

Summary

Road traffic risk in Norway 2017/18

TOI Report 1782/2020

Author: Torkel Bjørnskau

Oslo 2020 74 pages Norwegian language

The Institute of Transport Economics regularly updates the Norwegian road traffic risk figures. Estimates for the years 2017-2018 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 car occupants and motorcyclists. Within each road user group, risk levels are still highest among the younger and older road users, but for both age groups there has been a marked risk reduction in particular among young car drivers and car occupants. For cyclists, there is a large underreporting in the official figures and cyclists have the most injuries of all road user groups according to the Norwegian Patient Registry.

Finally, by distributing according to day of the week and time of day, we find that injury risks for car drivers are much higher on Saturday night/Sunday mornings, but the risk increase at night/weekends is lower than previously.

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 substantially in later years. In contrast the annual number of Norwegian road fatalities and seriously injured 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 onward, we see again a large reduction in road traffic risk in Norway.

Risk levels have decreased over time for all road user groups in Norway, but the reductions are the largest for users of mopeds and heavy motorcycles (cf. Figure S3).

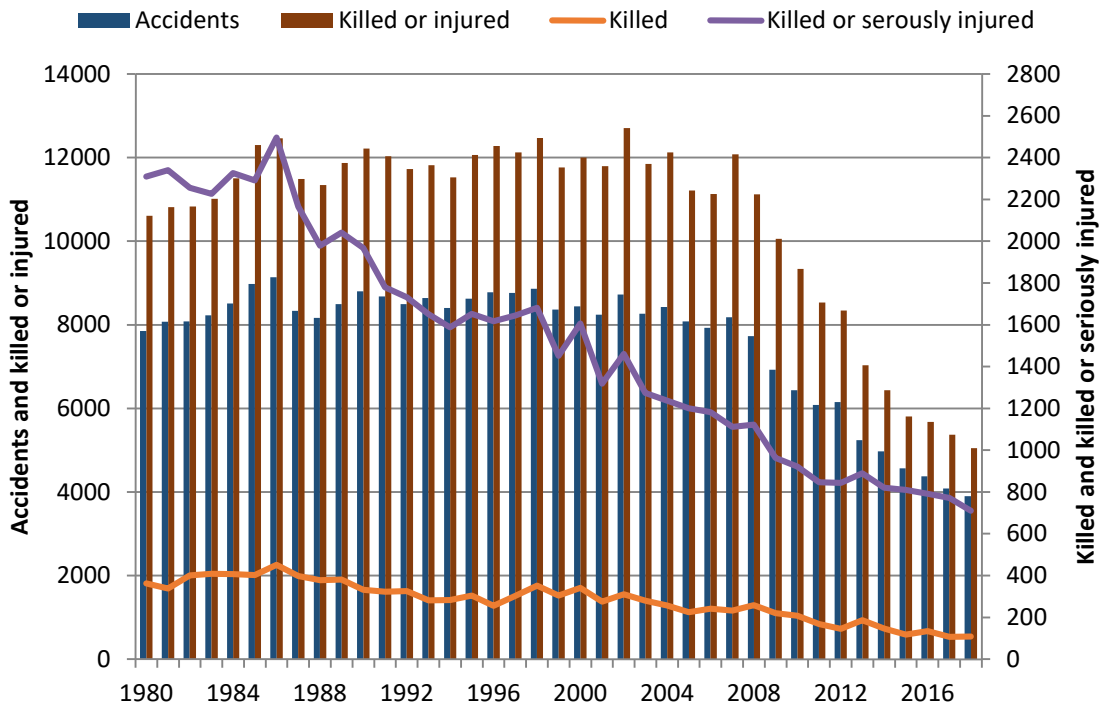


Figure S.1: Accidents, killed or injured and killed or seriously injured in Norwegian road traffic 1980-2018.

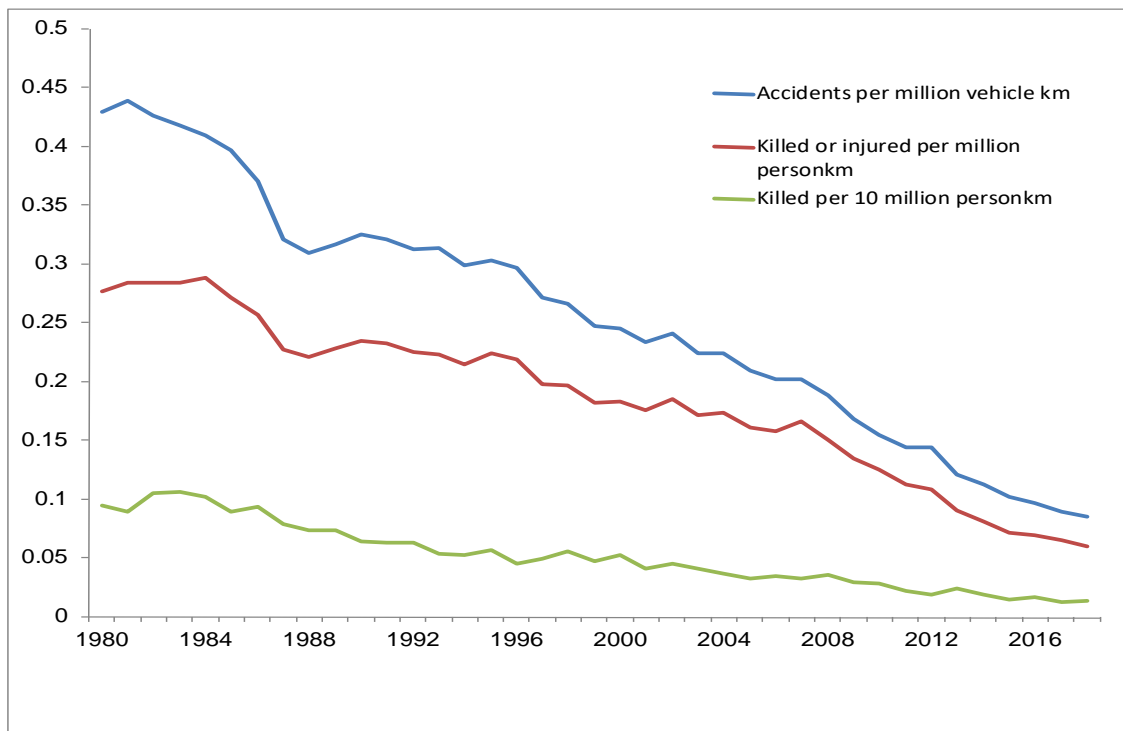


Figure S.2: Accident risk, injury risk and fatality risk in Norwegian road traffic 1980-2018.

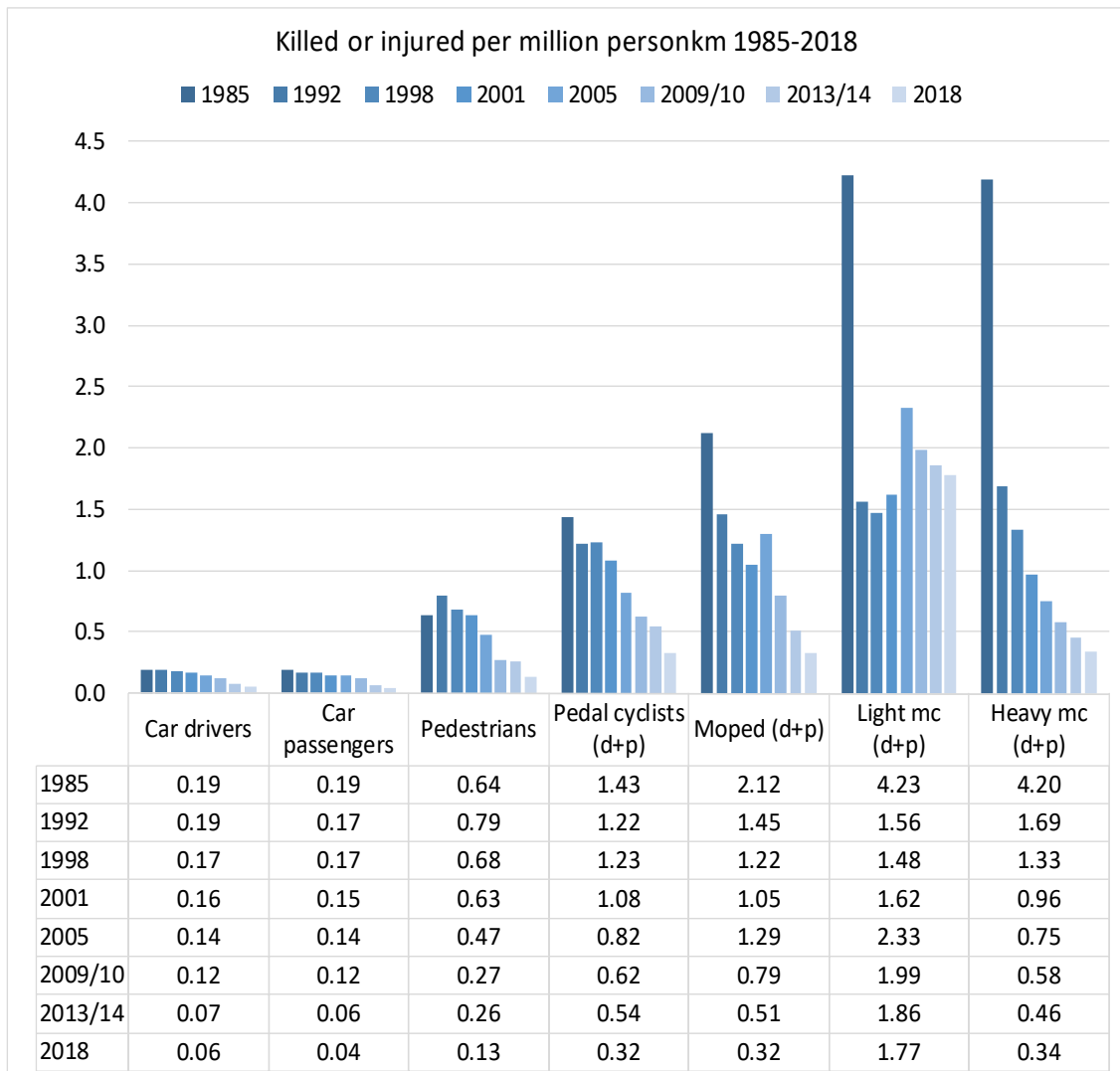


Figure S.3: The number of injured or killed per million person kilometres in Norway in 1985, 1992, 1998, 2001, 2005, 2009/10, 2013/14 and 2018 by road user group. (d+p) indicates drivers and passengers.

For all road user groups the reductions in risk over time are substantial. For motorcyclists the reduction from the 1980s is dramatic. For the other road user groups there has been a steady reduction throughout the period.

The explanation for the dramatic risk reduction for heavy motorcycles from the mid-eighties onward is probably that this type of vehicle was typically driven by young and immature men in their mid-twenties in the 1980s whereas today the average age of heavy motorcycle drivers is around fifty years.

The young and the elderly are most at risk

Among car drivers the young and the elderly have higher accident risk. Among pedestrians and pedal cyclists, the elderly are most at risk. The risk of fatality as a pedestrian is particularly high among the elderly cf. figure S4. There were in fact no killed pedestrians below the age of 25 in Norwegian road traffic in 2017 or 2018. Thus, the risk estimates are zero.

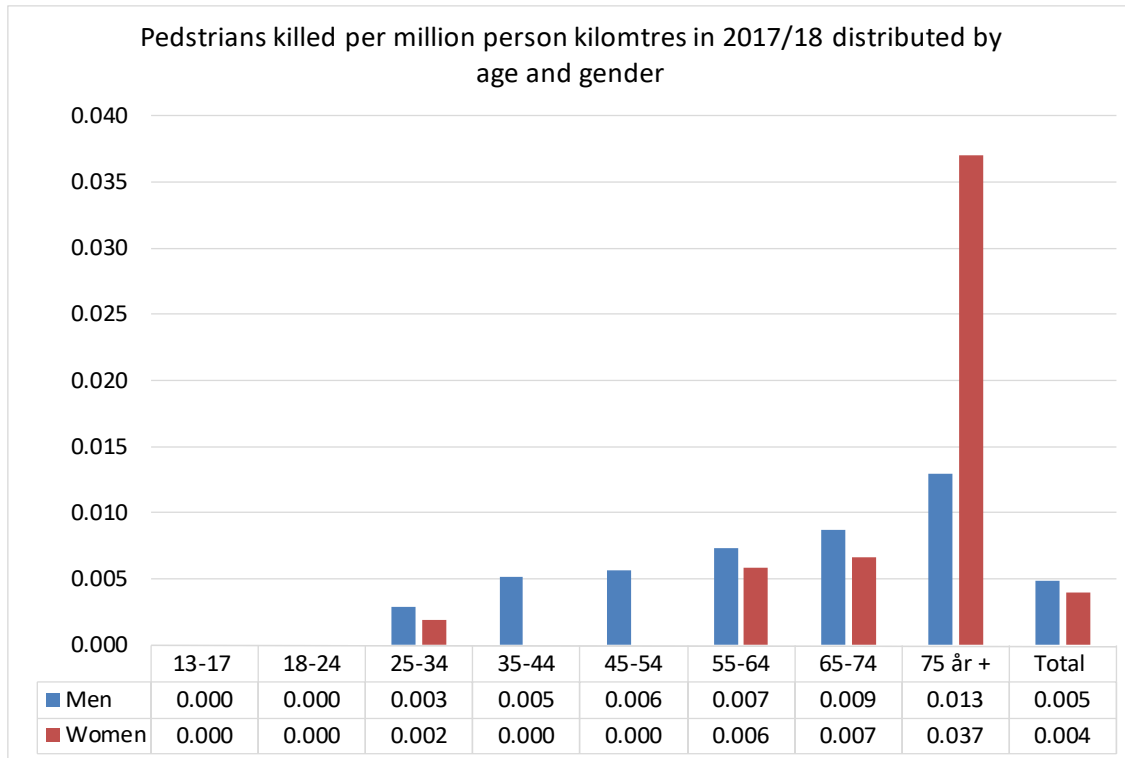


Figure S.4: Pedestrians killed per million person kilometres in 2017/18 distributed by age and gender.

The average injury risk for car drivers is much more evenly distributed according to age, but with higher risks among the younger and the older drivers. However, the variation by age has become much smaller over time, cf. figure S.5.

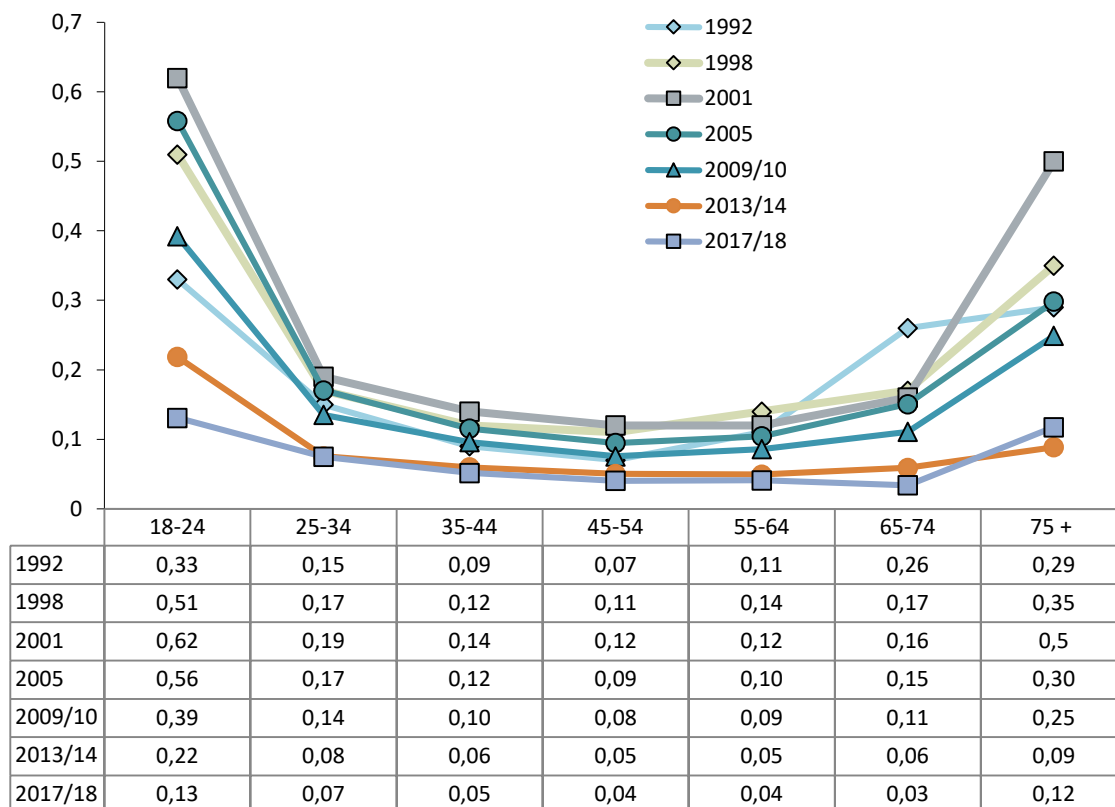


Figure S.5: Car drivers injured or killed per million person km distributed by age and year.

Risk differences between men and women

Among car drivers there has traditionally been marked 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 among age groups but small differences between genders within age groups, cf. figure S6.

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 S.5).

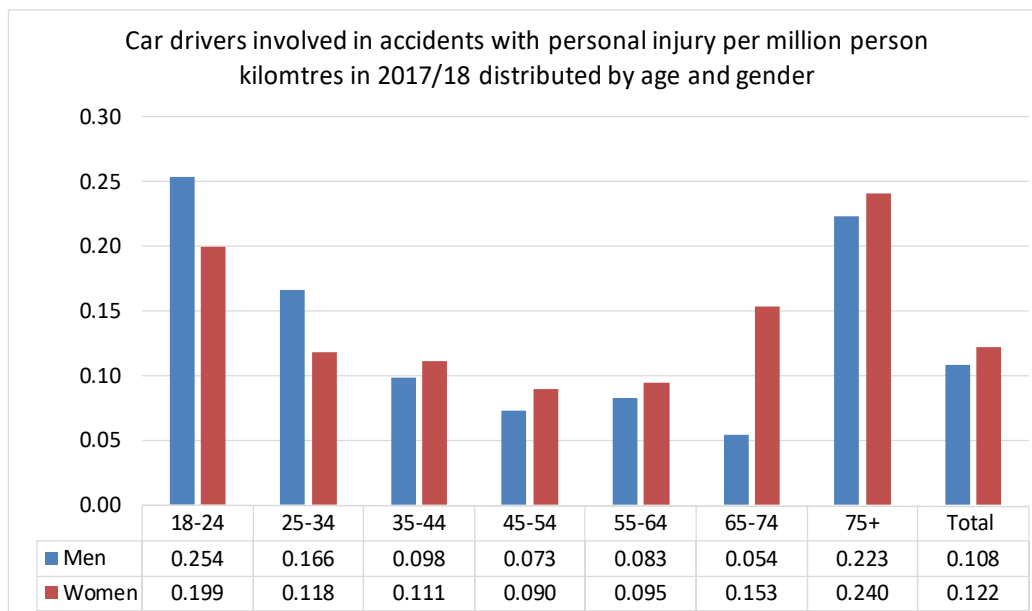
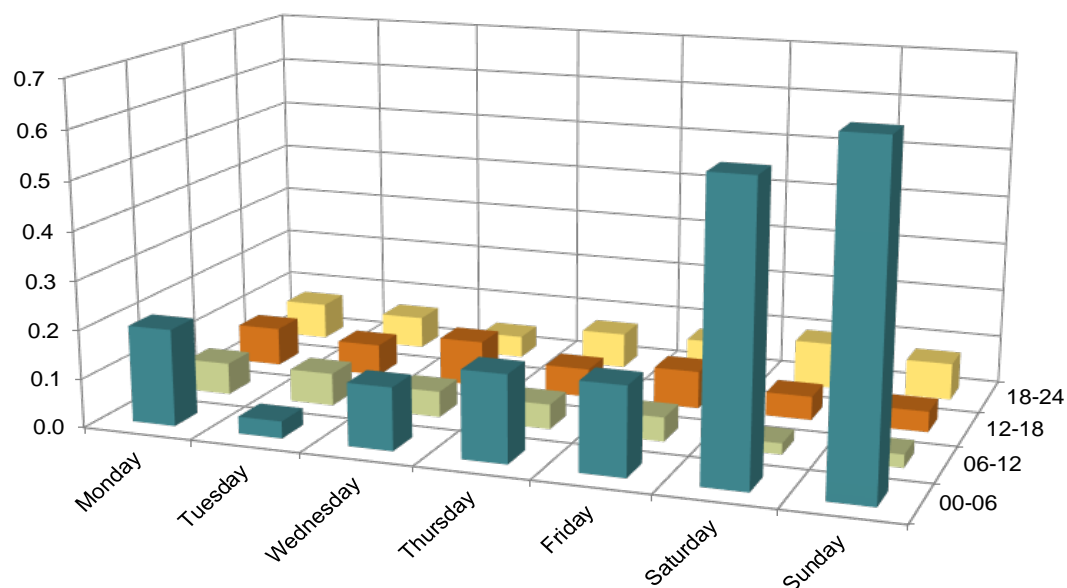


Figure S.6: Car drivers involved in accidents with personal injury per million person kilometres, distributed by age and gender, 2017/18.

High risks on Saturday night/Sunday morning

If we look at the injury risks for car drivers on different days of the week and at different times of day, we find that the risk is very high in the early hours of Sunday morning cf. figure S.7.

Car drivers injured or killed per million personkm in 2017/18 distributed by day week and time of day



	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
■ 00-06	0.20	0.03	0.13	0.18	0.18	0.59	0.68
■ 06-12	0.07	0.07	0.05	0.05	0.05	0.02	0.03
■ 12-18	0.08	0.07	0.09	0.06	0.08	0.05	0.04
■ 18-24	0.08	0.07	0.05	0.07	0.08	0.09	0.08

Figure S.7: Car drivers involved in accidents with personal injury per million person kilometres, distributed by age and gender, 2017/18.

Similar results were found also in 1998, 2001, 2005, 2009/10 and 2013/14. However, relative to overall risk, injury risk is more than 30 times greater in the early hours of Sunday mornings in 2009/10; 12 times greater in 2013/14 and 11 times greater in 2017/18.

The traditional high risk in the early hours of Sunday mornings can to a large degree be explained by the fact that driving during these hours has been associated with young and immature drivers, possibly influenced by alcohol and drugs. Now it seems that in particular the risk of young drivers is substantially reduced compared to previous years, and associated with this there has also been a substantial decrease in the number of accidents with young car occupants at night.

Many factors contribute to reducing risk

Risk calculations show that traffic has become much safer over time, and especially in recent years there has been a marked risk reduction in road traffic in Norway, especially for young drivers and passengers. Compared with the risk level in 2013/14, the young drivers (18-24) have more than 40 percent lower risk of being injured as car drivers.

One mechanism that may have contributed to this is that the car fleet is becoming safer, and this has probably also been reflected now in older cars typically driven by younger drivers. Another trend is that young people tend to use car-sharing schemes and car hire to a larger degree than before, and hence often drive new and safe cars. Also, the Norwegian

penalty point system, being especially strict to young drivers, has probably contributed to the risk reduction.

Parallel with the improvements in the cars' crash protection the road authorities continuously and systematically improve the road network providing better road user protection with physical barriers separating traffic, concerting intersections to roundabouts, building bypass roads around cities and towns etc. Another important factor may be that emergency medicine is constantly improved and that notification of ambulance accidents happen more quickly than previously. In addition, the speed on the roads has decreased in recent years. It may be because the motorist population gets older, it may be due to effects of traffic controls, the penalty point system etc. Surveys of road user attitudes and behavior shows a tendency towards more acceptance of security restrictions in speed limits, more people use safety equipment etc. It seems we are on the way to achieving a better safety culture in traffic in Norway.

Appendix: Methodology

In order to calculate the risk figures, travel data from the Norwegian national travel survey have been used. 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.