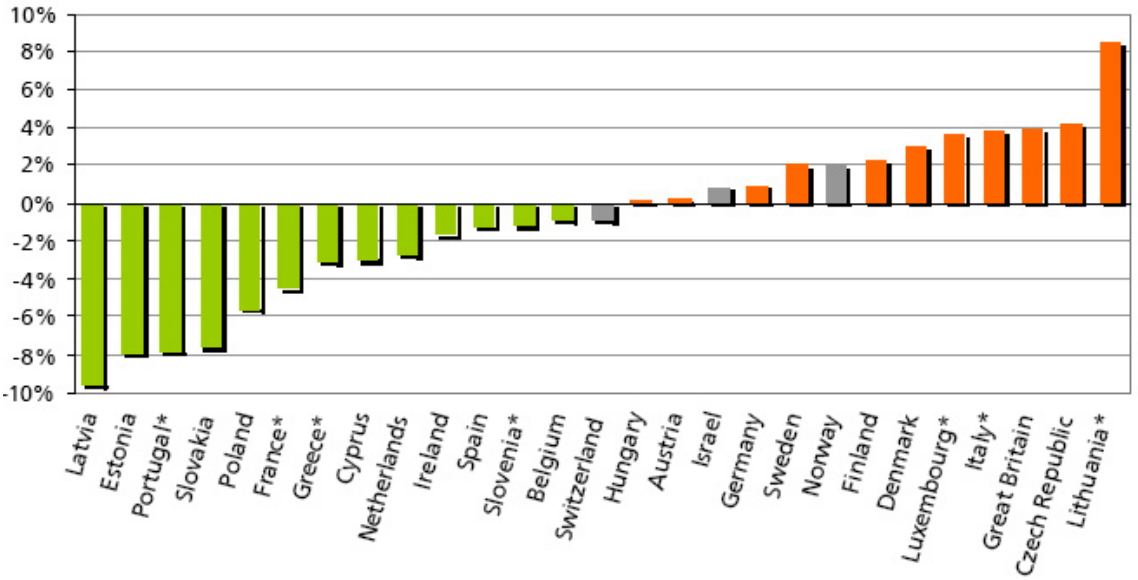

Fig. 4: Average yearly percentage change in PTW rider deaths over the period 1997-2006
** GR, SI (1997-2005); FR (2003-2006); PT (2000-2006); IT (2001-2004); LU (2001-2006) ; LT (2003-2006)*

PTW contribution to the EU reduction target

It has been estimated that to reach the EU target of halving road deaths between 2001 and 2010, a year-to-year reduction in death of at least 7.4% is needed (PIN Flash 6). Between 2001 and 2006, the reduction of PTW rider deaths is contributing fully to the overall reduction in **Portugal** and **Slovenia**. **Belgium**, **France**, **Lithuania** come close. But the average annual reduction in PTW rider deaths between 2001 and 2006 is around 1.5%[5], far less than needed for PTW to contribute their share to the European target. If this were the rate of reduction in the total road deaths, the EU would reach its target only by 2045.

Few studies have been carried out on the reasons for the difference in death reduction between motorcyclists and other road users, in particular car drivers. The argument often put forward by motorcyclists – the increase in motorcycle use – can only explain part of it.

The distance travelled by powered two-wheelers has increased by some 24% in the EU since 1996, but this is only a little more than the increase in distance travelled by cars, which has been 18%[6].

In reducing the risk of being killed

To take the increase in motorcycling into account, we looked at the average yearly changes in PTW rider deaths per billion km ridden over the same period of time (1997-2006).

Fig. 5 shows that fewer countries registered an increase in risk, namely the **Czech Republic**, **Finland**, **Hungary** and **Great Britain**. But the number of countries for which this comparison can be made is fewer than for changes in road deaths.

(4) Estimation for the EU 25 excl. FR, GR, IT, LU, MT, PT and SI
(5) Estimation for the EU 25 excl. FR, GR, IT, LT and SI
(6) Estimation based on 1996-2004 Eurostat data

Estonia and **Slovenia** appear as European champions in reducing risk to PTW riders despite the significant increase in PTW travel. Although rider deaths increased in Scandinavian countries over the past decade (Fig. 4), the risk of being killed for the same distance travelled increased only in **Finland** (Fig. 5)

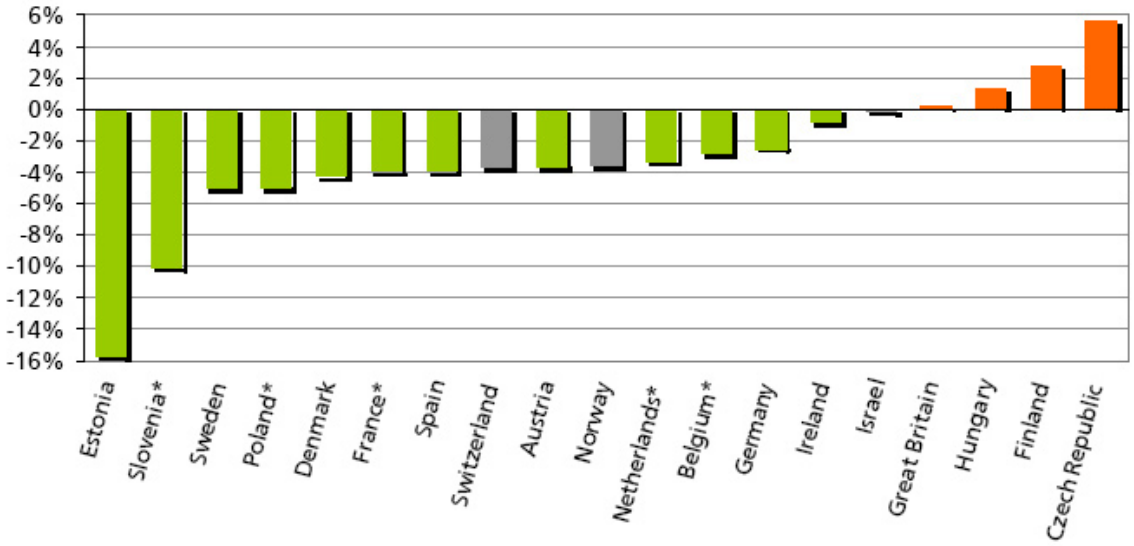

Fig. 5: Average yearly percentage change over the period 1997-2006 in PTW rider deaths per billion km ridden **BE, PL, SI (1997-2005), FR (2003-2006), NL (1997-2000)*

Background

Decision makers called to act

While riding a motorcycle will inevitably carry more risk than driving a car, evidence shows that the implementation of dedicated safety measures can substantially improve PTW safety. The measures should aim at improving the behaviour of motorcyclists, but also the behaviour of other road users and providing a safer environment for PTW riders.

Improve the behaviour of motorcyclists

The rider's skills, training, experience and attitudes are fundamental to safe motorcycling. Governments should ensure that riders receive appropriate training when they start to use a motorcycle (or re-start after a period of not motorcycling) and that they receive further training as they progress from smaller to larger machines.

Motorcyclists should be made aware of the difficulties other road users have in detecting power two wheelers and in evaluating their speed.

"We are glad to see that the general road safety improvements recorded in Switzerland over the past few years are benefiting motorcycle and moped users as well. We have implemented good practices in rider training, licensing, enforcement and infrastructure and will continue to do so. But the knowledge currently available does not allow us to explain the relative low risk Swiss riders enjoy compared to their counterparts in other countries."

Stefan Siegrist, bfu, Switzerland

Governments should develop enforcement strategies targeted at motorcyclists. Although the use of helmet is mandatory for motorcycle and moped riders and passengers in the EU, wearing rates are still well under 100% in most of the countries that are collecting data on helmet use. The rates are significantly lower for moped users than for motorcyclists. The percentage of

especially moped users not wearing a helmet, or not wearing it properly, has been stagnating, or even on the increase during the past few years in several countries.

Motorcycles generally escape safety cameras, as they are not required to have a licence plate in front and therefore in most cases remain unidentified.

In **France**, where road safety efforts have focused on moderating driving speeds, riders have reduced their speed since 2002 but not to the same extent as other road users (Fig. 6). In 2006 as least 30% of motorcyclists were still riding 10 km over the speed limit, against 15% for cars and heavy good vehicles.

Since 2006, the French government acknowledged the specific problem of overrepresentation of motorcyclists in fatal accidents and adopted a new set of measures. Safety cameras have progressively been replaced by new ones capable of catching motorcyclists from the rear and thereby allowing their identification based on registration plates. The number of mobile speed controls targeting riders also increased.

"Different factors may explain the French specificity. The riding culture has built on risk taking. Riders are slowly starting to acknowledge their responsibility. The use of protective vests and gloves is also particularly low among French riders."

Jean Chapelon, ONISR, France

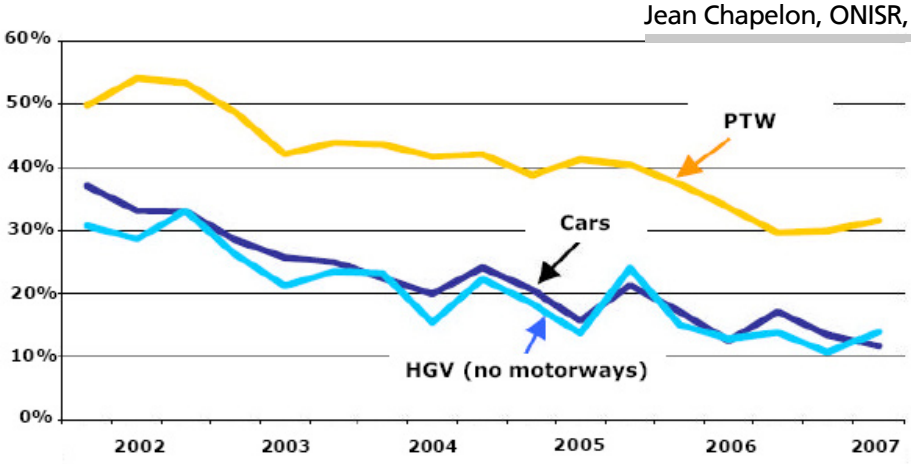

Fig. 6 Percentage of vehicles travelling 10 km above the legal speed limits. ONISR, Oct. 2007

Unsatisfactory levels of safety of PTW riders in some Central European countries can be partly explained by a poor level of enforcement and the unfavorable development in machine stock. In the Czech Republic, the share of new motorcycles has been increasing from 25% to 60% within a decade. Almost half of the bikes sold have very powerful machines with a cubic capacity over 500 ccm.

"The problem of motorcycling has been recently addressed in the revised Traffic Code. This introduced a penalty for riders hiding their registration plate in traffic in order to avoid identification. Police must now target motorcyclists who are not respecting the traffic law."

Vojtech Eksler, CDV, Czech Republic

Provide a safer environment for PTW riders

Many national and European road safety policies are targeted at car occupants and fail to take into account the specific needs of vulnerable road users.

Moreover, drivers need to be made aware of the characteristics, needs and vulnerability of motorcyclists.

The "Think Once, Think Twice, Think Bike" campaign from the UK Government urged drivers to be more alert and look out for motorcyclists, especially at junctions.

Improve the safety of the machines

Improvements to the design and construction of cars over the last 20 years have resulted in very substantial reductions in deaths and injuries on the road. This has not been the case with changes to the design of motorcycles. ABS brakes for high capacity motorbikes have been commercially available for 20 years, and are now being fitted to a wide range of machines, but penetration is still much lower than for ABS in cars.

Motorcycles are complex, powerful vehicles and there remain a number of areas where their safety performance could be further improved. In its Motorcycling Strategy of 2005, the UK Government said that it will consider the benefit of a consumer information assessment programme for PTW to assess whether it might lead to improvements in motorcycle safety in the way that the EuroNCAP programme has led to significant improvements in car design.

"Every sixth road accident victim in Spain is a motorbike rider. This is why the Directorate General for Traffic gathered all stakeholders concerned to develop a Strategic Plan for motorcycles and mopeds. The Plan prioritises 36 measures, 19 of which will be implemented in 2008"

Pilar Zori Bertolin, DGT, Spain

"Several measures have been implemented in Austria to improve the safety of motorcyclists: graduated licensing, multi-phase rider training, voluntary training courses, speed enforcement and awareness raising campaigns. Typical motorcycle routes were improved, e.g. with the installation of optimised guard rails. Yet, if Austrian riders have a relatively lower death rate ratio PTW/car drivers (Fig. 2) than in other countries, motorcyclist deaths have been stagnating over the past ten years. "

Martin Winkelbauer, KfV, Austria

The World Health Organisation and the World Bank have advised that care should be taken to avoid the adoption of policies which could encourage the growth of motorised two-wheeler traffic by giving advantages to PTW users.

"In Norway, I believe all the most cost effective measures have been implemented – mandatory helmet use, strict licensing, engine tuning ban, daytime running lights for motorbikes. The question that needs to be raised now is whether there should be any place for these motorised toys in the transport system at all"

Rune Elvik, TOI, Norway

ETSC Review "**Vulnerable riders - Safety implications of motorcycling in the European Union**" (to be published beginning of 2008) summarises the following **recommendations**:

To Member States:

- Enforce the compulsory wearing of helmets
- Install safety cameras able to detect speeding riders and enforce PTW compliance with speed limits.
- Improve rider and driver training. Rider training should focus on hazard recognition and risk assessment as well as vehicle control skills. Driver training should ensure that candidates understand the vulnerability of motorcyclists and "look out for them" when driving.
- Educate riders regarding the importance of proper fastening and provide consumer information regarding helmet safety.
- Road design and maintenance should address the specific needs of PTW users (provide good winter maintenance, use of anti-skid surfaces, forgiving roadsides).

To European Institutions:

- Further investigate the effectiveness of ABS for PTWs.
- Investigate the extent to which airbags are viable PTW safety measures.
- Motorcycles should also benefit from eCall, which is going to be introduced as a standard for passenger cars in many EU countries.
- The European research agenda should include PTW issues.

The Great Britain experience

"More older riders on the roads"

In Great Britain, powered two-wheeler rider deaths have been on the rise since 1996. The risk for British riders of being killed in traffic stands at 40 times that for car drivers. To help us understand the reasons and find possible remedies, ETSC has spoken with Samantha Jamson, Senior Research Fellow at the Institute for Transport Studies, University of Leeds (UK) and Chair of ETSC Working Party on safety of motorcyclists.

ETSC: It seems that motorcyclists do not benefit from the overall good level of road safety in the U.K. How would you explain this?

The role of motorcycling, its benefits and the concerns about its safety have been recognised by the UK government only relatively recently. In 2005, the Department for Transport published a comprehensive "Motorcycling Strategy" listing 44 measures.

Whilst riding a motorcycle used to be an alternative, cheap method of transport in past decades, nowadays its popularity as a leisure activity has increased. In addition, our research has shown that the age at which riders gain their motorcycling licence and purchase their first bike has increased steadily over the years. These recent changes also suggest that the UK roads currently have a significant proportion of motorcyclists who could either be using newly learned skills or be relying on skills that were developed some years ago and which may have subsequently degraded through lack of use. This phenomenon has also been noted elsewhere in Europe, Australia and the US.

The way in which motorcyclists build up their experience has also changed. Recent recruits to motorcycling tend to move up to powerful machines much more quickly - due in particular to higher incomes - than their younger counterparts.

> While riding a motorcycle used to be an alternative method of transport, nowadays its popularity as a leisure activity has increased.

ETSC: How do you think the situation will evolve?

Motorcycling, whether for work or leisure, is still attracting new recruits across all demographics. This is why efforts need to be stepped up in particular in the field of rider training and general awareness. Motorcycle riders, because of their inherent vulnerability, need to attain a level of skill that will enable them to ride defensively and to avoid putting themselves at unnecessary risk. Campaigns would benefit from targeting younger riders who are more likely to engage in speed-related aggressive riding and older leisure riders who tend to own larger capacity machines. Schemes such as free courses offered at the point of sale or regular refresher courses should be encouraged as well. Car drivers also need to be educated to actively search for motorcyclists in their visual field, particularly at junctions.

ETSC: Motorcycle deaths have been stagnating in Europe in general and even increasing in some Member States.

Yes, indeed, and it seems that the situation has not been reversed during the first half of 2007 unfortunately. It is particularly disturbing to read that, in Europe, PTW riders have on average 18 times the risk of being killed that car drivers have, while in GB this differential is 40 times. There is a clear call for action from governments, industry and road users to urgently improve the safety of powered two-wheelers.

Dr. Samantha Jamson is Senior Research Fellow at the Institute for Transport Studies, University of Leeds (UK) and Chair of ETSC Working Party on safety of motorcyclists. She has worked on a variety of research projects, in particular focusing on issues such as behavioural adaptation. Samantha co-wrote with Kathryn Chorlton The Older Motorcyclist, a report commissioned by the DfT.

Jamson and Chorlton (2005) The Older Motorcyclist. DfT research Report No 55.

European Transport Safety Council

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ETSC is grateful for the financial support provided for the Road Safety Performance Index (PIN) by Toyota Motor Europe and the Swedish Road Administration. The contents of this publication are the sole responsibility of ETSC and do not necessarily reflect the views of sponsors or the organisations to which the PIN Panel and Steering Group members belong.