UNIVERSITY OF EASTERN FINLAND

# Single bicycle crashes and alcohol

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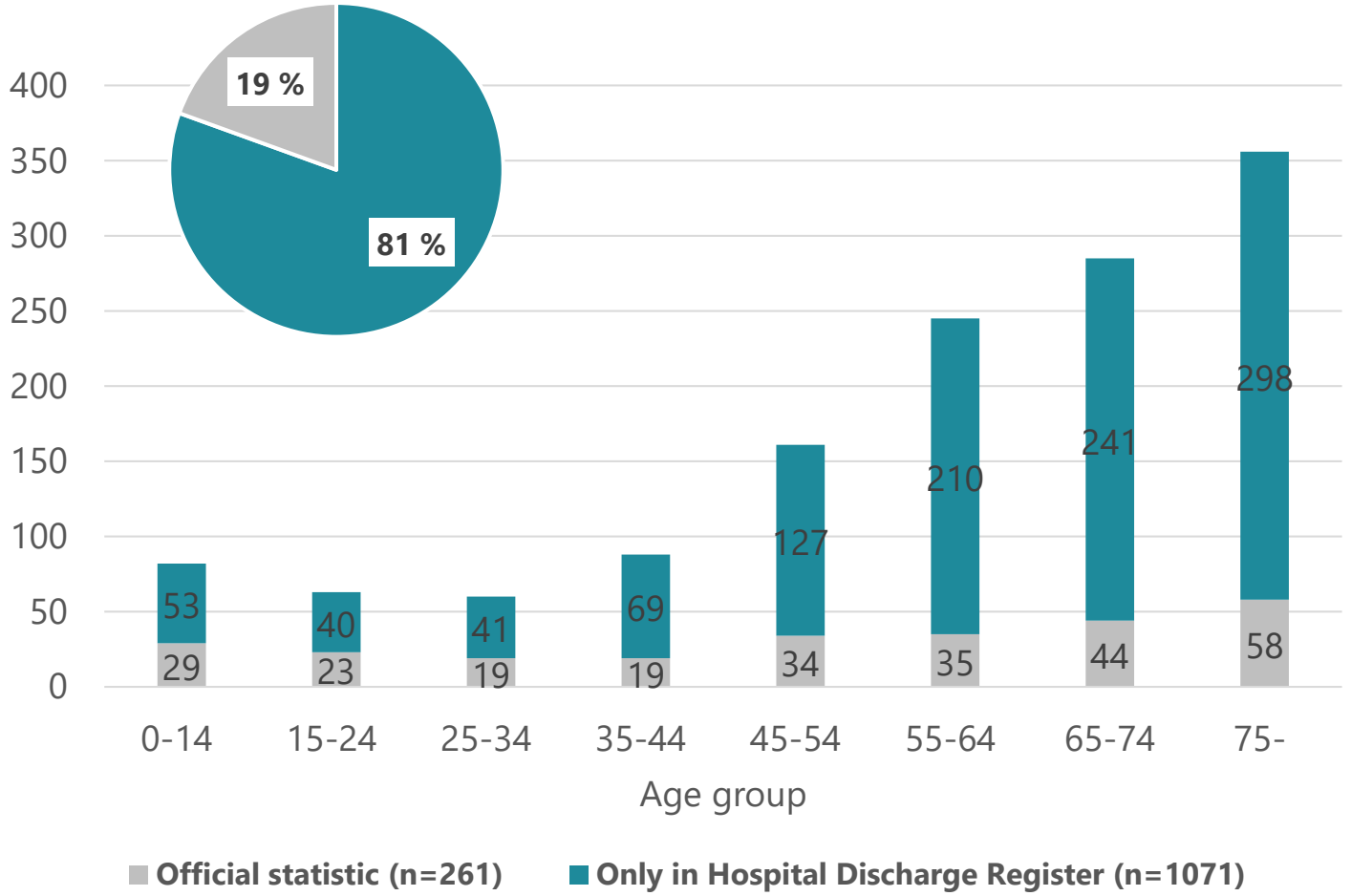
# Single bicycle crashes, “hidden problem”

- In Finland, single bicycle crashes do not end up to the official statistics based on police records.
  - this injury mechanism and the involvement of alcohol are practically ignored
  - actual injury rates cannot be monitored, and potential problems cannot be addressed
  - cyclists are underrepresented in road safety work, which reduces its effectiveness
  - at the same time, cycling is strongly promoted, and its popularity is growing or expected to grow

# Seriously injured (MAIS3+) cyclists in 2014-2018*

- Only official statistics are often used/presented
  - good background information
- Other cases
  - data is difficult to find
  - lack of background information




**Statistics Finland 2020*

# Cycling injuries and alcohol

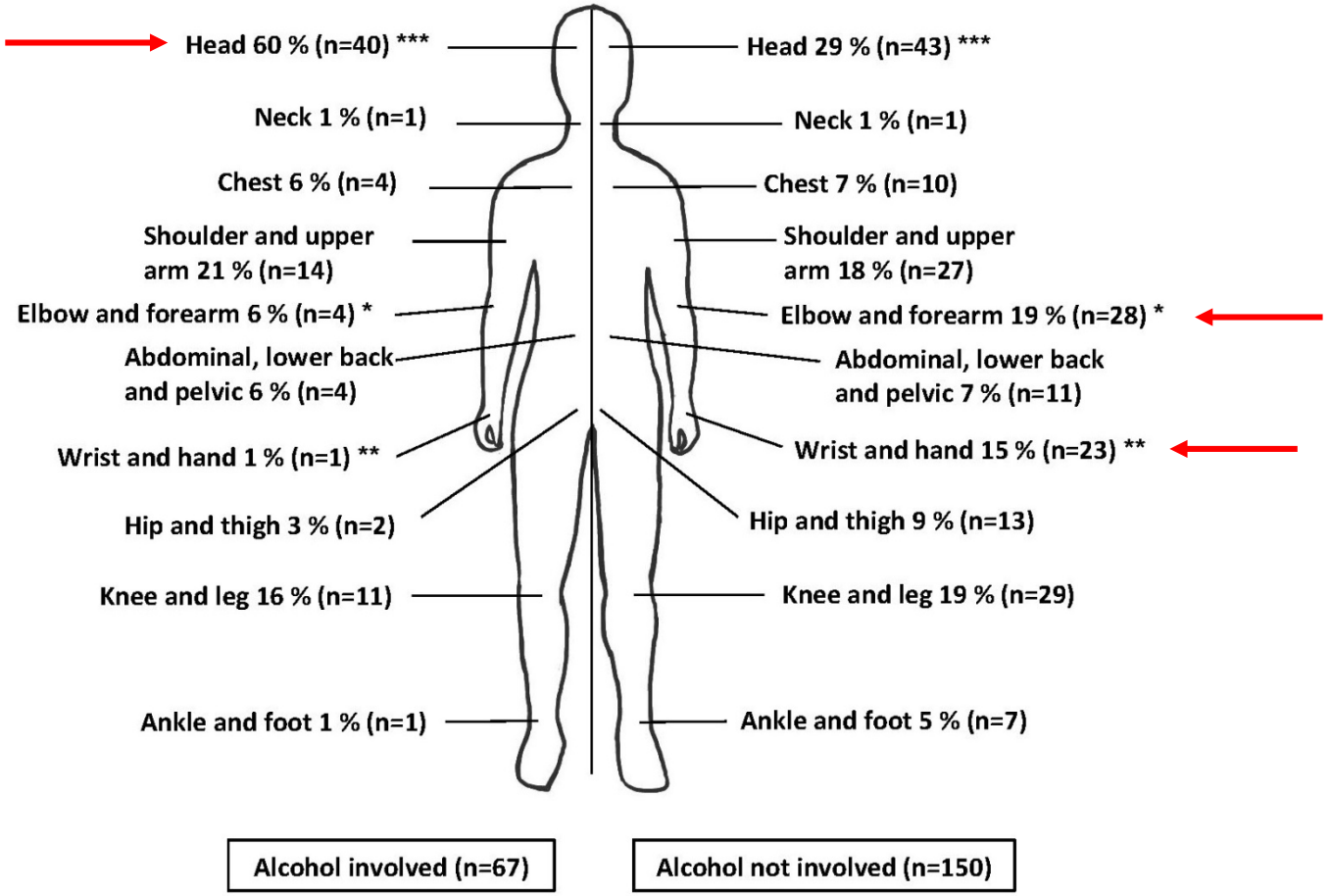
**(Airaksinen et al. 2018)**

Cycling injuries during two-year period (2004-2006), North Kymi hospital (level II trauma centre)

| | Alcohol involved | Sober | Total | *p* |
|---|---|---|---|---|
| N | 67* (31 %) | 150 (69 %) | 217 | |
| Age (mean) | **43.7** | **37.0** | 38.9 | 0.011 |
| Men | **85 %** | **49%** | 60 % | < 0.001 |
| **Single crashes** | **91 %** | **75 %** | **81 %** | **0.012** |
| Helmet use | **0 %** | **20 %** | 13 % | < 0.001 |
| Head injuries | **60 %** | **29 %** | 35% | < 0.001 |
| MAIS 3+ cases | 9 % | 9 % | 9 % | n.s. |
| Inpatients (mean LOS) | 27 % (5.8) | 29 % (9.3) | 28 % (7.8) | n.s. |
| Sick leave (mean, days) | 33 % (48) | 29 % (41) | 31 % | n.s. |
| Official statistics | **3 (4 %)** | **16 (11 %)** | 19 (9%) | |

* of which 87% ≥ 1.2 g/L (‰)

# Cyclists injuries by body region (AI / sober)

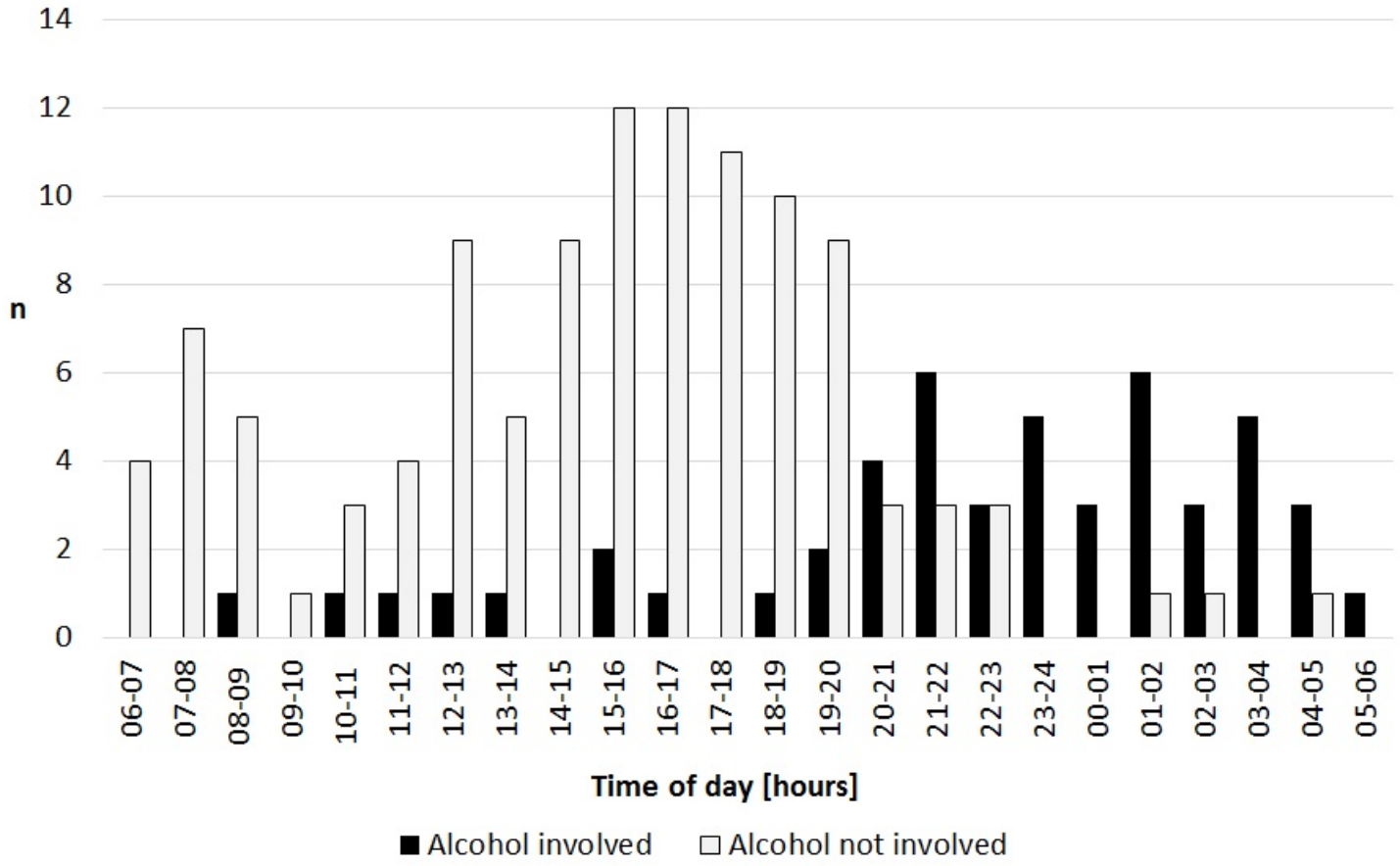



Airaksinen et al. 2018

* $p$=0.026, ** $p$=0.006, *** $p$ < 0.001.

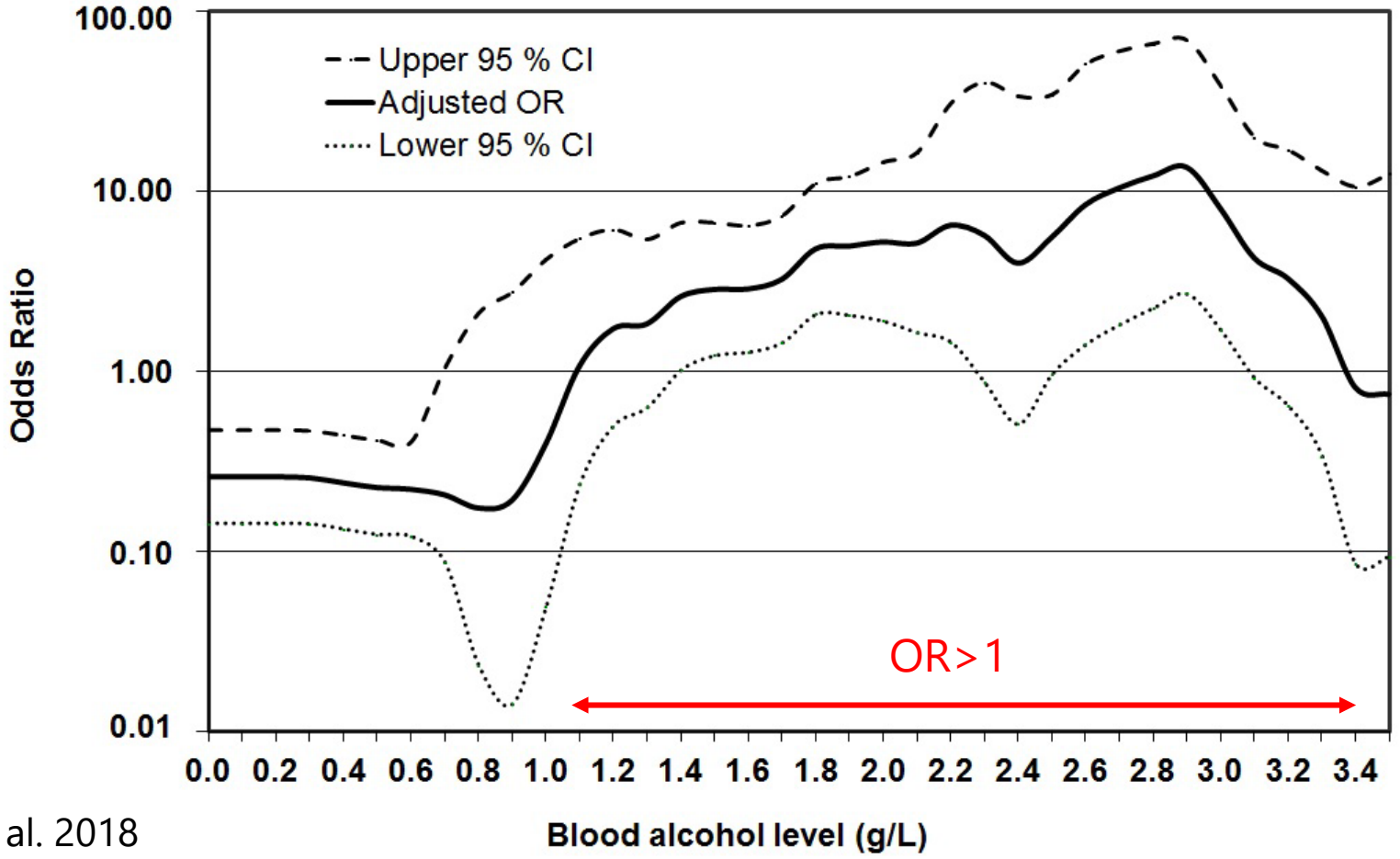
# Number of crashes according to the time of day

Cyclists with AI were more likely to have a crash in the evening or night between 8 pm to 6 am and on weekend than those who were sober ($p<0.001$)




Airaksinen et al. 2018

# Risk of head injury with 95% confidence intervals by blood alcohol level




Airaksinen et al. 2018

# What else do we know?

- Finnish Crash Data Institute: Fatal bicycle crashes 2014-2018 (n=115):
  - 41 % (47/115) were single bicycle crashes (annual range 9–16)
  - 16 % (18/115) of cyclists were under the influence of alcohol (>0.5 ‰) at the time of the accident
- Airaksinen et al. 2020: Severe (NISS>15) traffic injuries 2009-2018 in Helsinki Trauma Registry (HTR) (n=1 063)
  - 183 severe bicycle crashes of which 35 % (n=64) were single crashes
  - Head injuries: 73.4 % (single-crashes) 63.9 % (others), ns.
  - The information of alcohol is not systematically recorded in the HTR

# What else do we know?

- Utriainen 2018: Insurance data of 3 448 commuters' single bicycle crashes 2016-2017
  - Main characteristics:
    - Infrastructure (62.9 %) -> skidding due to a slippery road surface (47%)
    - Cyclist-related (n=15.8 %)
    - Interaction with other road user (15.5 %)
  - Most common injured body parts were upper (29 %) and lower (29 %) limbs
  - 66 % resulted in incapacity for work of 0–3 days and 9 % more than 30 days
- Finnish Road Safety Council: queries from 2017 (n=1 035) and 2020 (n=1 003)
  - 28 % had been cycling drunk in the last five years and 45 % considered drunk cycling to be acceptable (2017)
  - 22 % were thinking  that drunk cycling is not prohibited (2020)
  - 16 % agreed with the statement that cycling is quite a safe way to travel if you are drunk (2020)

# Alcohol impact on human performance

- High proportions of single bicycle crashes with alcohol involvement have been presented previously (Orsi et al. 2014, Sethi et al. 2016).
- Alcohol impairs psychomotor skills which are required more in cycling than in driving a car (Schewe et al. 1978).
- Alcohol reduces cyclist's ability to maintain balance, negotiate traffic, and perceive and react to hazard situations. (Li 2001 et al., Lecoultre & Schutz 2009)
- Inhibition of protective reflexes ->inability to put the outstretched hand to break the fall ->lower incidence of limb injury and greater incidence of head injury (Johnston & MacGovern 2004)
- Maybe drunken cyclist has greater risk of single crash than of collision with another party – and greater risk of single-crash than sober cyclist?

# Conclusions and discussion

- Development of road accident statistics is one of the most important and urgent measurement
  - The actual number of injured cyclists must be able to be monitored!
- In Finland, drunk cycling is prohibited, but the law does not appear to be effective
  - Should we have blood alcohol limit (g/L) for cyclists and consider changes for fining system?
- Attention to the cyclist's condition, behavior and responsibility as a vehicle driver
  - Alcohol, speed, safety equipment, knowledge and compliance with the traffic rules etc.
- Promotion of cycling vs. Vision Zero
  - Are we prepared to accept a possible increasing number of serious bicycle injuries?
  - Promoting safe cycling
- Finland is currently preparing a national traffic safety strategy 

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# Thank you!

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