



Aim

The aim of this poster is to summarize two studies on night driving, sleepiness and driving safety.

Conclusion

The risk for a car accident is about 6 times higher at the late night hours (04.00h) compared to daytime. During the late night hours physiological sleepiness peaks and driving performance deteriorates. Thus, driving at night is a strong risk factor for sleep-related car accidents.

Time of day pattern

Sleepiness and fatigue accounts for 15-30% of all vehicle accidents and is therefore considered to be one of the most important determinants to traffic safety.

Official accident and traffic density statistics were used to compute the relative risk (odds ratio=OR) of being injured or killed in a traffic accident at different times of day. Accidents due to alcohol were removed. The highest total risk was seen at 04h (figure 1). Single-vehicle accidents showed the same diurnal trend, however, the OR (=12) was considerably higher.

It was concluded that early morning driving is several times more dangerous than driving during daytime, and it is likely that the night time effect is related to sleepiness. (Åkerstedt et al, 2001)

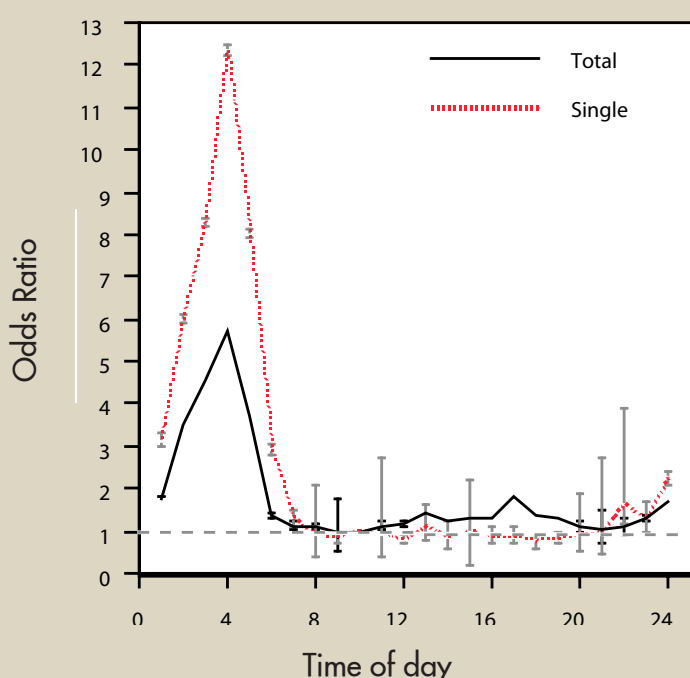


Figure 1. Odds ratio for being involved in a highway accident (n=10344) at different times of day.

References: Åkerstedt T, Kecklund G, Hörte L-G. Night driving, season, and the risk of highway accident. *Sleep*, 2001, 24: 401-406.

Night driving, sleepiness and driver impairment

This study compared physiological sleepiness and driving performance during an alert condition (early evening) and during a sleepy condition (night driving).

The study was carried out in a moving base car simulator and involved 19 drivers. The results showed that physiological sleepiness (Karolinska Drowsiness Score=KDS), increased during night driving (mean time with sleepiness: evening=33%, night=53%, $p<0.01$). Lane variability, an indicator of driving impairment, also increased during night driving.

Lane departures (near accident) during the night condition increased when sleepiness became more pronounced (see figure 2), which suggests a strong correlation between driver impairment and sleepiness. (Anund et al.)

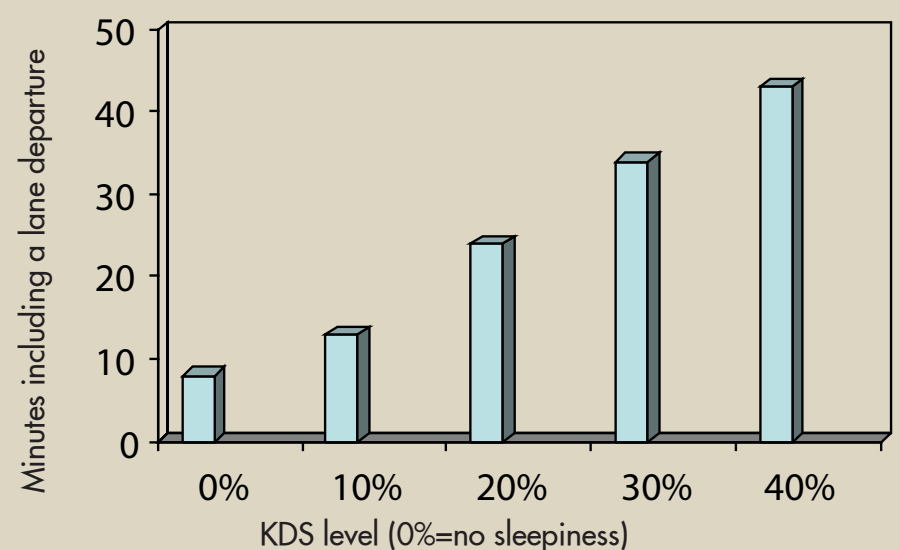


Figure 2. Minutes including a lane departures for different levels of sleepiness during the night condition.

References: Anund A, Kecklund G, Peters B et al. Driver impairment during night and the relation with physiological sleepiness. *Scand J Work Environ Health*, in press.