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**Summary:**

# Road traffic risk in Norway 2009-2010

*TØI Report 1164/2011**Author: Torkel Bjørnskau**Oslo 2011, 73 pages Norwegian language*

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*The Institute of Transport Economics regularly updates the Norwegian road traffic risk figures. Estimates for the years 2009-2010 show that road traffic risk has been reduced compared to previous years. Risk levels have decreased over time for all road user groups in Norway, but the reductions are largest for motorcyclists. Nevertheless, the reductions in risk for bicyclists, pedestrians and car occupants are also substantial over time, particularly during later years. Within each road user group, the distribution of risk is fairly stable according to both age and gender. There are however substantial risk reductions for younger and older road users, especially as car drivers and pedestrians. Finally, by distributing according to day of the week and time of day, we find that injury risks for car drivers and passengers are extremely high on Saturday night/Sunday mornings.*

## Accident and risk decrease over time in Norway

The Institute of Transport Economics regularly estimates road traffic risk in Norway using official accident data from Statistics Norway and Norwegian Travel Surveys.

Although the total annual number of accidents and injuries has been fairly stable from the mid-eighties to around 2007, it has declined in later years. In contrast the annual number of Norwegian road fatalities has declined from 1986 onwards. During the last decade the latter number has almost been halved (Figure S1).

The risk of being involved in an accident with personal injury, the risk of injury and the risk of fatality have all decreased over time in Norway (Figure S2). The risk reductions were large in the 1980s and steady during the 1990s and mid 2000s. More recently, from 2007 to 2010, we see again a large reduction road traffic risk in Norway.

Risk levels have decreased over time for all road user groups in Norway, but the reductions are largest for motorcyclists, and most notably for users of heavy motorcycles (cf. Figure S3). The main reason why users of heavy motorcycles are safer is probably that this driver group is more mature and experienced now than it was in the 1980s.

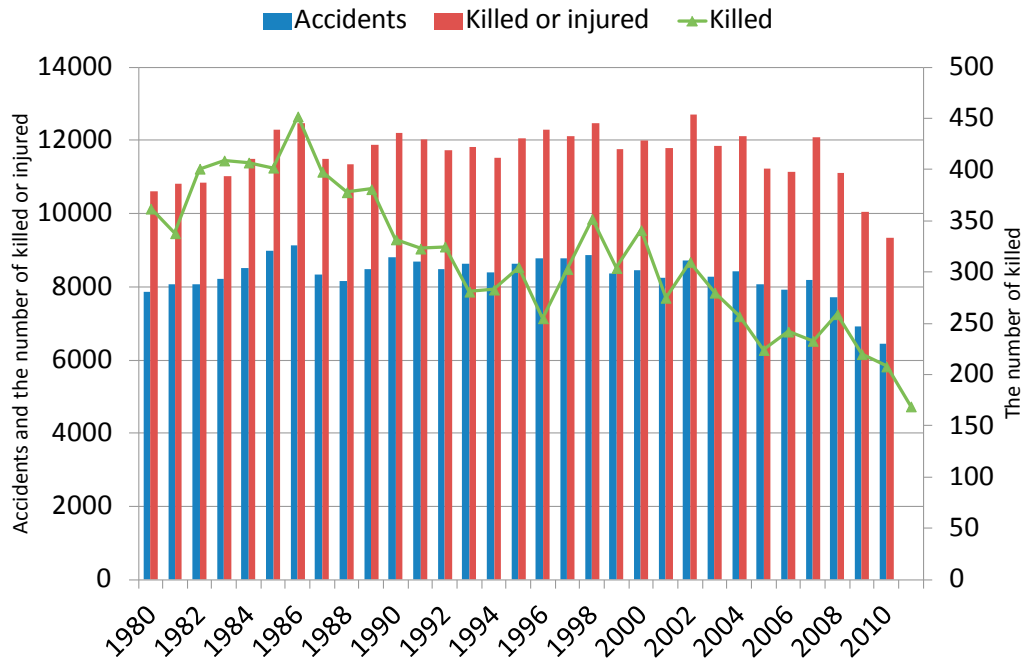


Figure S1 Accidents, injured or killed, and killed in Norwegian road traffic 1980-2010 (2011 for killed).

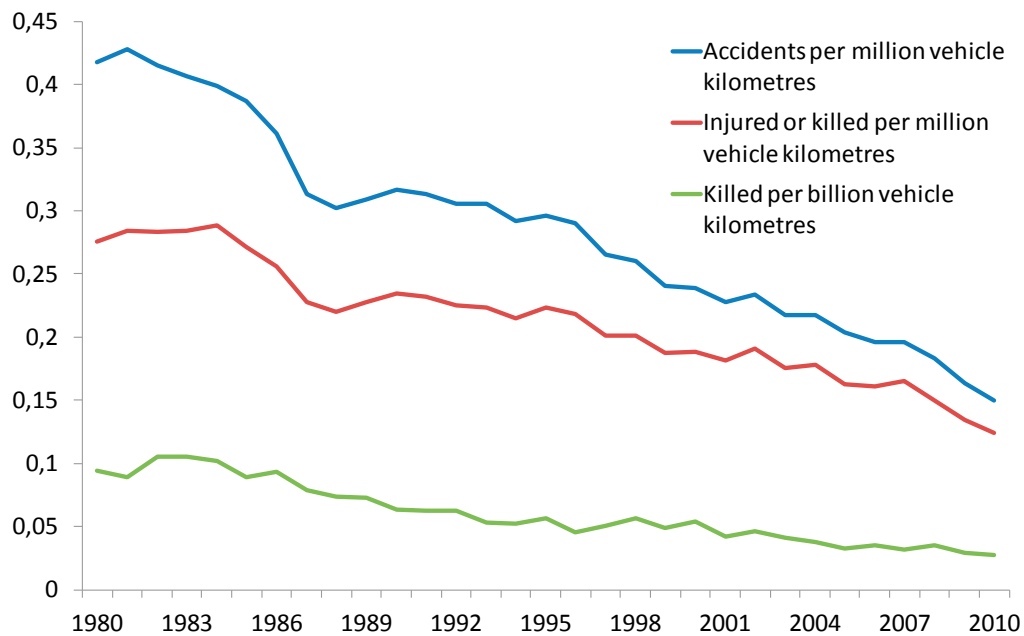


Figure S2 Accident risk, injury risk and fatality risk in Norwegian road traffic 1980-2010.

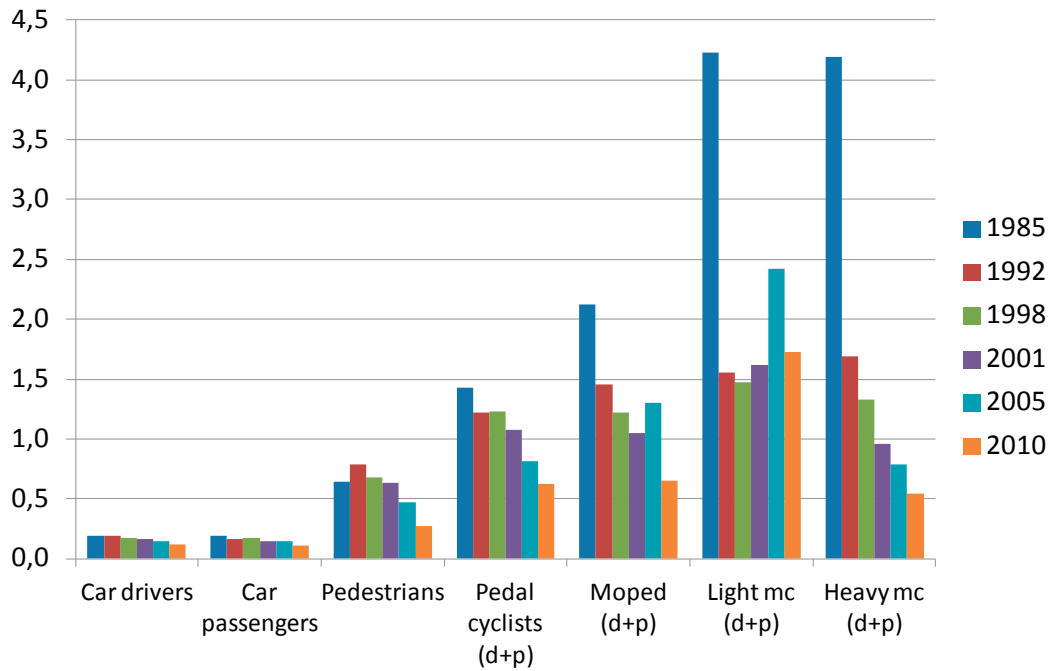


Figure S3 Number injured or killed per million person kilometres in Norway in 1985, 1992, 1998, 2001, 2005 and 2009-2010 by road user group. (d+p) indicates drivers and passengers.

For all road user groups the reductions in risk over time are substantial. They are particularly large over the last five years, from 2005 to 2010.

### The young and the elderly are most at risk

Among car drivers the young and the elderly have higher accident risk, with youngest drivers being most at risk. Among pedestrians and pedal cyclists, it is the elderly who are most at risk. The risk of fatality as a pedestrian is particularly high among the elderly cf. figure S4.

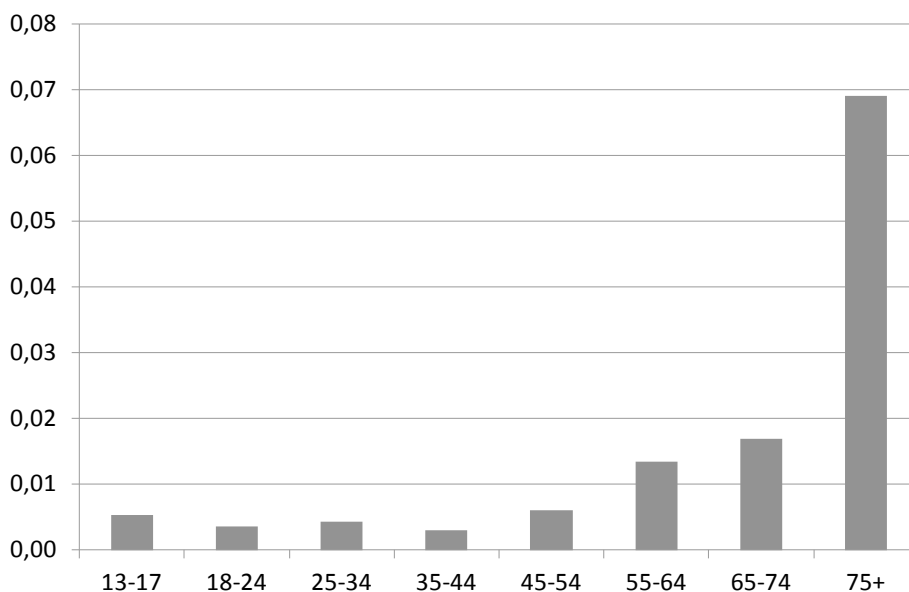


Figure S4 Pedestrians killed per million person kilometres in 2009-2010, distributed by age.

Among car drivers young people are traditionally most at risk, and this is still the case. In particular the very youngest car drivers (18-19 years) have an increased risk of an accident involving serious personal injury or death. The average injury risk for car drivers is much more evenly distributed according to age, a pattern which has remained remarkably stable over time cf. figure S5.

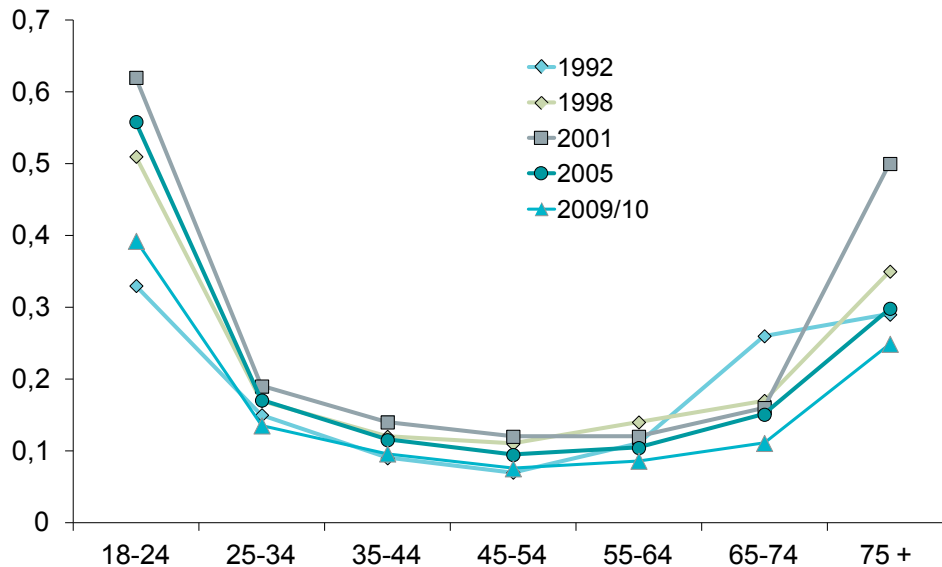


Figure S5 Car drivers killed or injured per million person kilometres distributed by age in 1992, 1998, 2001, 2005 and 2009-2010.

## Risk differs between men and women

Among car drivers there are risk differences between men and women. Male drivers have a higher risk of being killed in road traffic than female drivers do. On the other hand female drivers are more at risk of having a personal injury. The reason for these differences is probably that accidents involving male drivers on average take place at higher speeds and consequently are more serious than those involving female drivers.

If one considers the risk of being involved in an accident with personal injury, regardless of whether the injured party is the driver or not, male and female drivers are on average at risk to the same degree. There are however clear differences both among age groups and between genders within age groups, cf. figure S6.

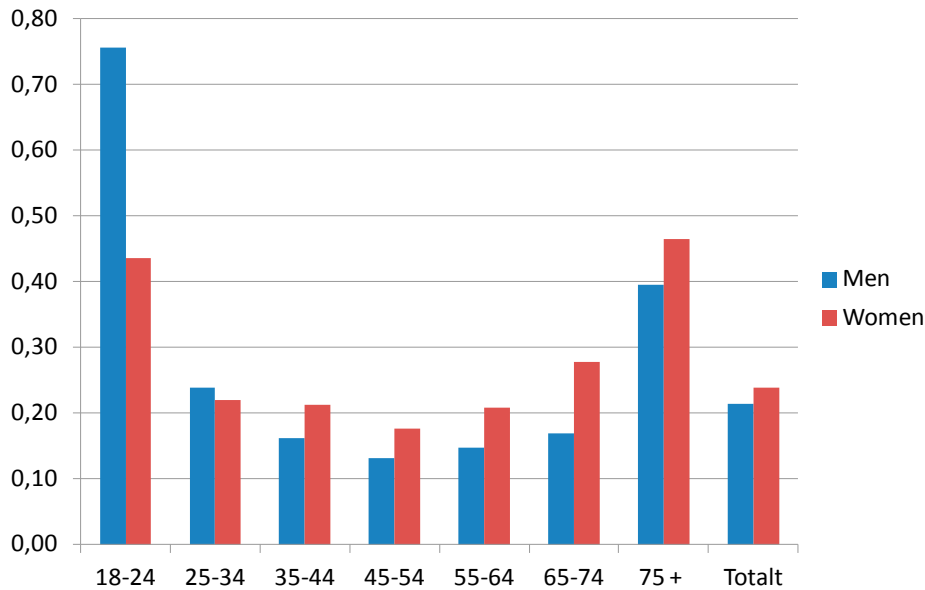


Figure S6 Car drivers involved in accidents with personal injury per million person kilometres, distributed by age and gender, 2009-2010.

The risk of being involved in an accident with personal injury has an age distribution that is similar in its U-shape to the risk of being killed or injured as a car driver (given in figure S5).

### High risks on Saturday night/Sunday morning

If we look at the injury risks for car drivers and passengers on different days of the week and at different times of day, we find that the risk is extremely high in the early hours of Sunday morning cf. figure S7.

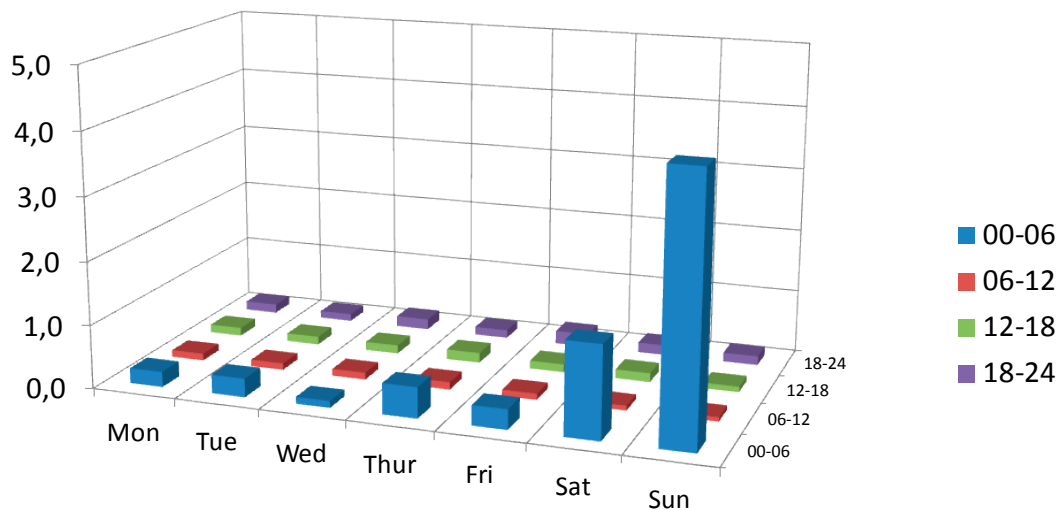


Figure S7 Car drivers and passengers killed or injured per million person kilometres by day of week and time of day in 2009-2010.

Similar results were found also in 1998, 2001 and 2005. Relative to overall risk, injury risk is more than 30 times greater in the early hours of Sunday mornings. The reason why this injury risk figure is so extreme is probably that it is a time when a lot of young inexperienced drivers are on the roads, with a relatively high proportion of road traffic on small, badly lit local roads, and with a higher than normal proportion of drivers driving under the influence of alcohol and/or drugs.

## Methodology

In order to calculate the risk figures, average travel distances per day for various combinations of road user, age and gender are computed. These average values are extrapolated to represent a whole year (each day multiplied by 365) and to represent the whole population (averages multiplied by population numbers within each age/gender combination).

Accident figures collected from Statistics Norway are distributed according to similar age/gender/road user groups, and risk is computed by dividing the accident/injury/fatality numbers by the exposure figures.

For large groups such as pedestrians and car drivers, this method is fairly robust. For combinations of road user/age/gender containing few cases there can be large random variations in both the accident data as well as in the exposure data. There are for instance large random variations in the risk estimates for the youngest drivers. Thus in order to give more robust results 18-19 year-olds have been grouped together with 20-24 year-olds in the figures.

For small road user groups like motorcyclists, the exposure data collected in the Norwegian national travel survey are so scarce that they cannot be utilized to calculate risk figures. For motorcyclists and moped users, risk calculations are based on "Transport Volumes in Norway" published by The Institute of Transport Economics. Here exposure data for motorcyclists and moped users are calculated using survey estimates of annual mileage and vehicle register data for the number of vehicles. Thus for motorcyclists and moped users detailed risk figures distributed by age/gender are not available. For motorcyclists the estimates are based on recent surveys, but for moped users the surveys that serve as basis for the calculations are old and need updating. Thus for moped users the risk figures are more uncertain.

## Conclusion

The reductions in risk during later years are larger than they have been for many years. In spite of improvements in the absolute level of risk, the relative variation in risk by age and gender remains fairly stable.

A consistent reduction in the level of risk over time is not surprising given the fact that road safety measures are constantly improved, both in the road system and not least with respect to the passive safety of vehicles. However, the very large decrease we see in later years is difficult to explain. It coincides with lower speeds on the roads, and tendencies towards better safety attitudes among road users according to recent surveys. Thus, there are indications of an improved safety culture on Norwegian roads.