Wake-up Bus Sleep Study:
A survey of 19 European countries

MAIN FINDINGS

Marta Gonçalves
Coordinating Committee
1. Are there differences in the risk of falling asleep at the wheel between European countries?

2. Are there differences in the risk of accident due to falling asleep at the wheel between European countries?

European survey using the same questionnaire and similar sampling methods
Online survey (15 July – 6 September 2013)

European Sleep Research Society Website
http://www.esrs.eu/sleepstudy.html

Online questionnaire (18 languages)
16-33 questions
Country samples

Participation

Falling asleep at the wheel

Accidents

Frequency

Determinants

Circumstances

Outcome
Country samples

Participation

Falling asleep at the wheel

Accidents

Frequency

Determinants

Frequency

Circumstances

Outcome
Participation by country of residence
<table>
<thead>
<tr>
<th>Country</th>
<th>Participation</th>
</tr>
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<tbody>
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<td>France</td>
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<td>Netherlands</td>
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</table>
Country samples
Participation
Daytime sleepiness
Obstructive sleep apnea risk

Falling asleep at the wheel
Frequency
Determinants

Accidents
Frequency
Circumstances
Outcome
Falling asleep at the wheel
(crude prevalence)
### Falling asleep at the wheel (%)

<table>
<thead>
<tr>
<th>Country</th>
<th>Percentage</th>
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<td>Netherlands</td>
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<td>Austria</td>
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</table>
Falling asleep at the wheel and country of residence

Associations (odds ratios and 95% confidence intervals) between country of residence and having fallen asleep at the wheel in the previous two years (adjusted for age, gender and distance driven in the previous year).
Age and falling asleep at the wheel

Associations (odds ratios and 95% confidence intervals) between age group and having fallen asleep at the wheel in the previous two years (adjusted for country, gender and distance driven in the previous year).
Gender and falling asleep at the wheel

Association (odds ratios and 95% confidence intervals) between gender and having fallen asleep at the wheel in the previous two years (adjusted for country, age group and distance driven in the previous year).
Driving habits and falling asleep at the wheel

Associations (odds ratios and 95% confidence intervals) between distance driven in the previous year (km) and having fallen asleep at the wheel in the previous two years (adjusted for country, age group and gender)
Daytime sleepiness (Epworth Sleepiness Scale) and falling asleep at the wheel

Association (odds ratios and 95% confidence intervals) between daytime sleepiness (Epworth Sleepiness Scale score of 10 or above) and having fallen asleep at the wheel in the previous two years (adjusted for country, age group, gender and distance driven in the previous year).
Obstructive sleep apnea risk (STOPBang) and falling asleep at the wheel (men)

Associations (odds ratios and 95% confidence intervals) between obstructive sleep apnea risk category and having fallen asleep at the wheel in the previous two years in men (adjusted for country, age group and distance driven in the previous year).
Country samples

Falling asleep at the wheel

Participation

Accidents

Frequency

Determinants

Frequency

Circumstances

Outcome
Prevalence (%) of sleep-related accidents

- All countries: 1.4%
- Estonia: 2.7%
- Austria: 2.6%
- Poland: 2.0%
- Portugal: 1.7%
- Romania: 1.3%
- Italy: 1.3%
- Greece: 1.2%
- Serbia: 1.2%
- Germany: 1.2%
- Belgium: 1.0%
- Slovenia: 1.0%
- France: 0.9%
- Lithuania: 0.9%
- Sweden: 0.6%
- Croatia: 0.4%
- Iceland: 0.2%
- Netherlands: 0.0%
- Turkey: 0.0%
INRIX index of traffic intensity by hour of day
(Source: INRIX, 2013)
Accidents – vehicle and type of road

Vehicle driven (%)
- Car: 90.4%
- Truck: 5.4%
- Van: 3.0%
- Bus / Coach: 0.6%
- Motorbike: 0.6%

Type of road (%)
- Major road (motorway, inter-city): 56%
- In Town / City: 26%
- Other (e.g. smaller rural): 18%
Continuous driving period before the accident (%)

ESS ≥ 10 – 69.2% vs 62.5%
Sleepiness (%) at the time of the accident

Perceived sleepiness

- Not sleepy at all: 49.1%
- Somewhat sleepy: 15.0%
- Very sleepy: 35.9%

Not sleepy at all
Somewhat sleepy
Very sleepy
Reasons for falling asleep at the wheel (%)

- Slept poorly the night before: 42.5%
- Usually a bad / poor sleeper: 34.1%
- Unwell: 18.6%
- Had been driving for a very long time: 16.2%
- Working shifts: 15.0%
- Normally asleep at the time of the accident: 12.6%
- On medication: 8.4%
Accidents due to sleepiness - Outcome

Outcome of accident (%)

- 83.2% Minor damage, little or no injuries
- 13.2% At least one person went to hospital
- 3.6% At least one fatality
Conclusion

- High prevalence of falling asleep: over 15% in two-thirds of countries

Of the respondents who fell asleep 7% had a road traffic accident
Main findings

- Main determinants of falling asleep at the wheel:
  - Male gender
  - Driving exposure (distance driven in the previous year)
  - Daytime sleepiness
  - Obstructive sleep apnea risk
Despite differences in the frequency of falling asleep at the wheel, we found common determinants to all participating countries.

Rationale for common policies at the EU level.
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French Society for Sleep Research and Sleep Medicine (SFRMS)
German Society for Sleep Research and Sleep Medicine (DGSM)
Hellenic Sleep Research Association (EEYE)
Icelandic Sleep Research Society (ISRS)
Italian Association of Sleep Medicine (AIMS)
Lithuanian Sleep Society (LSS)
Polish Sleep Research Society (PSRS)
Portuguese Sleep Association (PSA)
Romanian Sleep Society (RSS)
Serbian Sleep Society
Slovenian Sleep Society (SSS)
Spanish Sleep Society (SES)
Swedish Sleep Association (SSA)
Turkish Sleep Medicine Society (TSMS)

The ESRS meets the Members of the European Parliament
Brussels, October 15th 2013