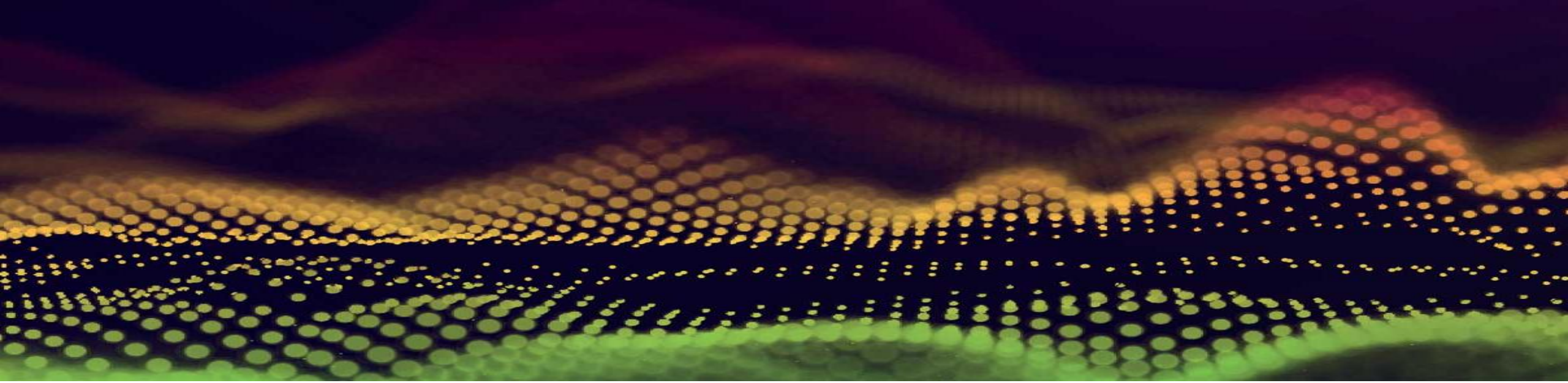

Understanding the heterogeneity in cycling behaviour of disabled people

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Urban Big Data Centre

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Motivation

"Representatives from disability organizations expressed strongly negative views on the impacts of road space reallocation…

The finding that 48% of disabled people in Scotland have no access to a car conflicts with key informants' reports that disabled people are disproportionately disadvantaged by removal of car parking. "

(Douglas et al., 2023)

https://wheelsforall.org.uk/wheels-for-all



Wheels for All

Wheels for All embraces disabled people and people who would otherwise not be able to cycle, through providing fun and friendly activity in 28 locations across the country. On our locations map, you will find details for our 28 Wheels for All centres plus information on other inclusive cycling provision across England and Wales. Click on Find a Centre to find one near to you.

Literature on disability and cycling

- The built environment is a key barrier to cycling and is often cited by disabled people (Cox and Bartle, 2020; Dogra et al., 2025).
- Access controls on traffic-free routes can make them inaccessible to people using adapted cycles (Larrington-Spencer, 2025). Cycle parking may be unsuitable for adapted cycles (Oliveira Soares and Glaser, 2025).
- Many quantitative studies look at what variables are correlated with cycling behaviour (e.g., Beenackers et al. (2012), Sahlqvist and Heesch (2012)), but it is rare for disability to be considered. If it is considered, it is often included as a binary variable focussing on physical disability or mobility difficulties.
- Georgescu et al. (2024) highlight the heterogeneity in needs within and between groups with different types of disability in terms of active travel.

Research gap and research questions

- Substantial *qualitative* evidence base of the relationships between cycling and disability.
- Limited *quantitative* research in this area.
- Existing quant work does not consider the diversity of relationships with cycling for disabled people.

We therefore focus on two research questions:

1. How do different impairments affect the propensity of a person to cycle?
2. How do these impacts vary with age and sex?

Social model of disability

- Medical model focuses on what people are unable to do
- We use the social model of disability which focuses on identifying and removing barriers caused by infrastructure, system design, funding models etc.
- Aldred and Woodcock (2008) argue that car dominance itself can act as a disabling factor for many people

Diversity in impairments (NTS)

- Vision (for example, blindness or partial sight)
- Hearing (for example, deafness or partial hearing)
- Mobility (for example, walking short distances or climbing stairs)
- Dexterity (for example, lifting or carrying objects, using a keyboard)
- Learning or understanding or concentrating
- Memory
- Mental health
- Stamina or breathing or fatigue
- Socially or behaviourally (for example, associated with autism, attention deficit disorder or Asperger's syndrome)
- Speech
- Other
- None of the above

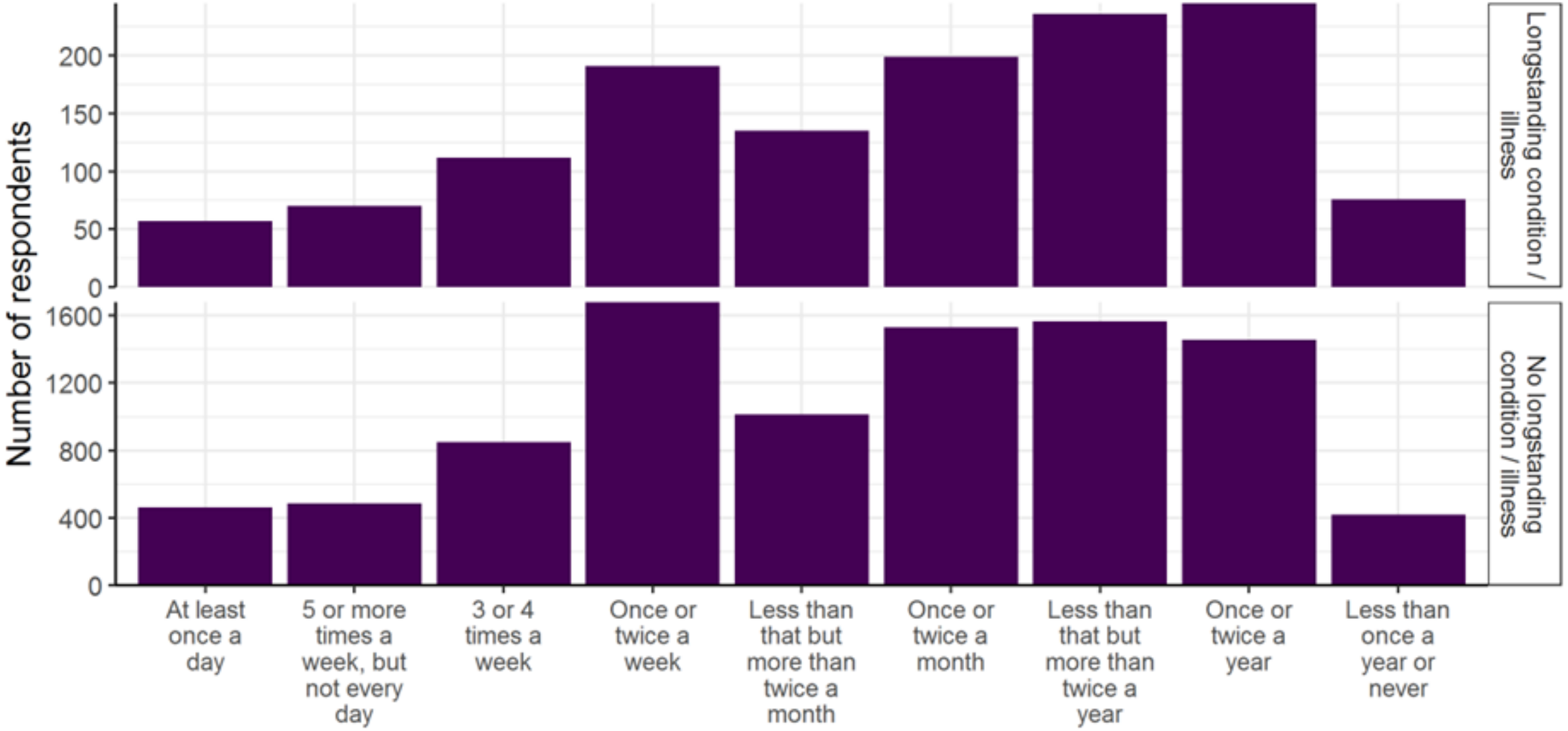
Methodology

- Quantitative analysis of secondary data
- National Travel Survey for England from 2018 and 2023 (cross sectional survey, fairly representative sample)
- People aged 18 to 64
- Sample size ~38k – includes disabled and non-disabled people
- Statistical models developed for the full dataset and then separate models for ‘younger’ and ‘older’ people plus models by sex

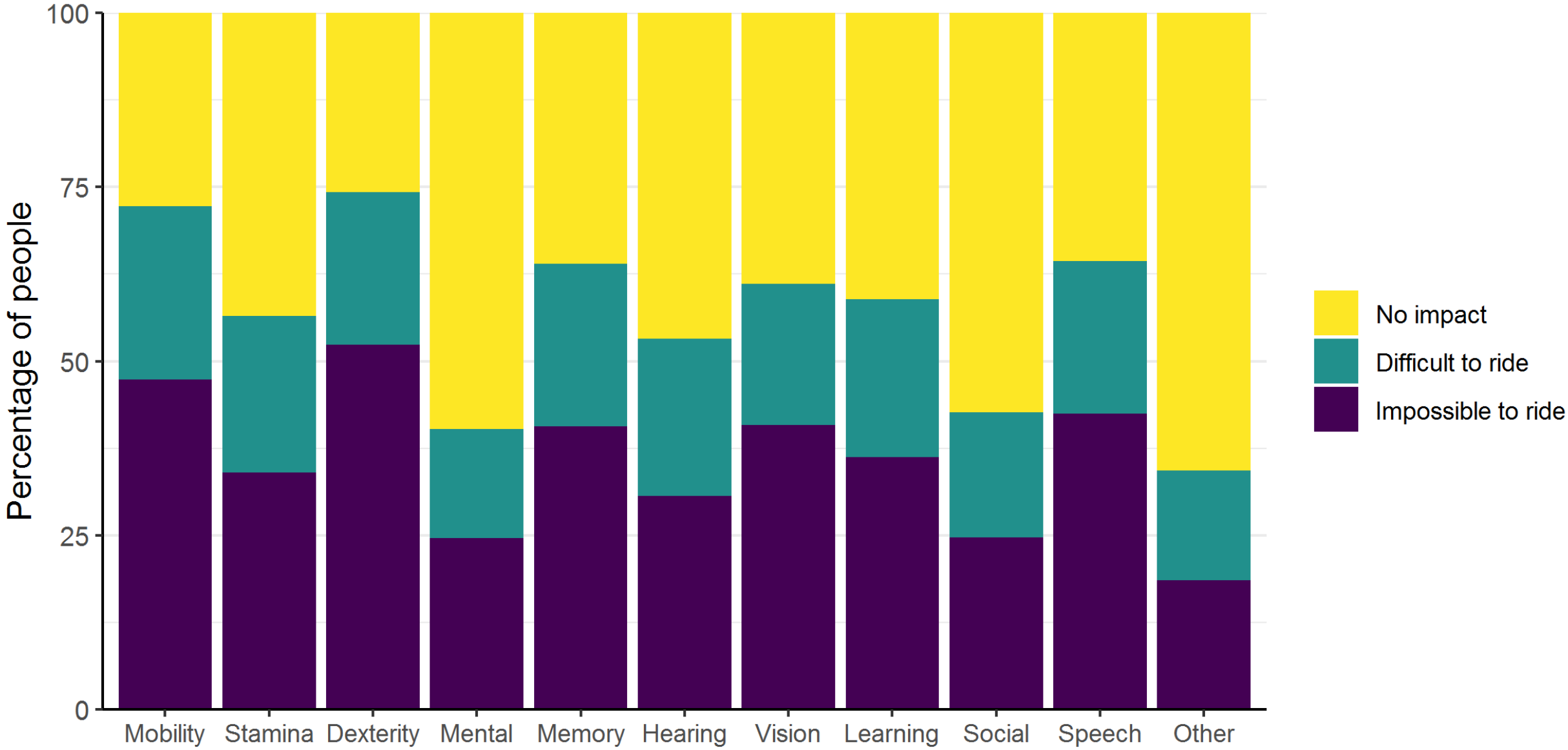
Statistical models

- The choice of variables is based on Tortosa et al. (2021)
- Our dependent variable is whether someone has ridden a bicycle in the past year
- Control variables are: age, sex, ethnicity, education, economic status, household income quintiles, whether the household has a child, whether it is a single parent household, driving license possession, access to car, area type (7 urban/rural categories), survey year, and total distance travelled in the travel diary week
- Binary logistic regression models are estimated

Cycle frequency



Descriptive comparison of cycling by impairment



Cycling and disability

- The percentage of disabled people who have cycled in the past 12 months is 24.8% and this compares to 38.1% for non-disabled people.
- From the statistical model, control variables exhibit expected patterns:
  - Cycling rates higher for people in their 40s and lower for people in their 60s.
  - White men, students, higher incomes more likely to cycle.

Overall model – impairment coefficients

	Full sample
Stamina	-0.33***
Mental	-0.20**
Hearing	-0.02
Memory	-0.21
Social	0.19
Mobility	-0.87***
Speech	-0.16
Dexterity	-0.24*
Learning	0.31*
Vision	-0.16
Other	-0.19

***p < 0.001; **p < 0.01; *p < 0.05

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Differences by age group

	Aged 20-34	Aged 50-64
Stamina	0.11	-0.65***
Mental	-0.17	-0.41**
Hearing	0.33	-0.36
Memory	-0.36	0.04
Social	0.05	0.26
Mobility	-0.64***	-0.83***
Speech	-0.31	0.07
Dexterity	-0.05	-0.40**
Learning	0.38	0.33
Vision	-0.2	-0.19
Other	0.22	-0.23

***p < 0.001; **p < 0.01; *p < 0.05

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Differences by sex

	Male	Female
Stamina	-0.40***	-0.27**
Mental	-0.12	-0.29**
Hearing	0.21	-0.39
Memory	-0.22	-0.20
Social	0.00	0.37
Mobility	-0.86***	-0.87***
Speech	0.10	-0.55
Dexterity	-0.16	-0.32*
Learning	0.34	0.24
Vision	-0.28	-0.06
Other	-0.40*	0.00

***p < 0.001; **p < 0.01; *p < 0.05

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Implications

- Accommodations vary across and within impairments:
  - E.g. mobility impairments may mean that adapted cycles are required, whilst mental impairments may mean that people require quieter routes or training to increase confidence.
  - Men seem to be more affected by stamina impairments than women, so different types of interventions might be required (e-bike availability/promotion? Challenge perceptions of masculinity?)
- Data collection on disability and on cycling:
  - Do questions about 'riding a bike' include adapted cycles?
  - Include questions about impairments in transport surveys?
  - Target more disabled people to increase sample sizes for intersectional analysis?

Conclusions

- A variety of impairments should be considered in planning infrastructure and behaviour change policies
- Mobility impairment has a strong negative effect (as might be expected from the literature) but others have an impact too
- Potentially higher rates of cycling for people with learning impairments
- Age impacts more severe even from early 50s
- Sex differences for some impairments but not others

Avoid assuming that disabled people are a homogeneous group and that they do not want to or are not able to cycle!!!

Thank you for listening!

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