



Cycling in the dark more dangerous than in daylight

The risk for cyclists of being injured in a crash is highest in the dark. This is the case for cyclists of all ages. This is the outcome of a SWOV study into the hazards of cycling under the light conditions daylight, dusk and dark.

No previous research was done in the Netherlands into the risk of cycling during dusk or in the dark. This is one of the reasons why it cannot yet be determined how much bicycle lights contribute to road safety, or, in other words: how many casualties are saved among cyclists due to bicycle lighting. This, and a question from the Dutch bicycle and passenger vehicle organisation RAI Association, were reason for SWOV to investigate the risks of cycling under different light conditions.

Study design

The crash, casualty, and mobility data which SWOV has access to were used in the study, supplemented with data about the time of sunrise and sunset per day. Not all injured cyclists, but only those meeting the 'serious road injury' criterion (MAIS2+), were included in the analyses. Dividing the number of casualties

by the distance cycled (in millions of kilometres) gives the so-called casualty rate per light condition: the higher the casualty rate, the more casualties there are per kilometre cycled. When the casualty rate is higher for specific light conditions, this could mean that cycling under those light conditions is more hazardous. Another explanation, however, could be that the cyclists who travel under those specific light conditions always have a higher casualty rate, independent of the light conditions. Therefore, the casualty rates were calculated for certain groups of cyclists, more in particular for different age groups. The rates were also determined for the days of the week and the four seasons.

Crashes

Most of the seriously injured cyclists, those in crashes involving motorized vehicles as well as those in crashes not involving motorized

vehicles, were involved in a crash during daylight. This was to be expected, because cycling is done most during daylight. But relatively speaking there are more cyclist casualties in the dark than during daylight. During the period 1993-2008, the percentage of cyclists who are seriously injured in crashes involving a motorized vehicle in the dark fluctuates between 14% and 17%. For seriously injured cyclists in crashes not involving a motorized vehicle the percentage increased from 13% in 1993 to 23% in 2008. However, only 10% of the cycled distance is travelled in the dark. It must therefore be concluded that in the dark the risk is higher for cyclists than it is during daylight.

All ages

If we consider the casualty rates per age group and light condition, the casualty rate is highest in the dark for all age groups. It may therefore be concluded that the risk is higher for cycling in the dark than for cycling during daylight because cycling in the dark is indeed more unsafe and not because those cyclists who travel in the dark always have a higher casualty rate. It was

also found that cycling in the dark is particularly unsafe for 18-29 year-olds (compared with their total risk). There are strong indications, however, that for this group it is not only the dark, but also the use of alcohol that plays a role in the high casualty rate. In 1993, for instance, according to the hospital registration 24% of the 18-24 year-old cyclists who were seriously injured on a weekend night in a crash not involving a motorized vehicle had used alcohol. Their percentage increased to 58% in 2008. Also the 25-59 year-olds have a relatively

high and increasing percentage of alcohol use: 21% in 1993 and 44% in 2008.

Lights

The relation between using bicycle lights (and its quality) and the risk of cycling in dusk and dark has not been investigated in this study. Indeed, this is hard to investigate because it is not known whether or not cyclists who were involved in a crash had working lights on their bicycle.

The following SWOV publications are available about cycling in general and about cycling in the dark:

M.C.B. Reurings (2010). [Cycling in the dark: how dangerous is it?; Analysis of bicycle crashes](#). R-2010-32

Factsheet [Cyclists](#)