

Emergency Department treatments due to bicycle accidents in the Netherlands: effects of increasing e-bike popularity

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Introduction

- 71,400 Emergency Department visits (2020)
- 44 ED visits per 10 million kilometers (2020)
- 28% Increase in ED visits (2011-2020)



- Increasing sales and usage of e-bikes
- Possible effects on bicycle accidents must be studied to facilitate policymaking



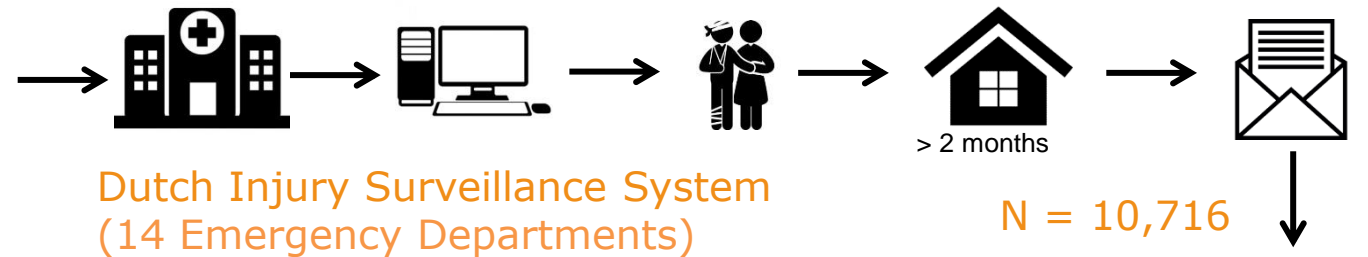
- Need to collect more detailed information on for example type of bicycle, risks, and causes of accidents
- Research on behalf of the Ministry of Infrastructure & Water Management



Methods



Objective: providing policymakers with recent insights into bicycle accidents and options for prevention



N = 4,208 (respons 39%)

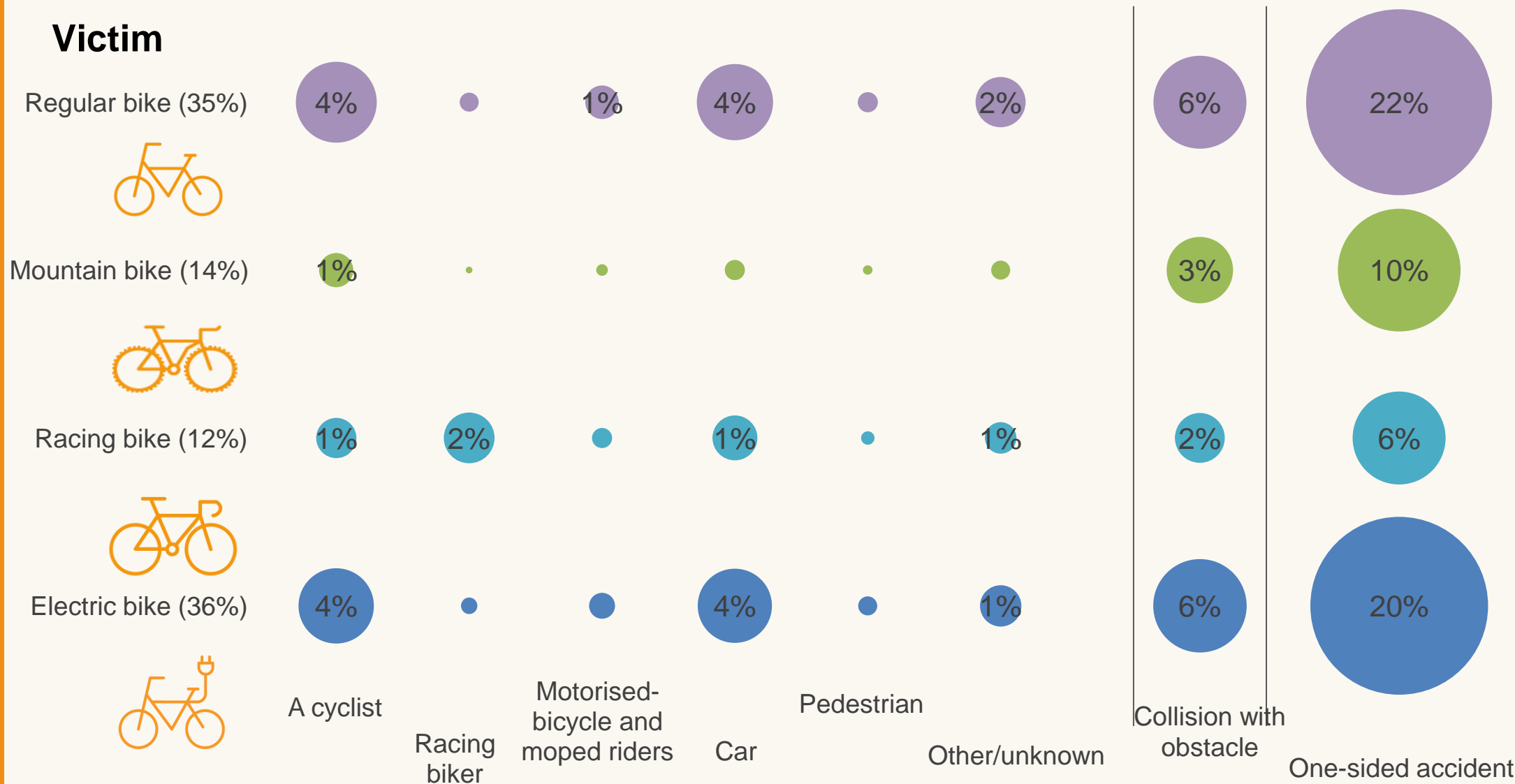


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Reference group of non-victims: n = 4,870

Accident type

Victim

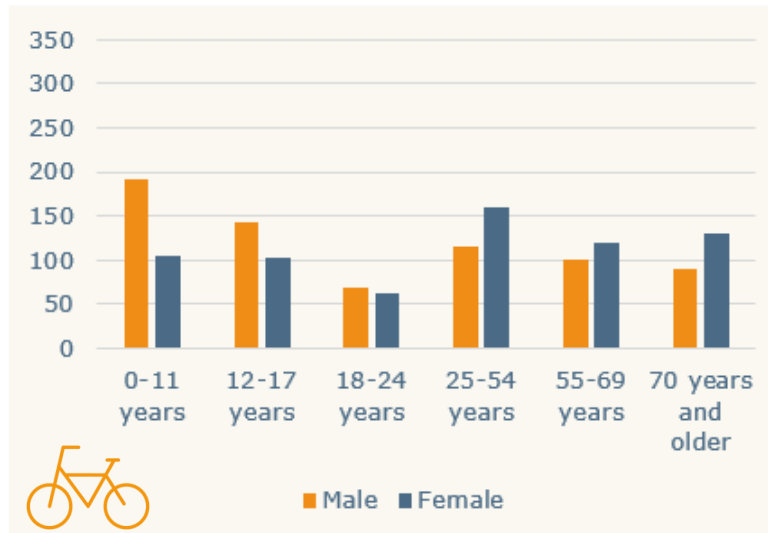


Age & gender:

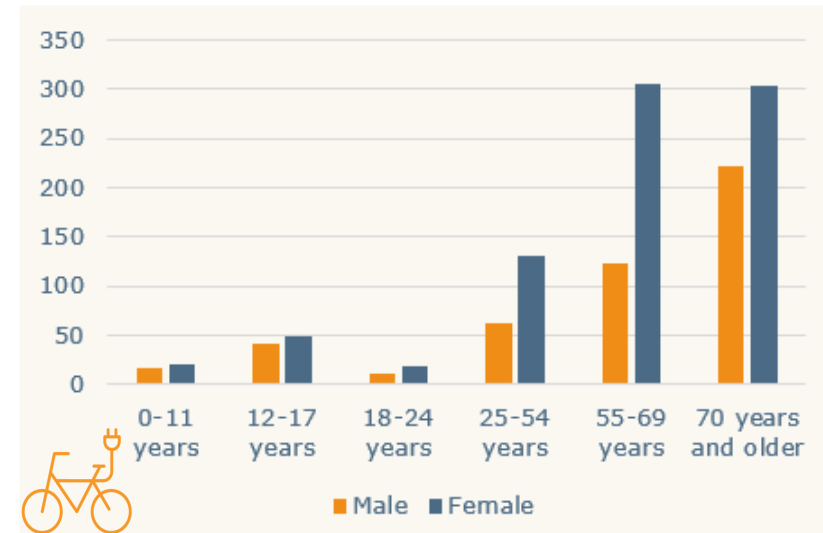


ED visits

Regular bike

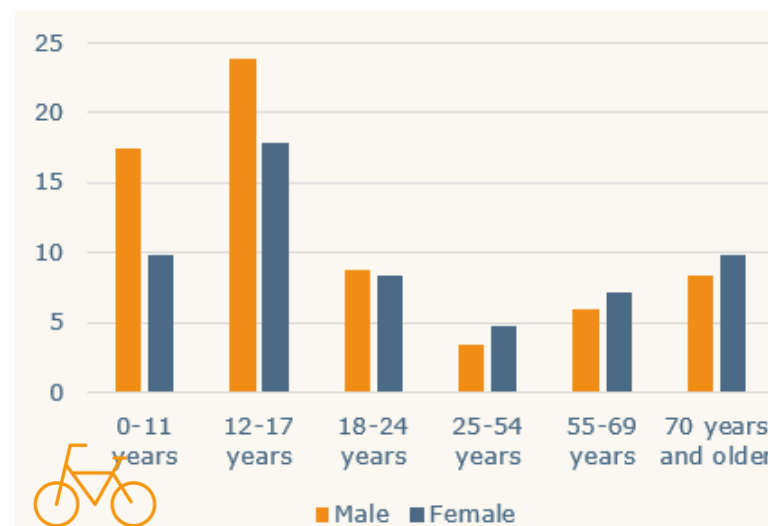


Electric bike

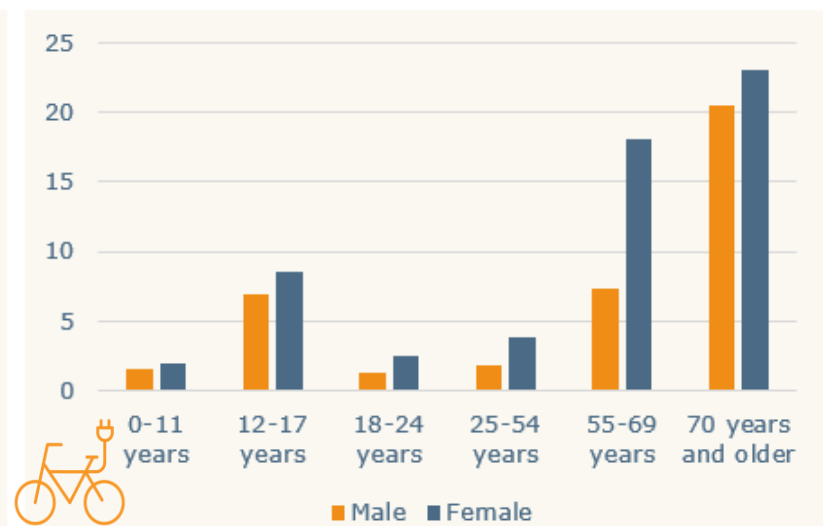


ED visits per 100.000 inhabitants

Regular bike



Electric bike





2020 vs. 2016

- 2020: 36% of victims on an electric bike
- 2016: 19% of victims on an electric bike
- Increase in injuries after an accident with an electric bike, related to a sharp increase in the number of electric bikes sold and an increase in e-bike kilometers
- Victims were more often 55 years of age and older, explained by the larger number of relatively old electric bike cyclists
- Kids aged 12-17 years: 22% of ED visits caused by an accident on an electric bike (compared to 4% in 2016)

Risks



VS.



- Compared to reference group:

	% Reference group	% Victims	OR*	95% CI
Regular bike	68	50	1.00	Reference
Electric bike	32	50	1,64	1,42-1,89

*After controlling for age, gender, kilometers , physical complaints, Body Mass Index and medication use

- No explanation yet for the higher risk of injury requiring treatment in the Emergency Department for people riding electric bikes: more research is needed
- When corrected for age and kilometers: no higher risk for serious injury (MAIS2+) while riding an electric bike



Types of accidents

- 54% one-sided accident



- 24% collision with another road user



- 15% collision with an obstacle





Causes of accidents

- 34% road condition
- 26% own behaviour
- 26% someone else's behaviour
- 18% weather conditions
- 18% traffic situation

Causes of accidents with electric bikes do not differ much from types and causes of accidents with regular bikes!

Conclusions



- Increase in injuries after an accident with an electric bike, related to a sharp increase in the number of electric bikes sold and an increase in e-bike kilometers
- Compared to regular bikes more than 1.5 times higher risk for people riding electric bikes, we can not yet explain why exactly
- More severe injuries (MAIS2+), but not significant when corrected for age and kilometers
- No differences found in types and causes of accidents between regular bikes and electric bikes: prevention for both groups should not have to be different and must focus on elderly and kids 12-17 years old