The Impact of Sleep Disorders on Traffic Safety

Professor. Damien Leger
There are two kind of sleep problems which may affect road safety

- **In the general population:** too short sleep and sleep deficit, sleep debt.

- **In patients:**
  - Sleep disorders: *insomnia, sleep apnea, hypersomnia*
  - Sleep medications
The Impact of Sleep Disorders on Traffic Safety

- In the last decades several studies have shown that sleep quantity and quality problems may increase specifically the risk of accidents

- Sleep debt (one hour lost/24 hours) RR 2,2
- Insomnia (3X/ week / > 1 month) RR 1,8
- Sleep apnea (IAH>10 /h) RR 3,4
- Psychotropic use a abuse RR 3
- Narcolepsy, hypersomnia RR 8
- Shift work - night work RR 4,5
There are two kinds of sleep problems which may affect road safety.

The role of too short sleep, sleep deficit, sleep debt.
The time devoted to sleep has drastically dropped in most of the Countries.

<table>
<thead>
<tr>
<th>Country</th>
<th>Total Sleep Time (h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Netherlands</td>
<td>7,53</td>
</tr>
<tr>
<td>Poland</td>
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<td>Slovakia</td>
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<td>China</td>
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<td>US</td>
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<td>Malaysia</td>
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</tbody>
</table>

SURVEY TNS SOFRES IKEA 2008, n=13657
Total sleep time during working days in 24 countries (17 EEC) over the world.
In the last 5 years did you slept less or more?

- Less: 36%
- More: 14%
- The same: 49%
- No answer: 1%

SURVEY TNS SOFRES IKEA 2008, n=13657
Total sleep time during working days in 24 countries over the world

36% sleep less than 5 years before
In the last 5 years did you slept less or more?

SURVEY TNS SOFRES IKEA 2008, n=13657
Total sleep time during working days in 24 countries over the world
Determinants of Short Sleep (<6 hours/24 h)

- Shift work and night work
- Time for connection between work and home
- Leisure time with internet and video games

Consequences of Too Short Sleep

- Sleepiness at work and at the wheel
- Rate of accidents × 2 at × 3
- Prevalence of obesity, diabetes, and cardiovascular diseases
Sleep disorders which affect road safety

Sleep disorders, insomnia, sleep apnea, hypersomnia and psychotropic use
Insomnia Affects Severely 6 to 10% of European Adults and its Prevalence increase with time

Prevalence of insomnia in France in the last 30 years
INSEE annual sample
EQUINOX survey in 5293 subjects with insomnia in general practice from ten countries. Leger et al JSR 2013, who report at least one accident in the past two years

Subjects complaining of insomnia in GP
n=5239

Part-time or full-time workers
n=3350

Home accidents
n= 1086
(20.86%)

Work accidents
n= 448
(13.57%)

Driving license
n=2983

Car accidents
n= 207
(7.03%)

Fallen asleep
While driving
n= 459
(15.6%)
The use of Psychotropic Drugs is an Unrelated Risk of Accidents due to Sleepiness: 15% of adults take PD on a regular basis

Type of psychotropic drug taken in four countries

Adapted from Monteiro et al, BMC Public Health, 2012, 12:59 with permission
Untreated sleep apnea also increase the risk of accidents by 3 to 4.

Snoring, non refreshing sleep, sleepiness, associated cardiovascular diseases.
The ESRS meets the Members of the European Parliament

Night Work, Shift Work and Sleep Debt

- The longer you are awake
- The highest the need of sleep

17 hours of wake \( (awake \ at \ 8 \ and \ in \ bed \ at \ 1 \ am) \)
\[ \rightarrow 0.5 \ g \ alcohol \ blood \ rate \]

24 hours of wake \( (awake \ at \ 8 \ and \ in \ bed \ at \ 1 \ am) \)
\[ \rightarrow 1 \ g \ alcohol \ blood \ rate \]

Night work increases the risk of accidents \( x \ 4.5 \)
An Accident has always multiple causes.
Sleepiness Increases the risk by Several factors

In board technology attention

Monotonous driving

Sleep debt

Travel connection time

Night work Shift work

Sleep disorders And drugs
Sleepiness and Accidents

Which initiatives have been made in Europe?

- The DRUID Study on psychotropic and driving
- The LAST campaign with Belgium and Greece on young drivers
- The coming projects EUROFOT, PROLOGUE, ITERATE
Sleepiness and Accidents

What we recommended “white paper on sleepiness at the wheel”

1. Improve the information on sleepiness for drivers

2. Better identify, deaths and accidents due to sleepy driving

3. Educate drivers with a mandatory course on sleep, sleepiness and the risk of sleepy driving when getting their driving license

4. Encourage the development of “in board” systems of detection of early phases of somnolence