

# E-SCOOTER INJURIES IN HELSINKI, FINLAND

ETSC Online PIN talk - Improving the road safety of e-scooters

HENRI VASARA

# BACKGROUND



- **Responsible researcher,** Helsinki University follow-up study on e-scooter injuries
- **Orthopaedic surgery resident,** Central Finland Hospital Nova & Helsinki University
- **PhD,** Helsinki University
- No disclosures



# HELSINKI UNIVERSITY HOSPITAL E-SCOOTER INJURY DATA

- **Collected since 2021 to 2025**
- Does not include pediatric (<16 years) injuries
- **Based on word search** from a datapool consisting all hospital patient records
- Each case is manually analyzed and confirmed to be an e-scooter injury

## Characteristics and costs of electric scooter injuries in Helsinki: a retrospective cohort study

Henri Vasara , Linda Toppari, Veli-Pekka Harjola, Kaisa Virtanen, Maaret Castrén & Arja Kobylín

*Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine* 30, Article number: 57 (2022)

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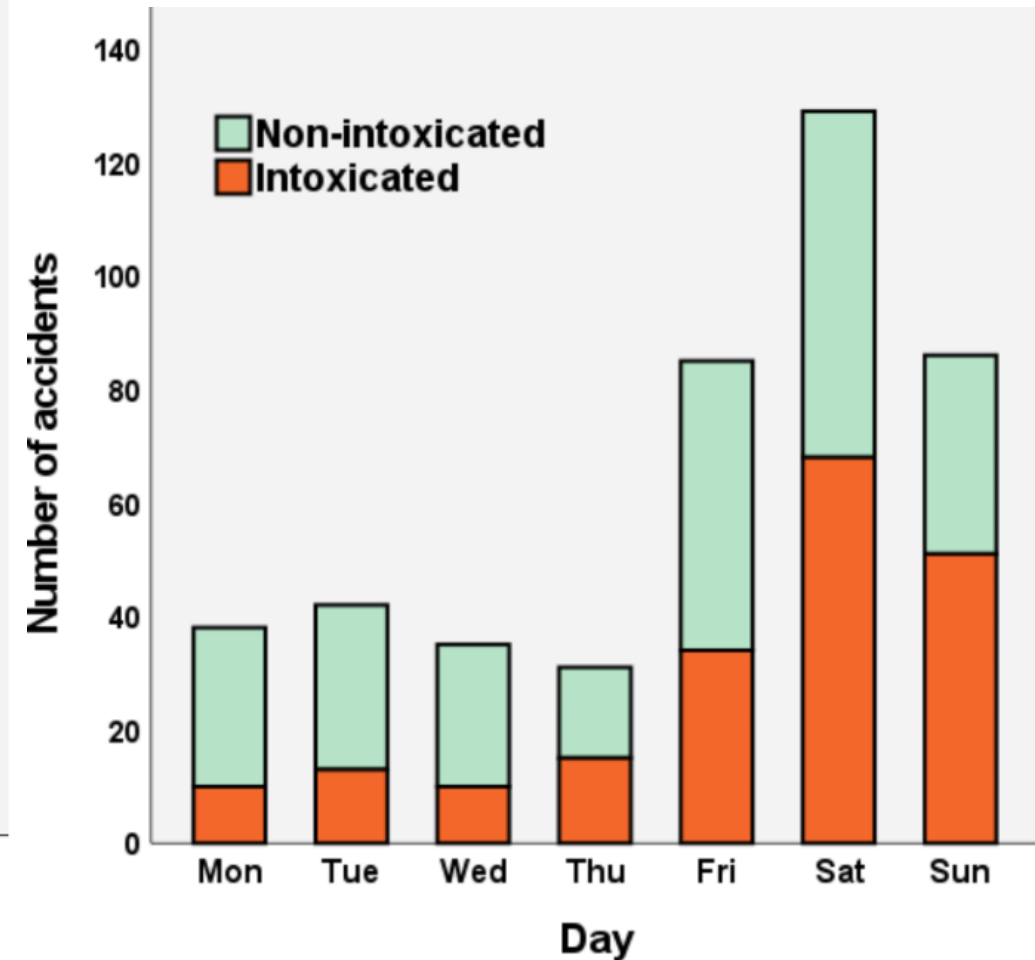
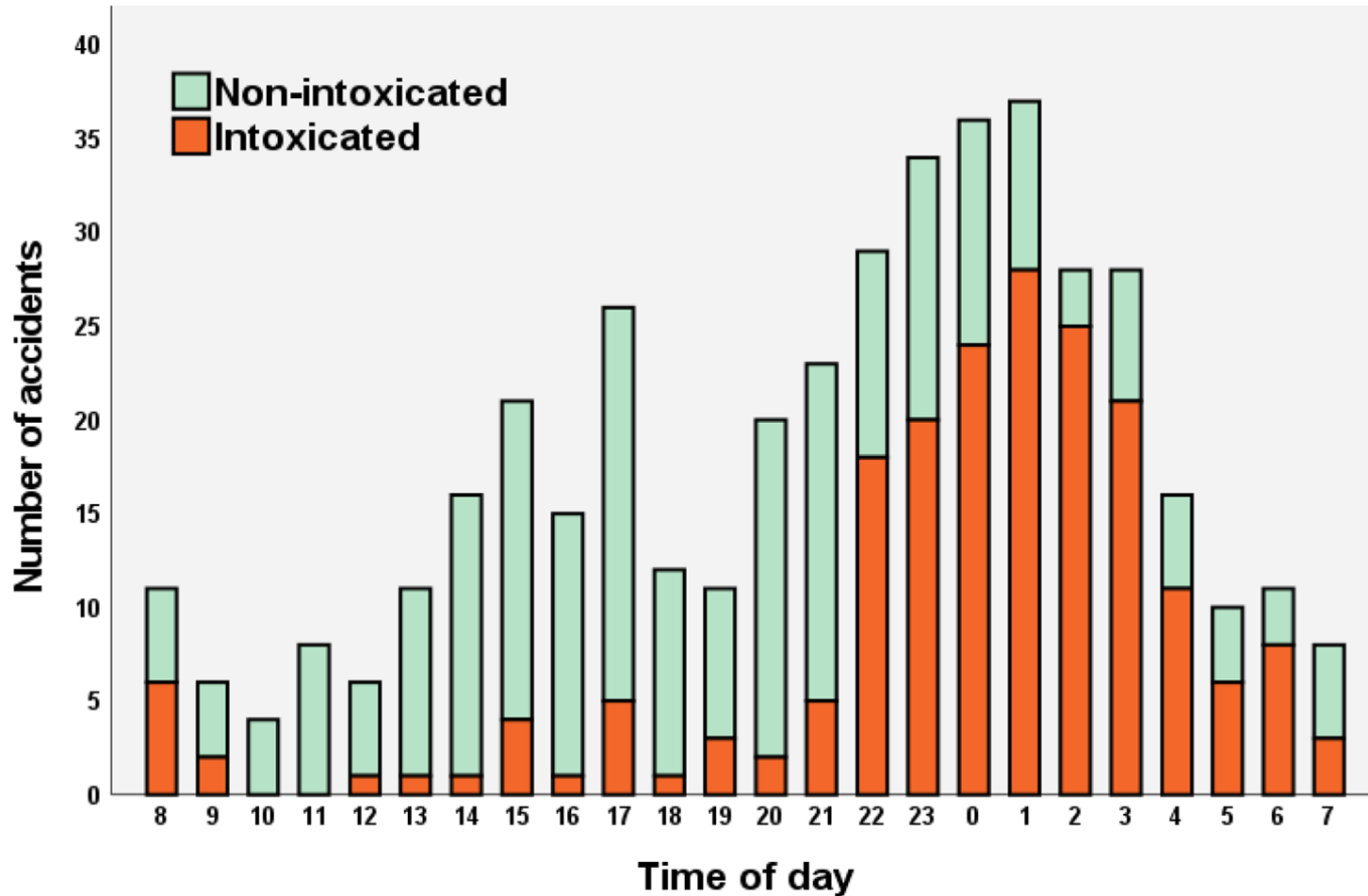
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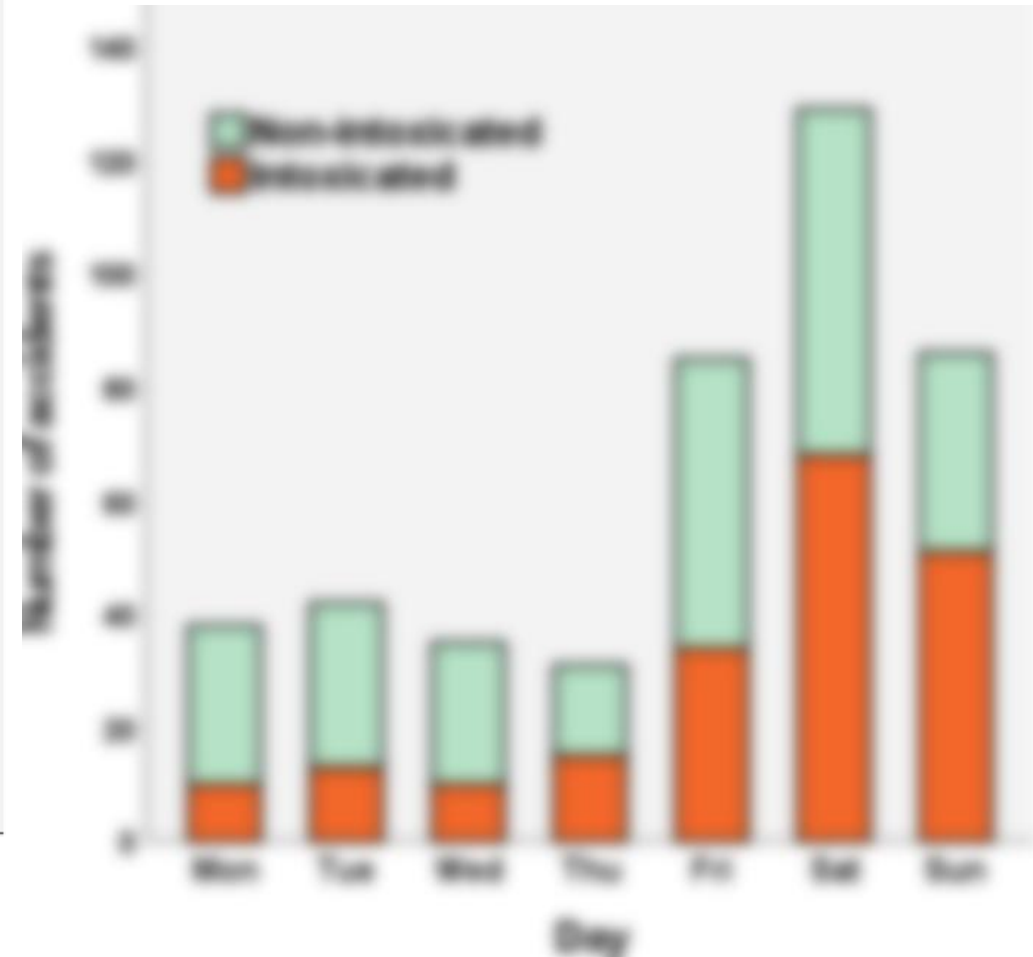
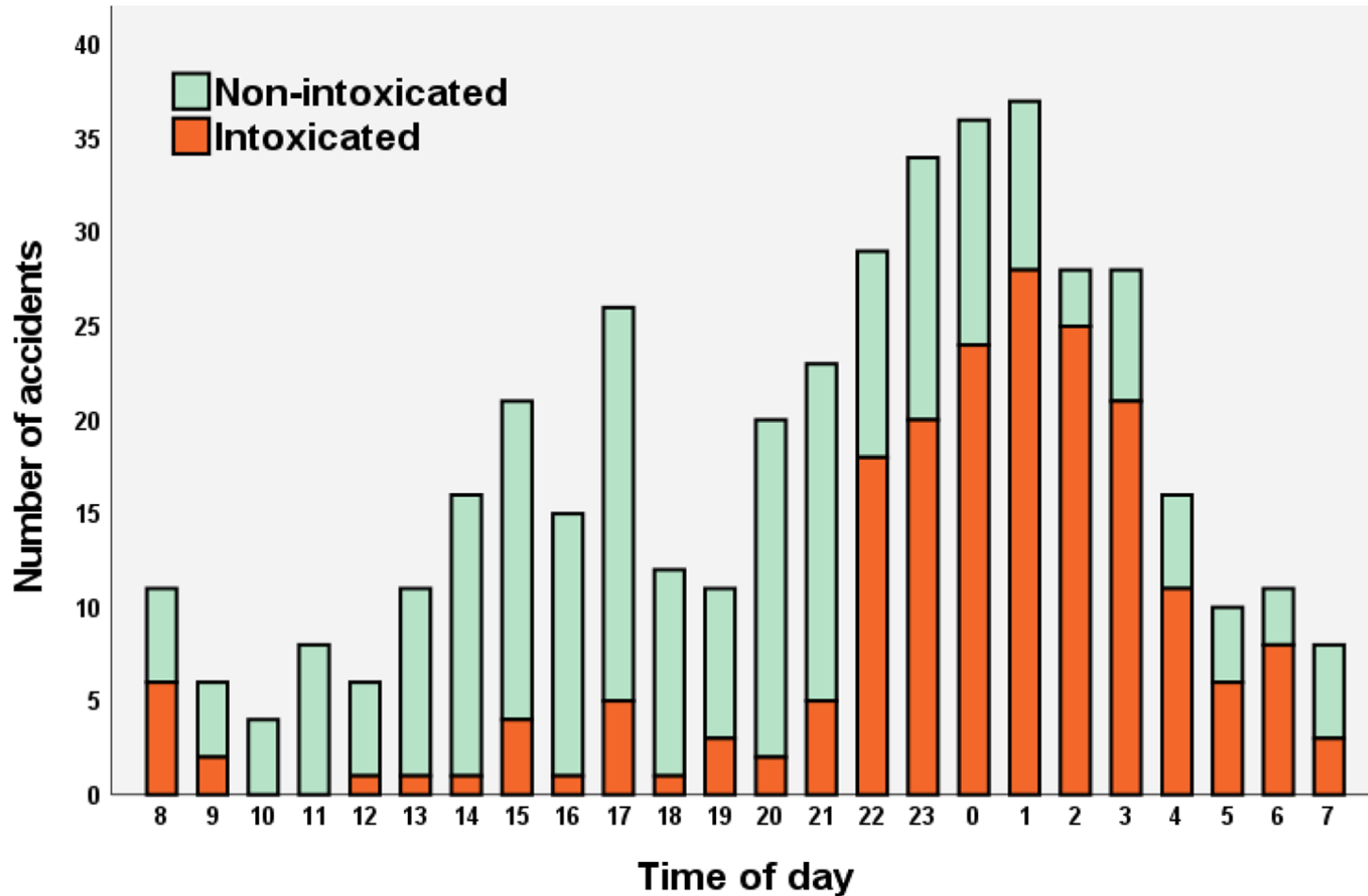
**Speed and Nighttime Usage Restrictions and the Incidence of Shared Electric Scooter Injuries**

Oskari Pakarinen, MD, PhD<sup>1</sup>; Arja Kobylín, MD<sup>1</sup>; Veli-Pekka Harjola, MD, PhD<sup>1</sup>; et al

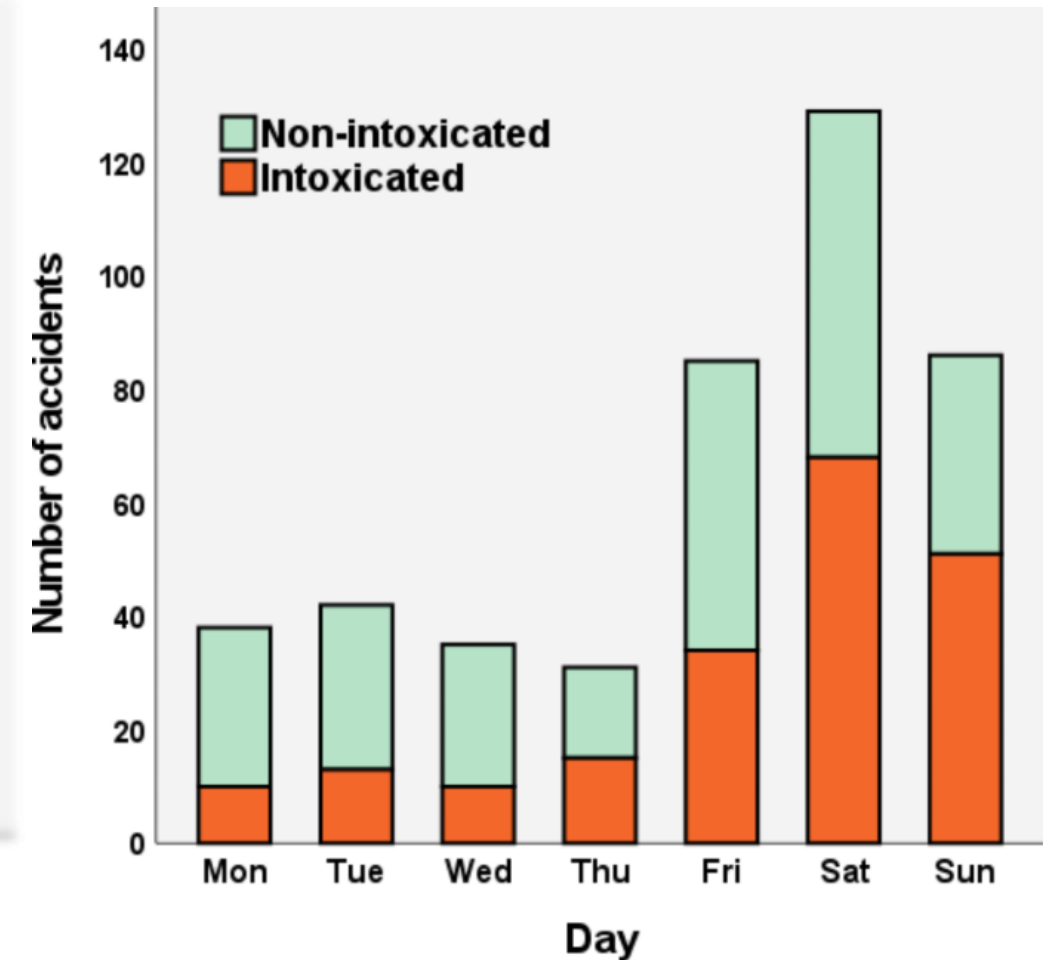
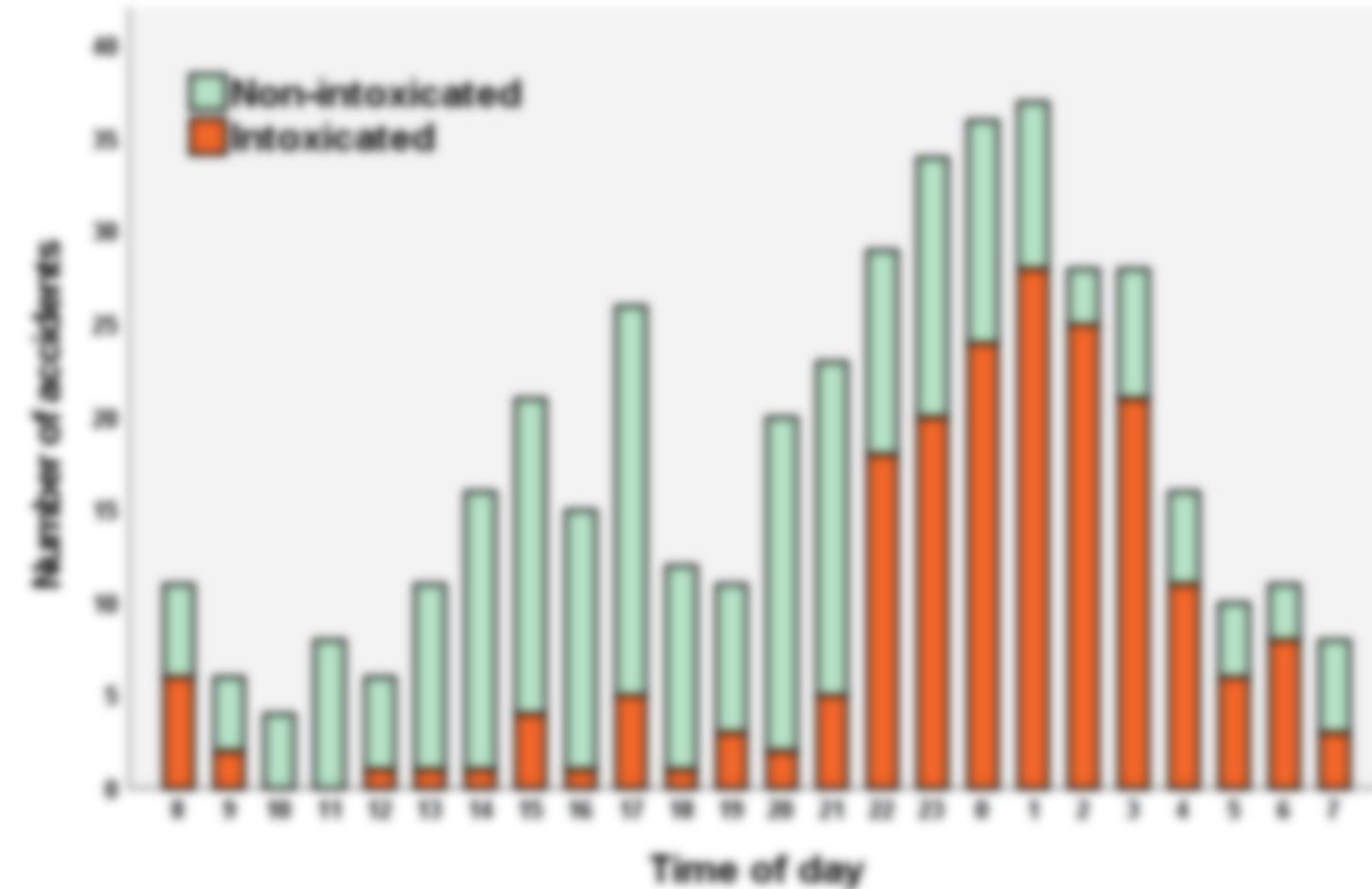
# THE E-SCOOTER ACCIDENT SITUATION IN 2021



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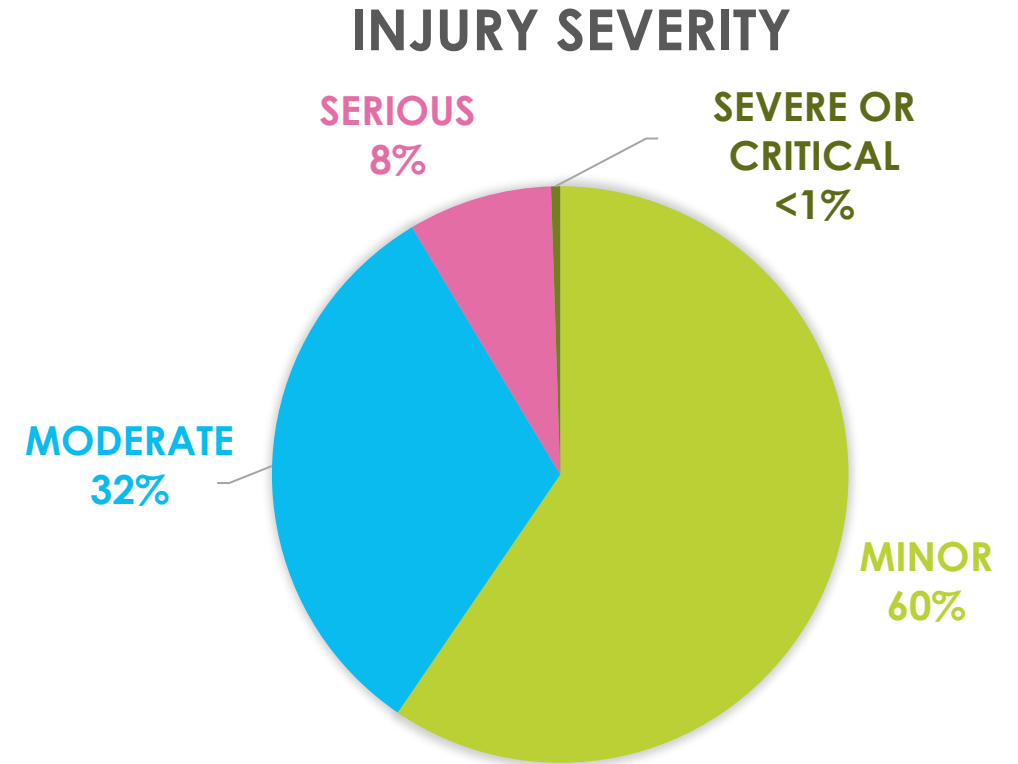


# THE E-SCOOTER ACCIDENT SITUATION IN 2021



# INJURY SEVERITY (BY FAR)\*

- 60% minor
- 32% moderate
- 8% serious
- <1% severe or critical
- 3 cases of death



**\*Based on Abbreviated Injury Scale**



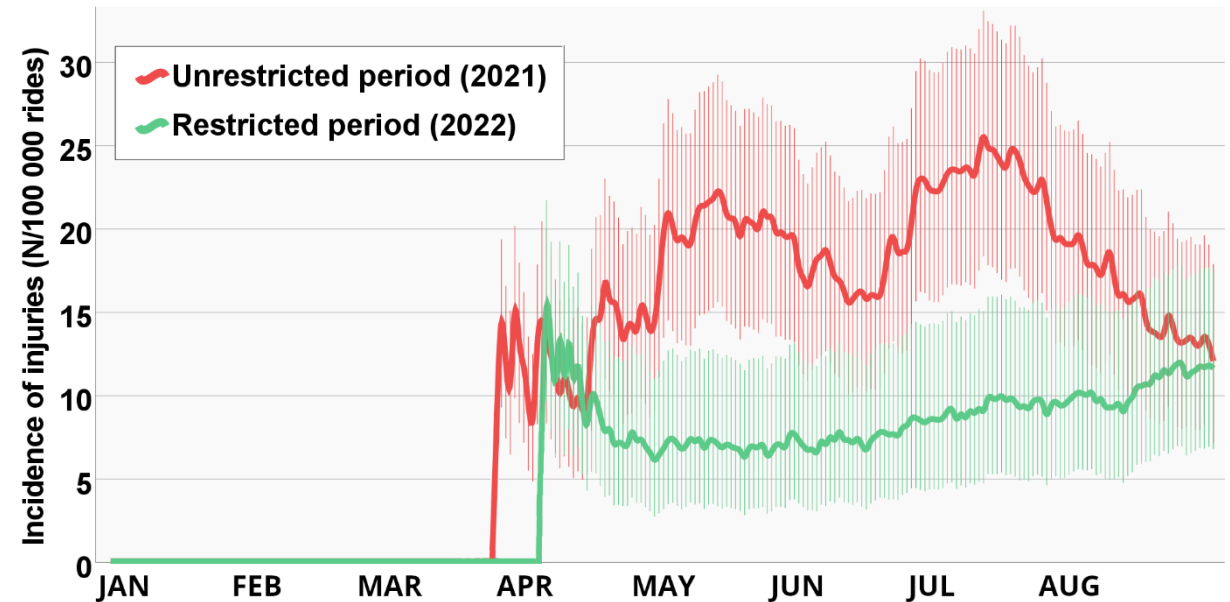
# RESTRICTIONS IMPLEMENTED ON SHARED E-SCOOTERS ON SEPTEMBER 2021

- **Top speed limit to 20km/h (vs. 25km/h)**
- **Usage prohibited on Friday and Saturday nights (12 a.m. to 5 a.m.)**
- **Top speed limit at night to 15km/h from Sundays to thursdays (12 a.m. to 5 a.m.)**



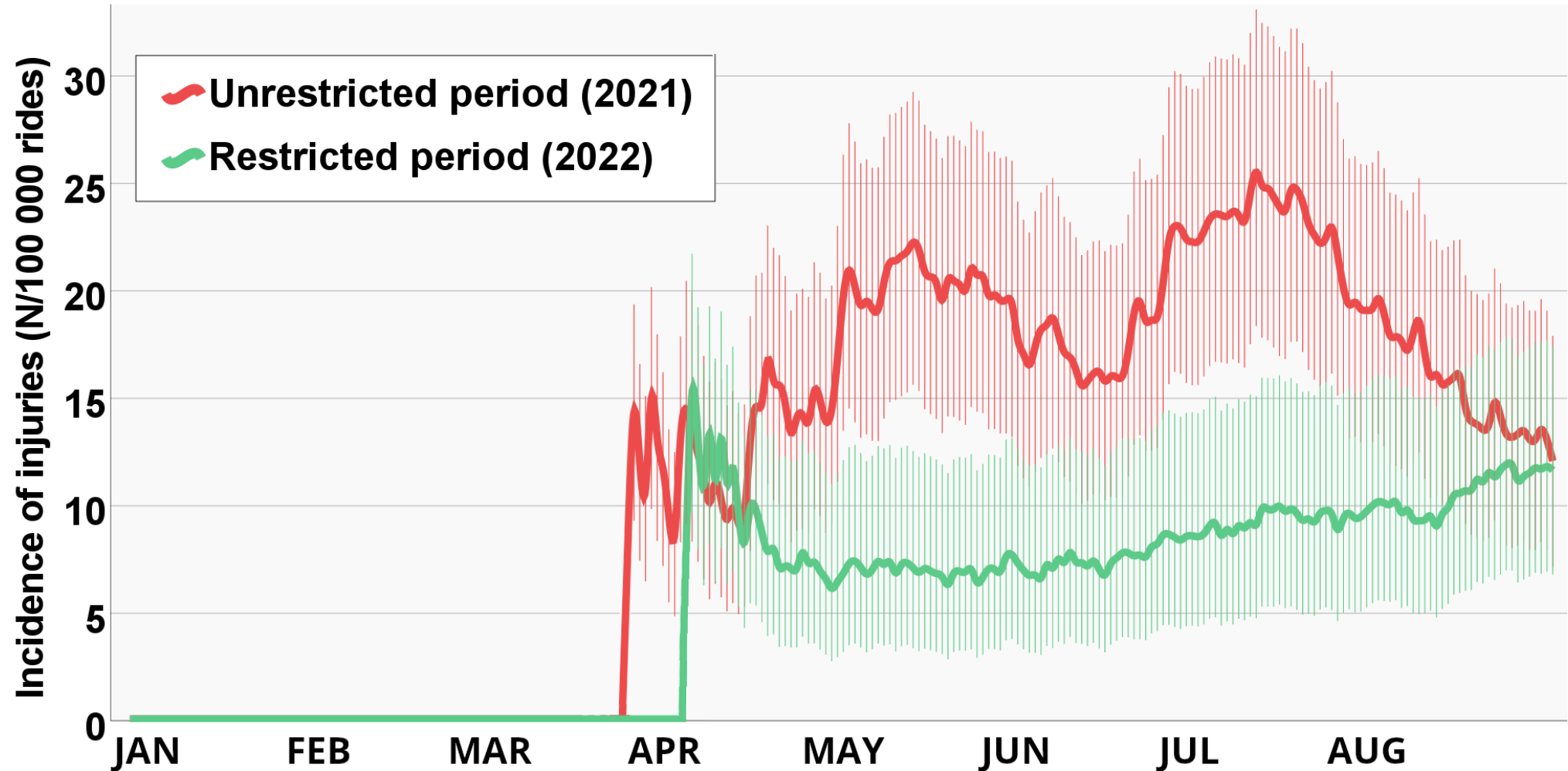
# THE SITUATION AFTER THE RESTRICTIONS

- **Relative number of injuries was reduced by half\***
- 19 vs. 9 injuries per 100 000 e-scooter trips

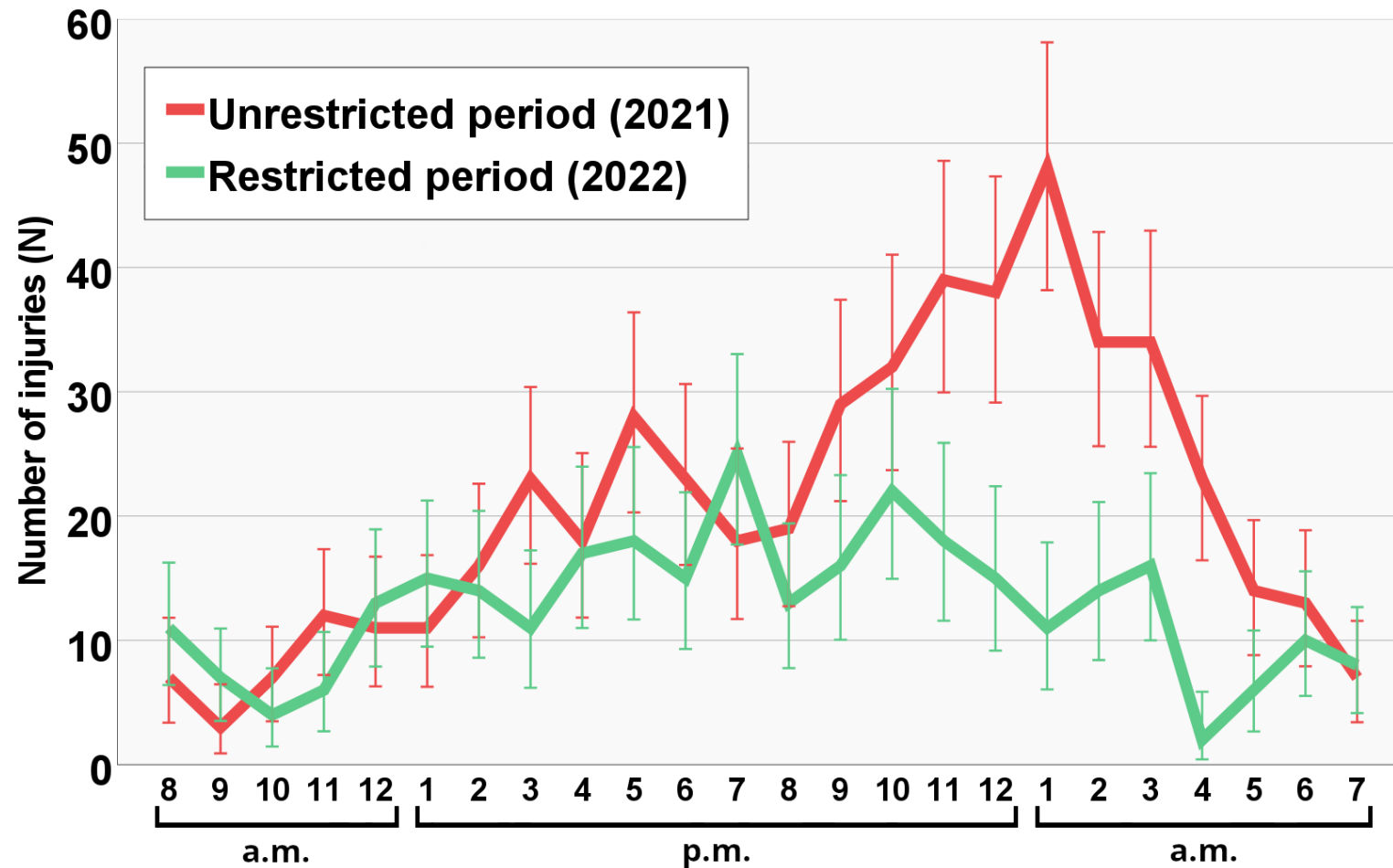


\*Confirmed private e-scooter injuries excluded

# THE SITUATION AFTER THE RESTRICTIONS



# THE SITUATION AFTER THE RESTRICTIONS



# IMPACT OF 20KM/H LIMIT (VS. 25KM/H)\*

**25km/h (2021): 13 injuries per 100 000**

**20km/h (2022): 8 injuries per 100 000**

\*nighttime (12 a.m. to 5 a.m.) injuries and trips excluded

# AFTER THE RESTRICTIONS

- The average severity of injuries remained similar
- Proportion of intoxicated riders decreased
  - 38% vs. 31%

# MEANWHILE IN THE CITY OF TAMPERE

## TAMPERE

- 3rd largest city in Finland (Largest outside the Helsinki metropolitan area)
- Population: 260 000 residents
- **The city of Tampere had implemented only a nighttime top speed restriction of 15km/h**



# AT THE SAME TIME IN TAMPERE

- The city of Tampere had only a nighttime top speed restriction of 15km/h → No difference

Table 2. Summertime Incidence of Electric Scooter-Related Injuries<sup>a</sup>

Variable	2019	2020	2021	2022 <sup>b</sup>
Total No. of injuries	76	111	222	245
Total No. of rides	448 734	444 402	1 250 719	1 413 074
Total distance driven, km	1 350 427	1 219 129	2 366 355	2 349 897
Mean distance per ride, km	3.01	2.75	1.89	1.66
Injury incidence (95% CI)				
Per 100 000 rides	16.94 (13.34-21.20)	25 (20.56-30.10)	17.75 (15.75-20.58)	17.34 (15.23-19.65)
Per 100 000 km driven	5.63 (4.43-7.04)	9.10 (7.49-10.96)	19 (17-20)	18.4 (16.1-21.1)

<sup>a</sup> The summertime period was June 1 to August 31 during each of the study years.

<sup>b</sup> Nighttime (12 AM to 6 AM) speed restriction was set to 15 km/h in the summer of 2022.

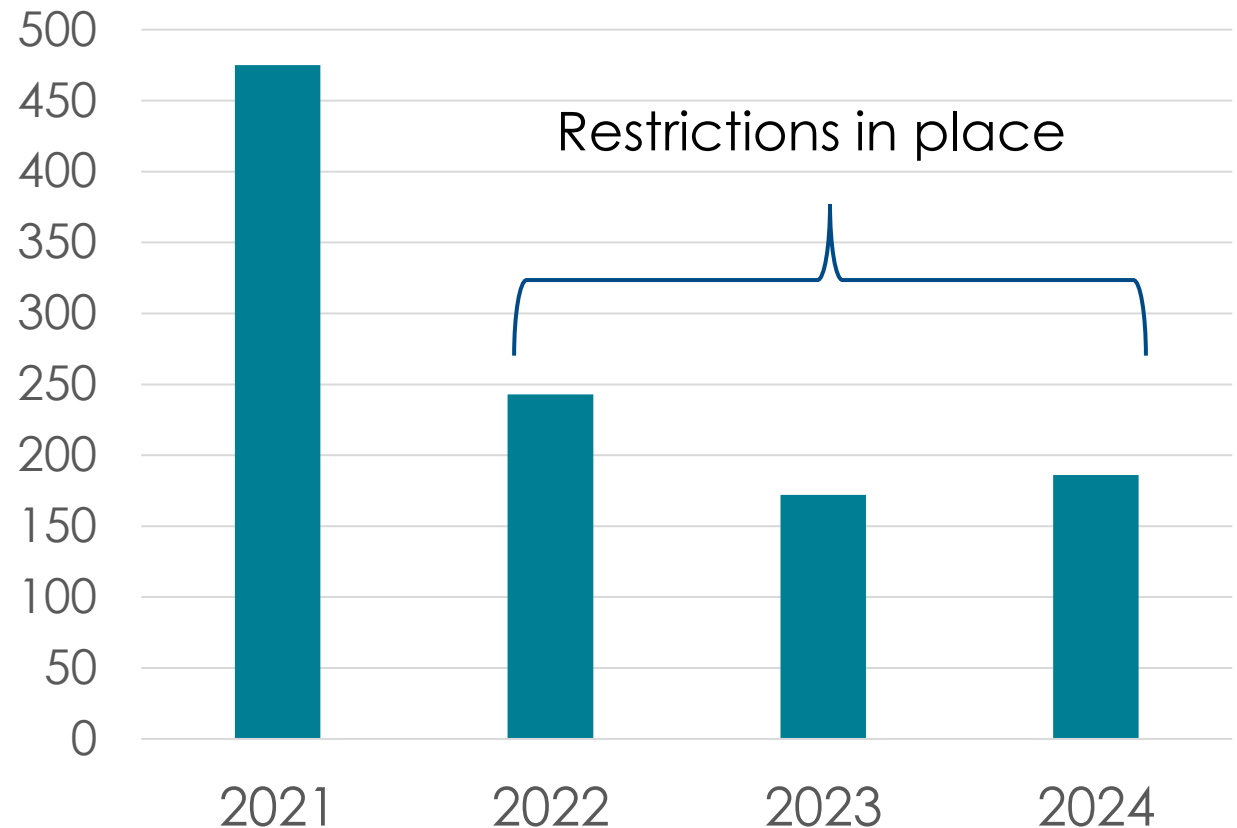
Liukkonen R, Aarnikko H, Stenman P, Ovaska S, Reito A. Association of Nighttime Speed Limits and Electric Scooter-Related Injuries. *JAMA Netw Open*. 2023;6(6):e2320868. doi:10.1001/jamanetworkopen.2023.20868



# DEVELOPMENT OF THE NUMBER OF INJURIES IN HELSINKI

Electric scooter accidents requiring emergency room visits in Helsinki between January and July

2021: 475 accidents  
2022: 243 accidents  
2023: 172 accidents  
2024: 186 accidents



# OUR OBSERVATIONS

The number of injuries does not decrease significantly without restrictive measures

## OUR ESTIMATION

Between 2022 and 2024, the restrictions prevented an estimated 810 accidents

## WHAT'S NEXT?

- Insurances are required for all shared e-scooters and majority of private e-scooters since the summer of 2024
  - What is the effect on injuries?
  - More data?



## WHAT'S NEXT?

- New micromobility legislation to take place on July 2025 (?)
  - Allows cities to apply restrictions on shared e-scooters
  - Alcohol intoxication penalization limit 0,5‰
  - Changes in traffic regulations

## KEY MESSAGES



**LESS (SPEED) IS MORE (HEALTH AND MONEY)**



**NIGHTTIME RESTRICTIONS ARE LIKELY TO BE EFFECTIVE**



**THE NUMBER OF INJURIES DOES NOT DECREASE SIGNIFICANTLY WITHOUT RESTRICTIVE MEASURES**

# PUBLICATIONS

- Vasara H, Toppari L, Harjola VP. *et al.* Characteristics and costs of electric scooter injuries in Helsinki: a retrospective cohort study. *Scand J Trauma Resusc Emerg Med* 30, 57 (2022).  
<https://doi.org/10.1186/s13049-022-01042-0>
- Pakarinen O, Kobylín A, Harjola V, Castrén M, Vasara H. Speed and Nighttime Usage Restrictions and the Incidence of Shared Electric Scooter Injuries. *JAMA Netw Open.* 2023;6(11):e2341194. <https://doi.org/10.1001/jamanetworkopen.2023.41194>
- Snäll, J., Vasara, H., Murros, OJ. *et al.* Changes in e-scooter related maxillofacial injuries following legislative measures in Helsinki, Finland. *Sci Rep* 15, 9720 (2025).  
<https://doi.org/10.1038/s41598-025-94602-0>



# THANK YOU

"Put a picture of a dog at the end of your presentation – the audience will remember it better! "

*-Anonymous professor*

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