

The impact of electric scooters' legalisation

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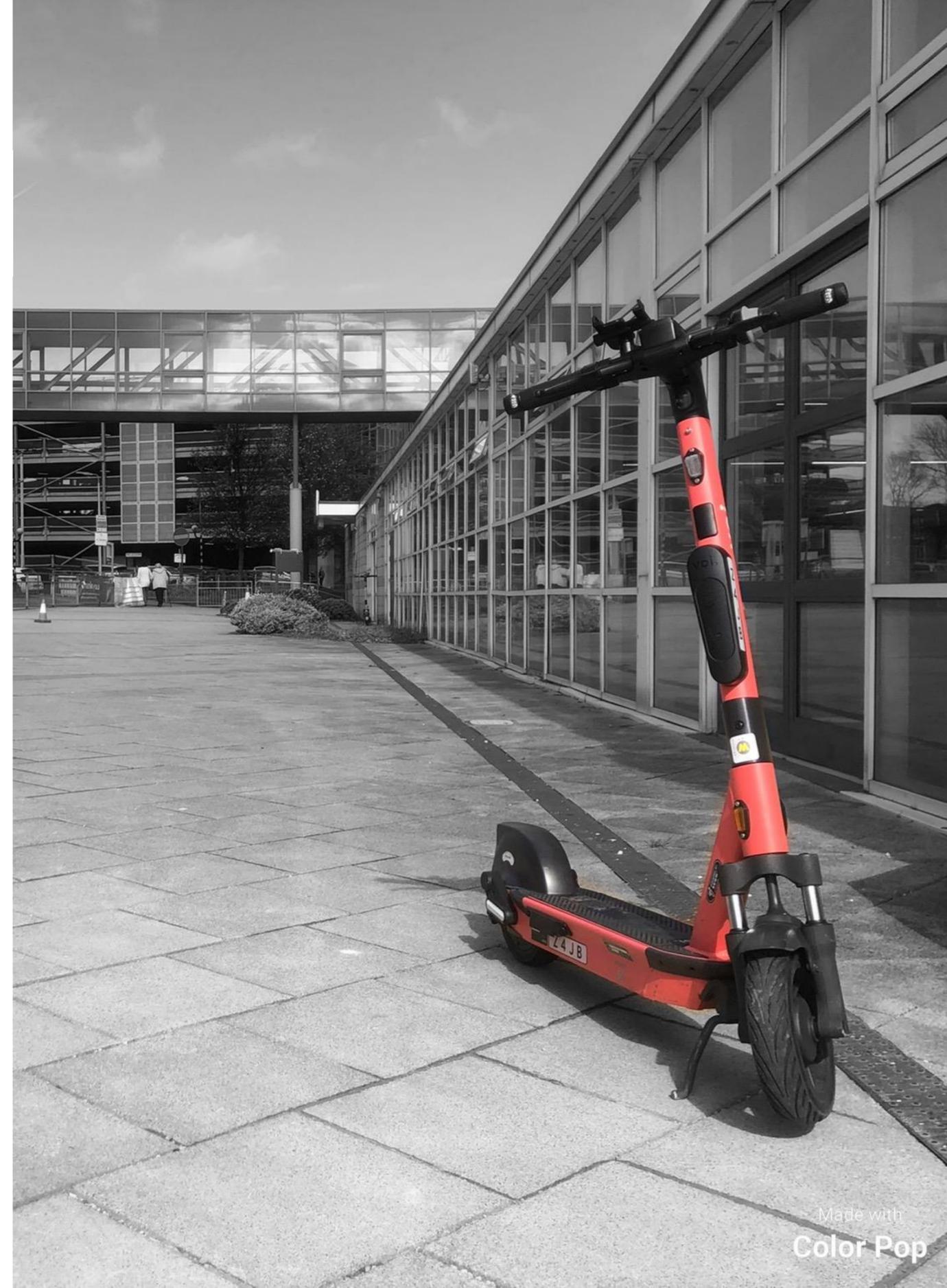
Background

- Introduced 6 October 2020 to Liverpool
- One year pilot (12 sites in the UK)
- 1,250 e-scooters in central Liverpool
- App Store / Google Play: £1 to unlock, then £0.20 a minute

Methods

- Retrospective cohort of injury mechanism involving electric scooter
- Inclusion: All patients presenting to LUFT centres with limb injuries
 - Uniquely amongst the 12 trial sites, LUFT covers entirety of trial site, for ambulance and ambulatory patients, capturing **all injuries**
- Exclusion: Patients under 16 (taken to Alder Hey)
- Metrics: Demographics, injuries, treatment
- Rental scooter data freely supplied by Voi, Sweden





Made with
Color Pop

Results

Demographics

- 6 October 2020 to 5th May 2021 (present)
- 51 patients, 26F : 25 M
- Median age 26.5 years (SD 15.4)

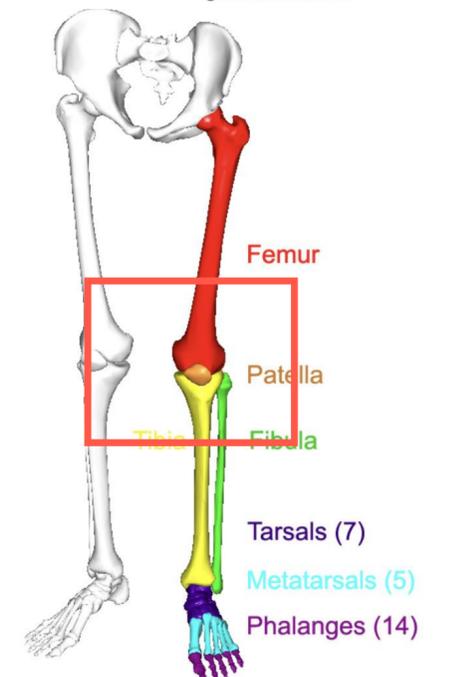
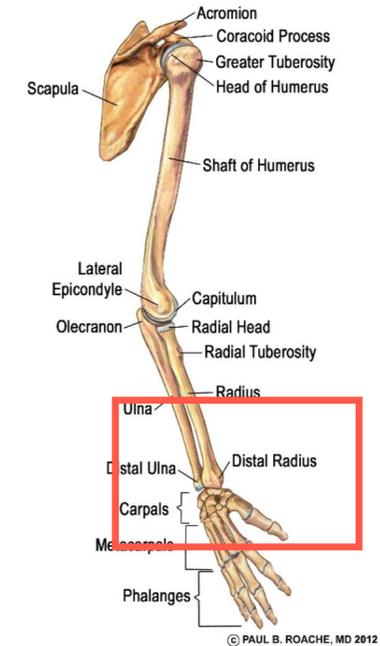
Surgery required for injuries around knee and wrist

Upper Limb injuries (37)

Injuries [n]	Total	Face to face out-patient clinic (n)	Surgery (n)
Upper Limb Injuries	37	30 [7 discharged virtually]	2
Soft Tissue injury	8		
Shoulder	3	1	
Elbow	2	2	
Wrist	1	1	
Hand	2	2	
Fractures	29		
Clavicle	3	1	
Proximal Humerus	2	2	
Radial Head	4	3	
Distal radius	9	7	2
Scaphoid	10	10	
Metacarpals	1	1	

Lower Limb injuries (19)

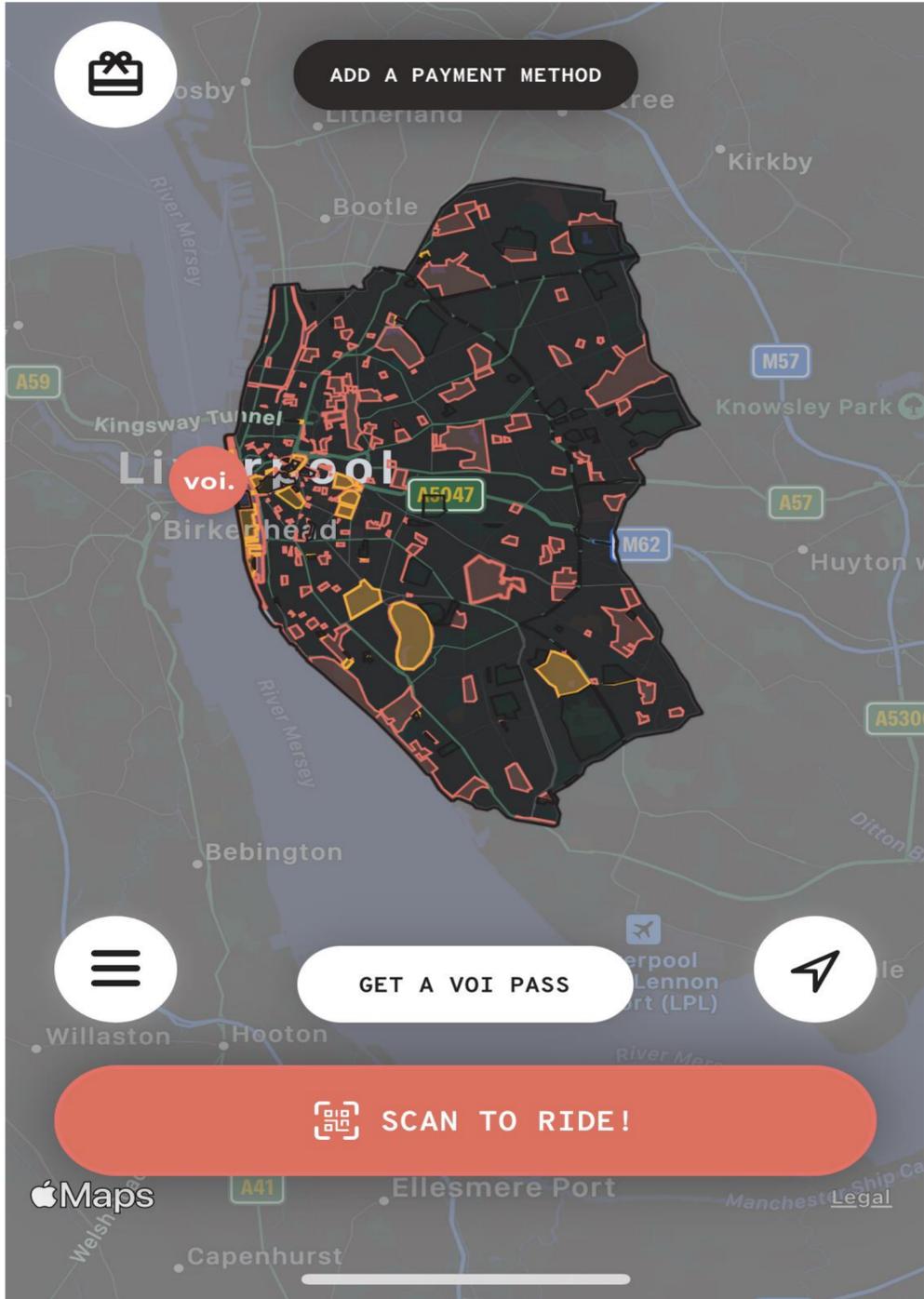
Injuries [n]	Total	Seen face to face in outpatient clinic (n)	Surgery (n)
Lower Limb Injuries	19	10 (5 discharged virtually, 4 directly to surgery)	4
Soft Tissue injury	6		
Knee	3	2	
Ankle	3	2	
Fractures	13		
Femur	2	1	2
Patella	1		1
Proximal Tibia	3	2	1
Hind Foot	2	1	
Mid Foot	2	1	
Forefoot	3	1	



Lower and upper injuries total 56 as some patients multiply injured

Liverpool Trial Voi Ride Area

Phone view



Dark pink: banned area
Orange: Slow area

Voi rules



1. Helmets are recommended

18+

2. For 18 year olds and up



3. One person per scooter

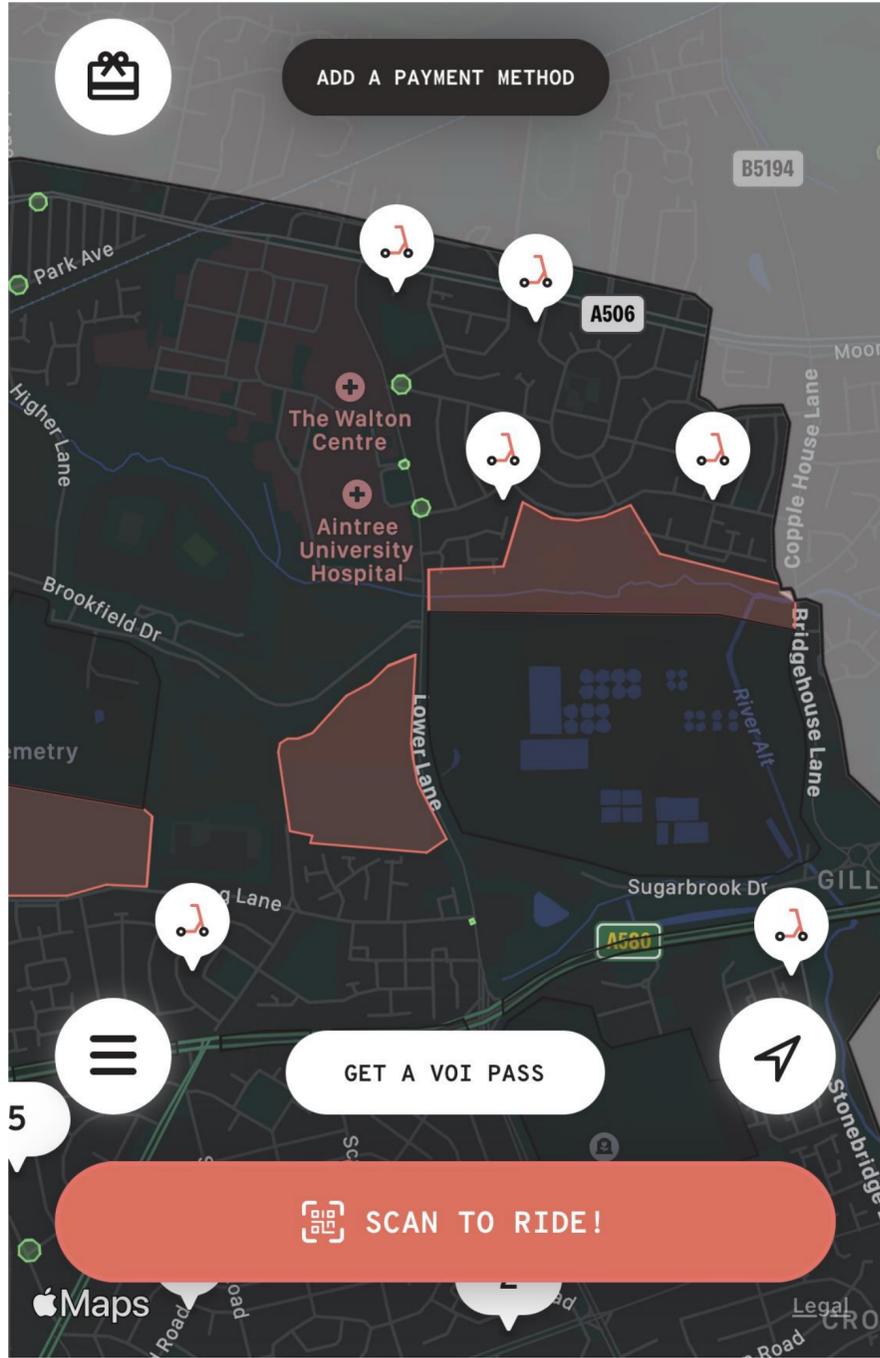


4. No riding under the influence of drugs or alcohol



5. Never ride on pavements

Selecting a ride



Factors at time of injury

- Data on 39/51 patients
- E-scooters are a fair weather, day phenomenon

Injuries

voi.

26

Privately Owned

13

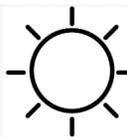
Weather (33)

Rainy



1

Sunny



18

Cloudy

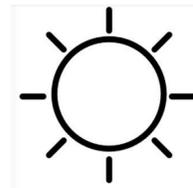


11

Variable

3

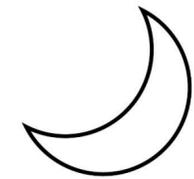
Time of day



22 Day-time



2 Dusk



13 Night

Causes



- Reported alcohol use: 4 patients



- Reported Drug use: None



- One patient reported 2 riders on one scooter

- One patient struck by a car - trauma call, diaphysial femur fracture

Injury rate

Voi injury rate

- 427,197 Voi rental scooter rides 6th Oct to 6th April
- Median rider age 22.0 (18-84 years)
- Mean ride duration 16.6 minutes, 2.33km
- Total of 995,369km ridden
- 26 Voi scooter injuries
- Voi injury rate of 0.0261 injuries/1000km



Department for Transport

Facts on Motorcyclist Casualties

June 2015



Casualty rate¹ per billion vehicle miles

Killed or seriously injured

Killed

injured

	Killed	Killed or seriously injured
Car occupants	2	21
Pedestrian ²	34	463
Pedal cyclist	34	1,036
Motorcycle users	114	1,789

1 Rates calculated using traffic figures

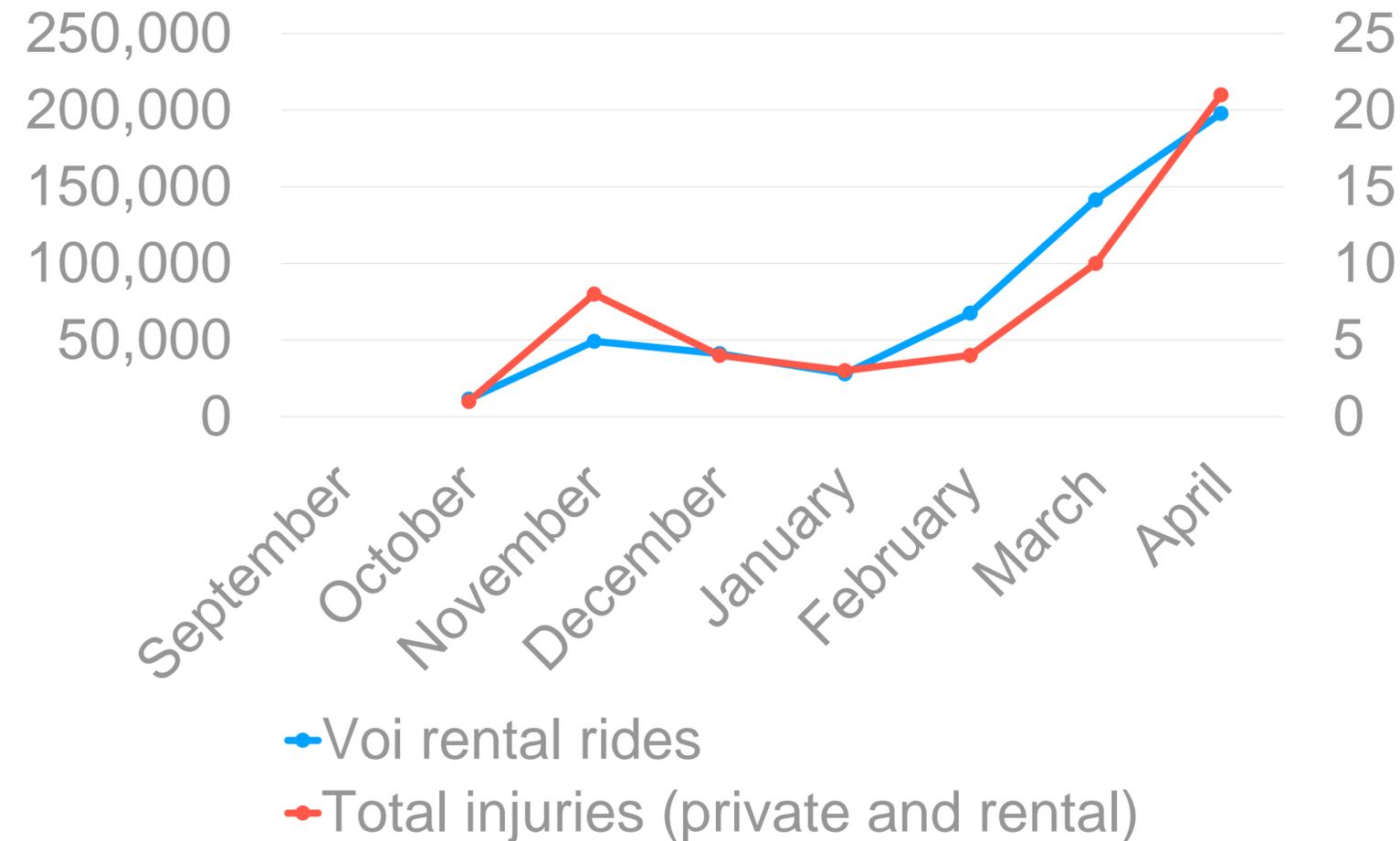
2 National Travel survey data used to calculate pedestrian rates.

NTS data based on England only resident sample.

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/447673/motorcyclist-casualties-2013-data.pdf

0.0261/1000km=
16,325 injuries / billion vehicle miles voi.

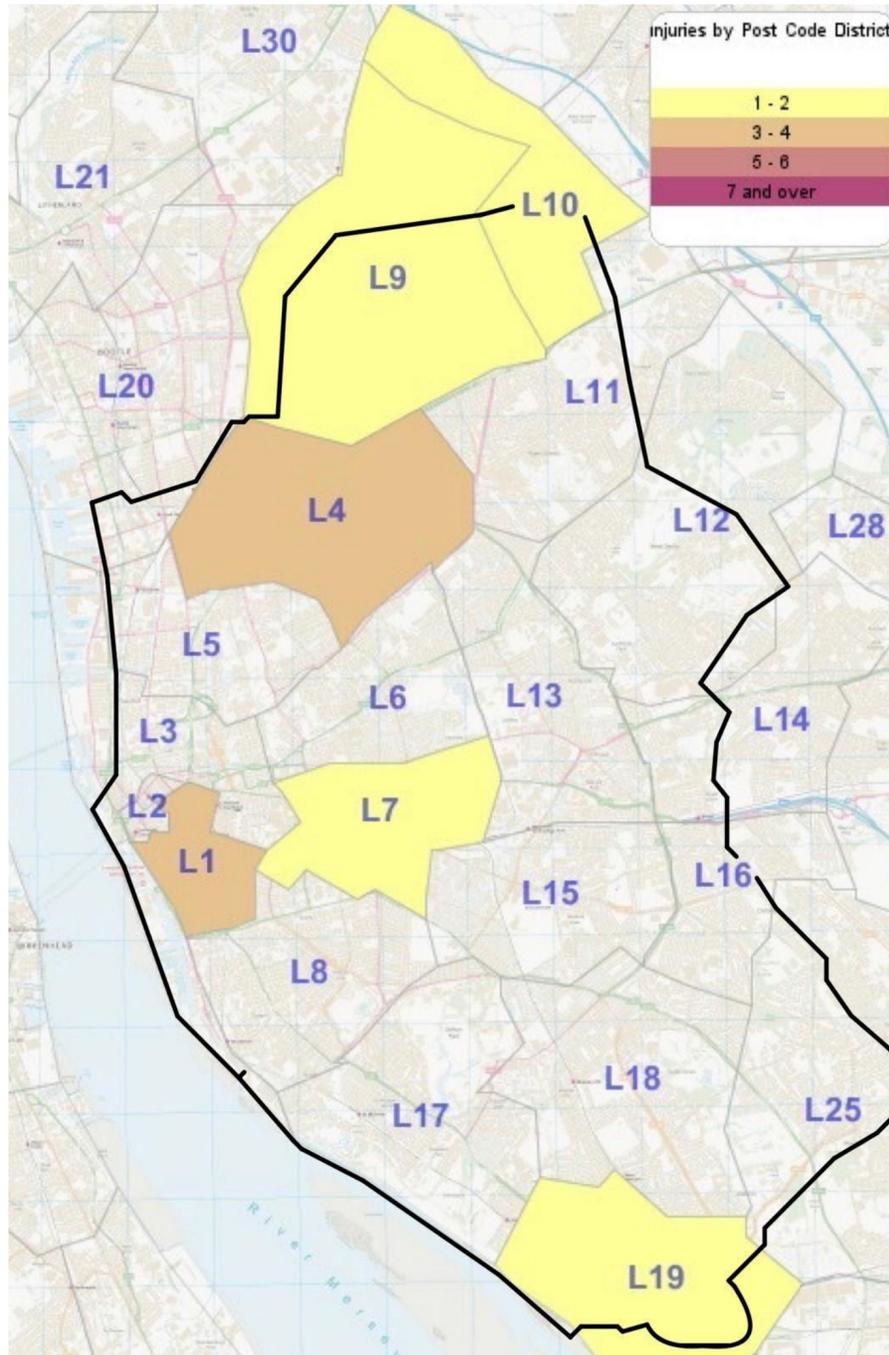
Total Injuries follows number of rental e-scooter rides



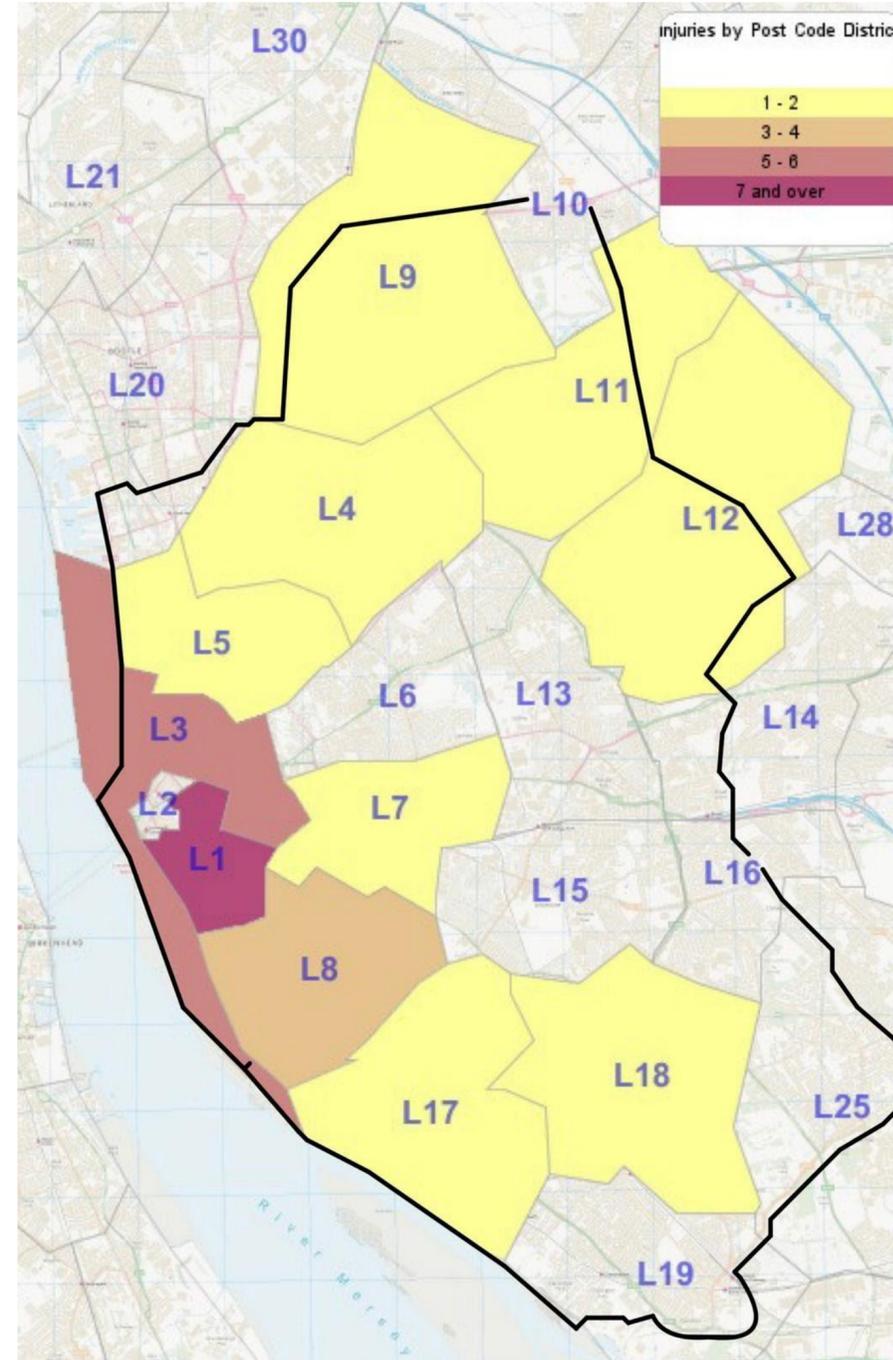
Pearson's coefficient of linear correlation: 0.9368
Injuries correlate strongly with rental scooter rides

Comparative maps of injuries

Voi Scooters



Private Scooters



Conclusions

- Increase in injuries since introduction- more upper limb
- Ongoing monitoring of cases
- Similar injury profile to bicycles
- X10 injury rate to motorbikes

Further work

Voi Interventions:

- Ban/slow accident-prone areas on Voi map

City Council Interventions:

- Police private scooters in pedestrianised areas
- Behavioural science unit to 'nudge' helmet and safe riding