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Fare-reduction vouchers for pupils on public transport: methodology and first results

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Agenda

- Background
- Study aim & research questions
- Literature review
- Methodology
- Response rate, non-response & sample characteristics
- First results & interpretations
- Summary & outlook

Background

- **09/2020 : Childrens parliament in the city** of Lucerne wants to support families to use more public transport
- **05/2021** : Lucernes **city council** has accepted this mandate
- **6/2023 : New intervention**
Voucher worth CHF 300 for predefined public transport tickets for all pupils in schools of City of Lucerne (6 and 16 years; 2023, 2024, 2025).
- **Costs** : special credit of almost CHF 5 million Swiss francs for three-year pilot trial



Study aim and research questions (RQ)

Study aim : To evaluate the effects of PT vouchers on pupils' mobility behavior

- **RQ1** : Can modal split shifts be achieved in general?
- **RQ2** : Can the use of PT be **increased**?
- **RQ3** : Can the use of private cars be **reduced**?
- **RQ4** : Are there differences between travel purposes, especially for ...
 - school
 - leisure

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ÖV-Förderung durch Vergünstigung für Kinder und Jugendliche

18. August 2022

Kinder und Jugendliche zwischen 6 und 16 Jahren sollen ab Sommer 2023 Gutscheine im Wert von 300 Franken für den Bezug von Bus- und Bahnbilketten erhalten. Der Stadtrat will damit die Familien finanziell entlasten und wie vom Kinderparlament und vom Grossen Stadtrat gefordert, einen Anreiz zur Benützung des öffentlichen Verkehrs schaffen. Für einen dreijährigen Pilotversuch beantragt der

Literature Review: international

- Streets have traditionally been *multifunctional* public spaces (**playgrounds for children**). With mass motorization, they were transformed into *monofunctional* spaces reserved for cars (**Haefeli & Kaufmann 2009: 317**)
- There is a trend to accompany children on their way to school by car in Europe (**Haefeli & Kaufmann 2009: 320**)
- Decision making in the domain of mobility are strongly formed in childhood and adolescence (**Limbourg, Flade & Schönharting 2000: 8; VCÖ 1999: 9; Flade 1999: 107; Flade 1997: 3**)
- Research on mobility biographies shows that new events (e.g. free / reduced PT tickets) can lead to new mobility decisions (**Rabe, Miller & Lien 2002: 141**), especially in the early period of life (**Heinickel & Dienel 2006**)
- Free PT tickets - Mixed results:
 - replacement of short (<1 km) walking trips with bus, but decreased car use in urban London (UK) (**Green, et al. 2014**)
 - decreased proportion of walking trips in Tallinn (EST) (**Cats, et al. 2017**)

Literature Review: CH (see Sauter, 2019)

In general:

- **travel purposes of kids:** mostly leisure and education
- **MoTs for education:** by foot, bicycle & PT
- **MoTs for leisure:** by foot & motorized

Time series shows ...

- **increasing distances** of trips to and from schools
- **bicycles** continues to **decrease**
- ownership of PT passes is **increasing**
- private parental car for school trips lower as expected, it is only **occasionally in double digits** (Sauter 2019: 8)



Daniel Sauter, Urban Mobility Research, 2019



Mobilität von Kindern und Jugendlichen

Veränderungen zwischen 1994 und 2015
Analyse basierend auf den Mikrozensusen «Mobilität und Verkehr»

Mobilité des enfants et des adolescents

Evolution entre 1994 et 2015 - Analyse basée sur les microrecensements « mobilité et transports »

Mobilità di bambini e adolescenti

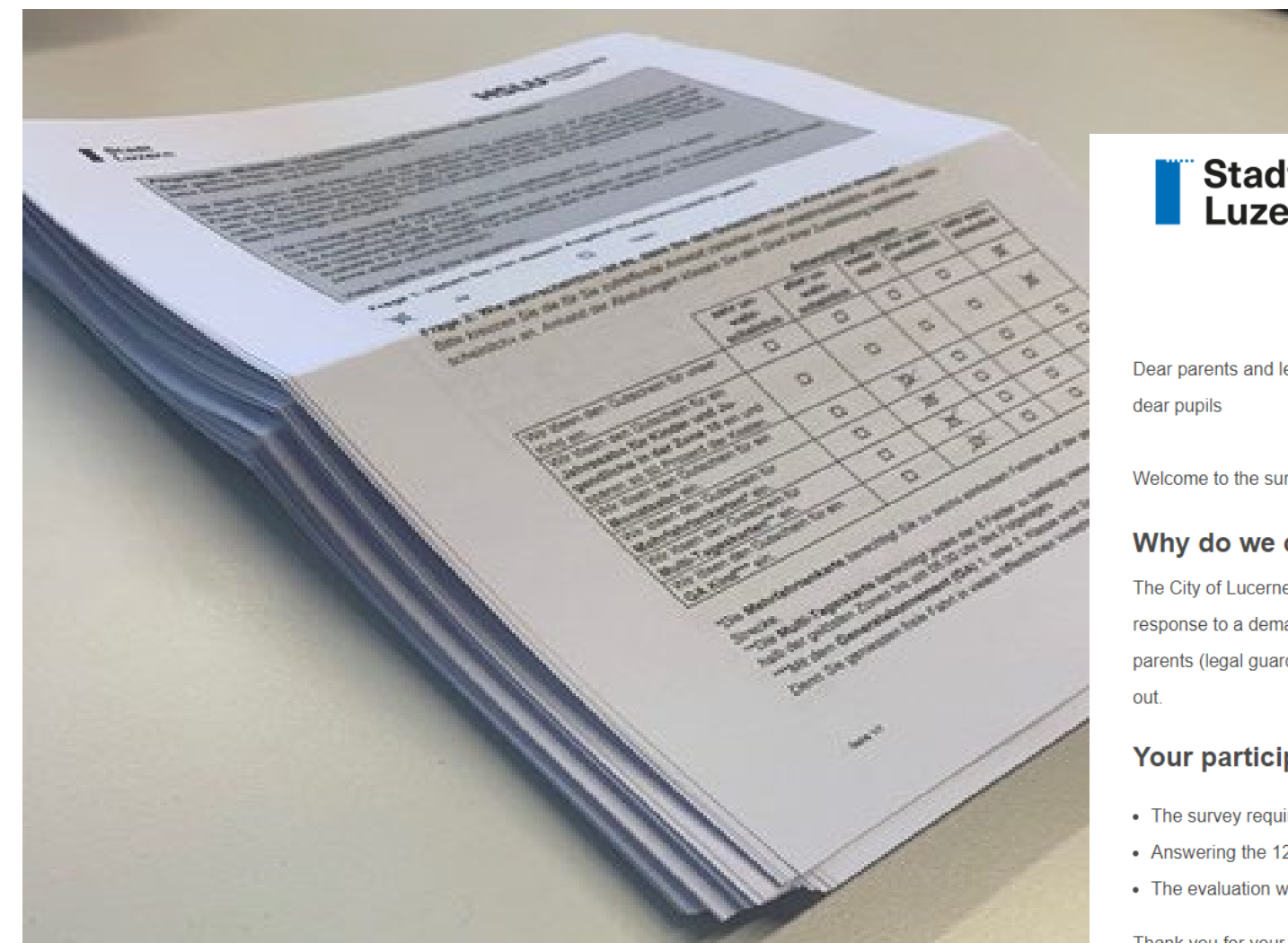
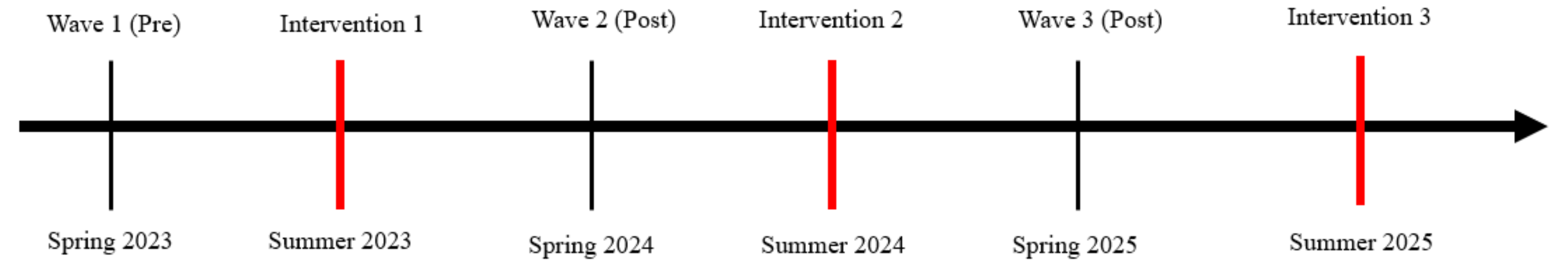
Evoluzioni dal 1994 al 2015 - Analisi basata sui microcensimenti «mobilità e trasporti»

Mobility of children and adolescents

Changes between 1994 and 2015 - Analysis based on the micro censuses «mobility and traffic».

Methodology (1)

- three-year **cross-sectional trend study**
- **intervention 1 - 3**: first **voucher** by mail in **mid-June 2023**, then summers of **2024** and **2025**
- standardized questionnaire
 - MoT usually used
 - mobility diary (Mon, Wed, Sat)
 - PT ticket ownership (household)
 - attitudes on mobility
 - age, gender, school, class



Stadt
Luzern

HSLU Hochschule
Luzern

Dear parents and legal guardians,
dear pupils

Welcome to the survey on the topic of "Mobility of pupils"!

Why do we collect and use your data

The City of Lucerne provides children and young people between the ages of 6 and 16 with a voucher worth 300 francs for the use of public transport. This is in response to a demand made by the Children's Parliament. Children should increasingly use public transport and travel independently. The voucher will be sent to parents (legal guardians) by post in mid-June 2023. The effect of the voucher will be measured over time in a pilot project. This is why this survey is being carried out.

Your participation is very important for obtaining meaningful results!

- The survey requires information about your school-age child.
- Answering the 12 questions will take about 10 minutes of your time.
- The evaluation will be anonymous.

Thank you for your participation!

☐ I agree to the processing of my personal data in accordance with the information provided herein

Methodology (2)

- **Cluster sampling** is based on the **registers** of elementary and secondary schools
- **addresses** of parents provided by the **local authorities**
- Cluster sampling steps (random selection):
 - 1) 8 schools out of 19
 - 2) 5 classes out of 8 schools (teacher announced the survey)
- **40 classes with 600 pupils (gross sample)**

	Number of classes in Lucerne (Universe)		Number of classes selected (Sample)	
	n	%	n	%
1st grade	59	18	6	15
2nd grade	22	7	1	3
3rd grade	66	20	9	23
4th grade	23	7	3	8
5th grade	62	19	9	23
6th grade	23	7	2	5
Secondary 1	24	7	3	8
Secondary 2	22	7	4	10
Secondary 3	21	7	3	8
	322	100	40	100

Response rate, non-response analysis and sample characteristics

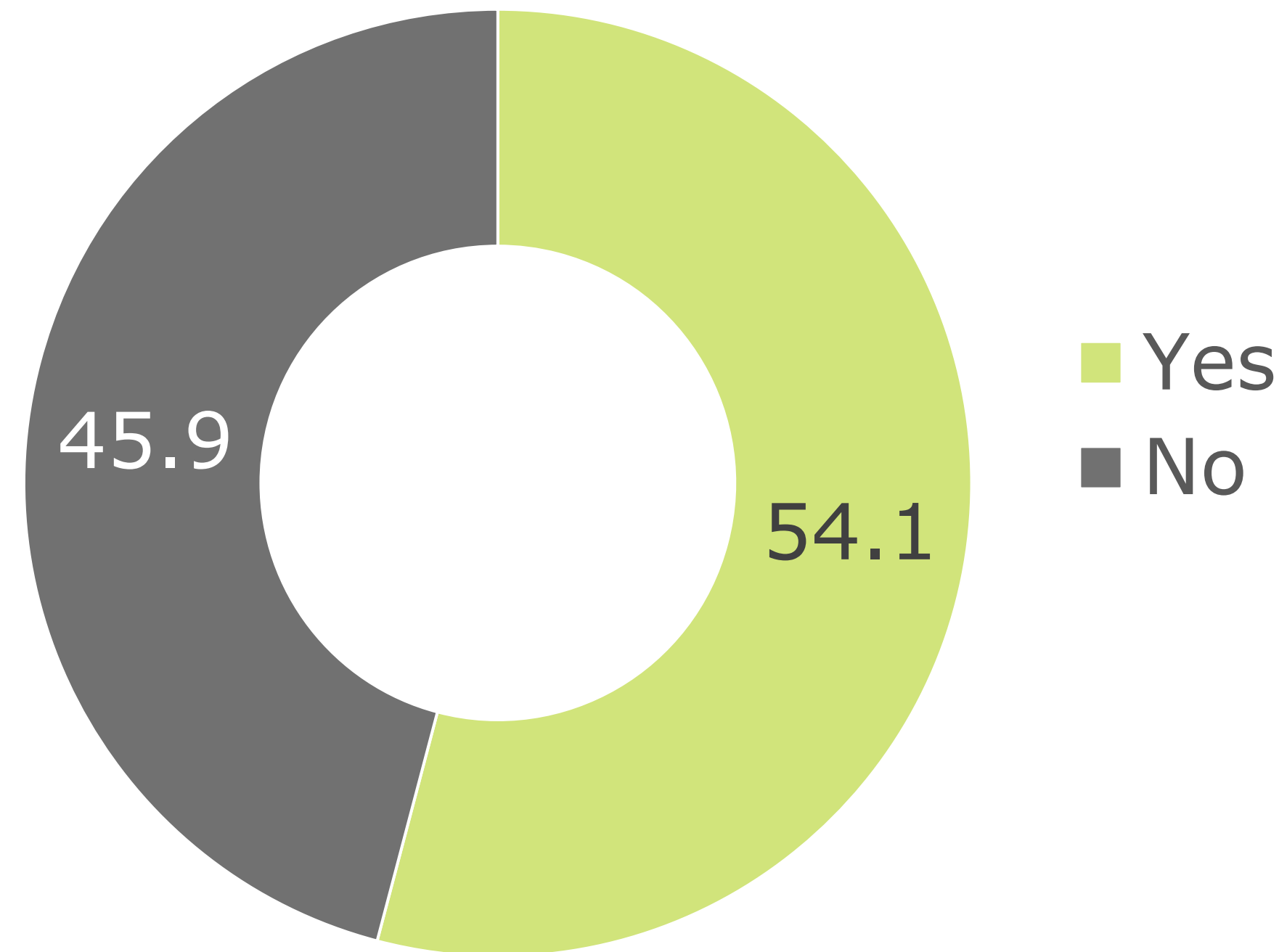
Gross sample		600	100%
Sample-neutral losses (relocations, etc.)		1	0.2%
Gross sample adjusted		599	99.8%
Response		333	55.5%
by language	... of which German	330	99.1%
	... of which English	3	0.9%
by mode	... of which written questionnaire	221	66.4%
	... of which online	112	33.6%

Response rate, **non-response analysis** and sample characteristics

	Universe		Sample	
	n	%	n	%
1st grade	614	12.64	21	6.40
2nd grade	590	12.15	21	6.40
3rd grade	612	12.60	45	13.70
4th grade	602	12.40	44	13.40
5th grade	596	12.27	39	11.90
6th grade	601	12.38	55	16.70
Secondary level 1	451	9.29	34	10.30
Secondary level 2	415	8.55	35	10.60
Secondary level 3	375	7.72	35	10.60
Own calculations				

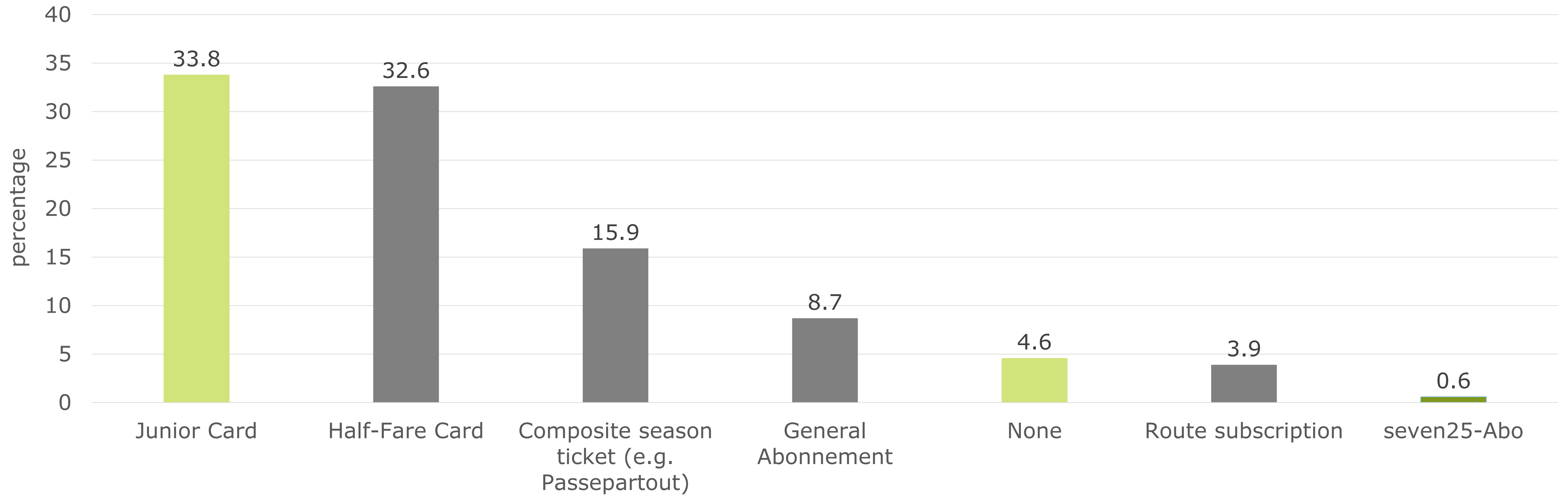
First results & interpretations

Have you already heard about this voucher offer? (percentages)



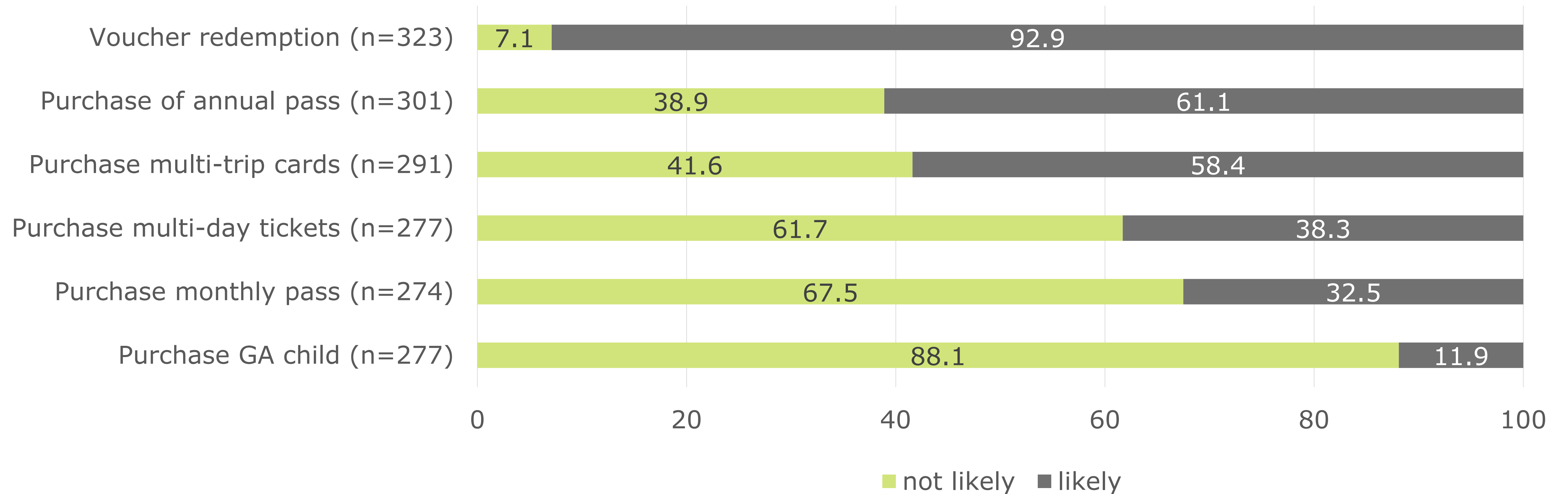
n = 319, own calculations

Does your household have one or more of the following public transport season tickets? (percentages, multiple answers)



n = 333, own calculations

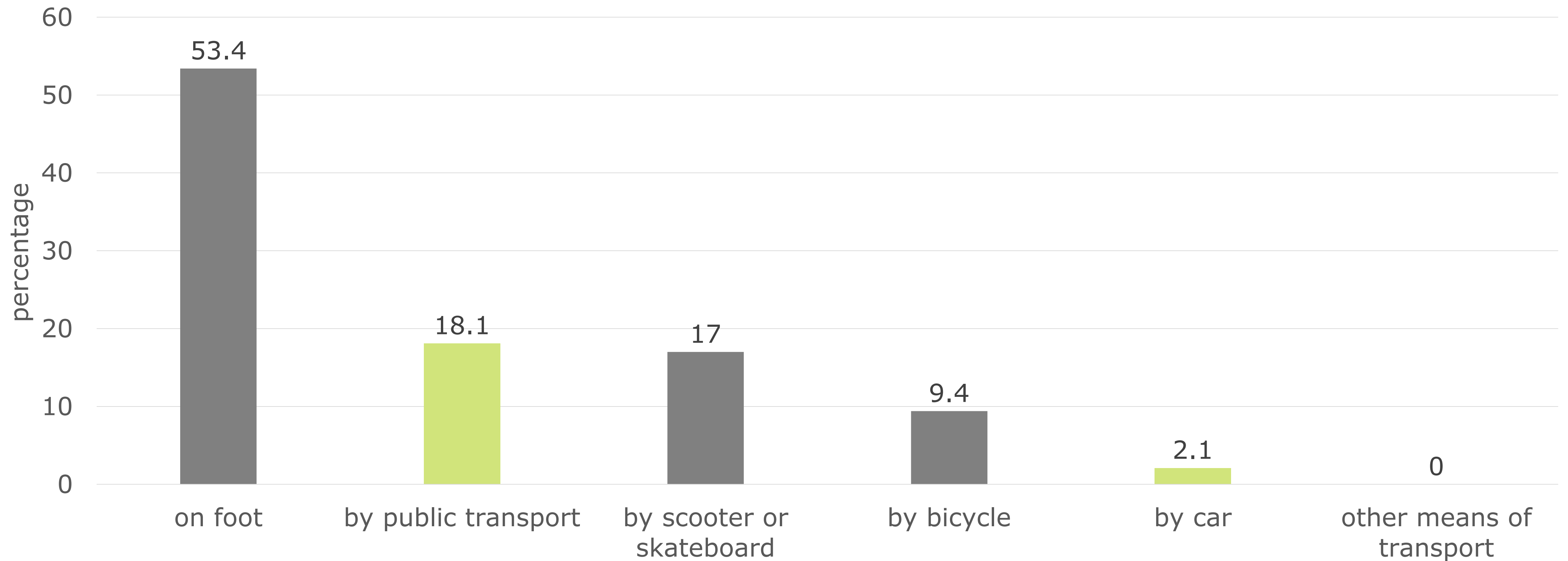
How likely are you to cash in the voucher for your child? (percentages)



n = 277-323, own calculations

How does your child usually get to school?

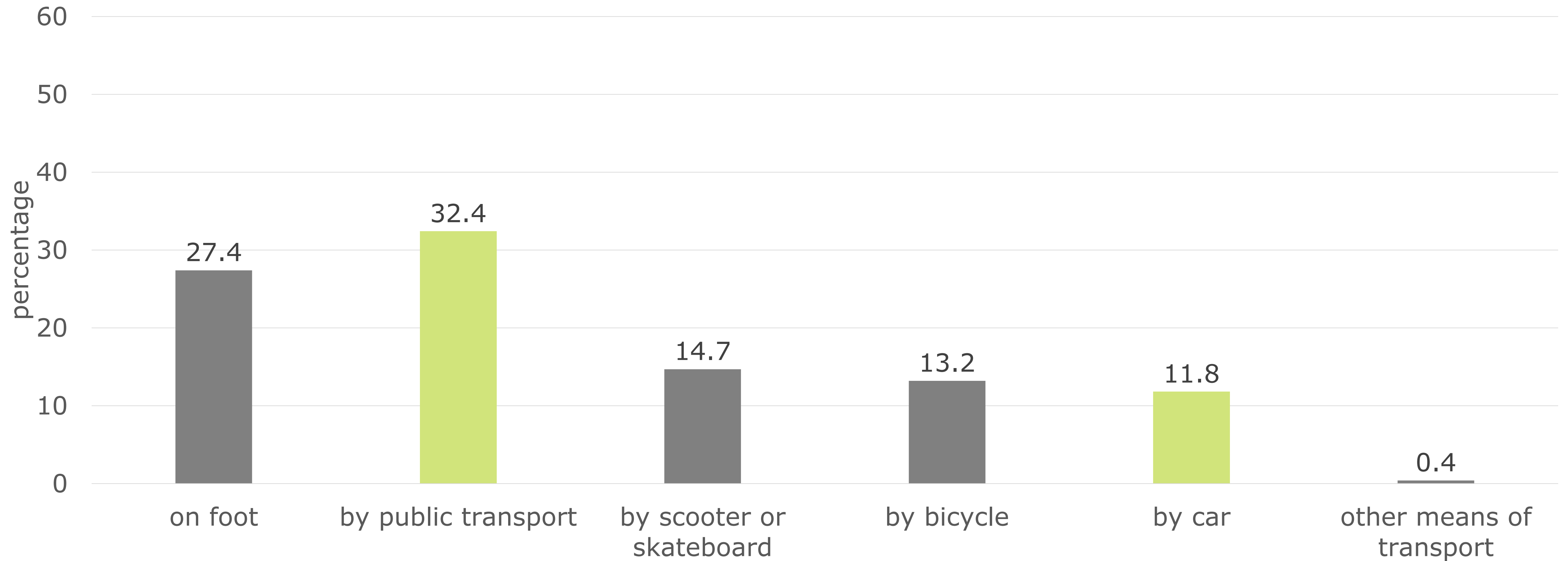
(percentages, multiple answers)



n = 530, own calculations

How does your child usually get to leisure activities?

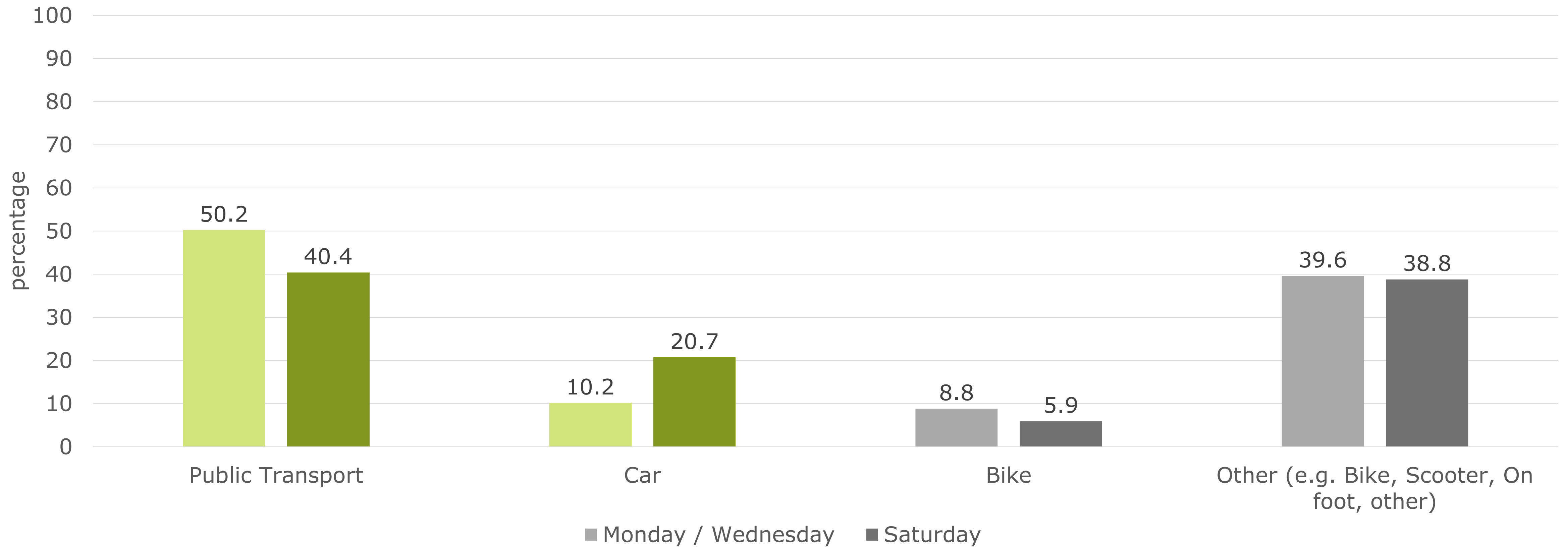
(percentages, multiple answers)



n = 780, own calculations

Mobility diary: Leisure trips

(Monday & Wednesday combined)

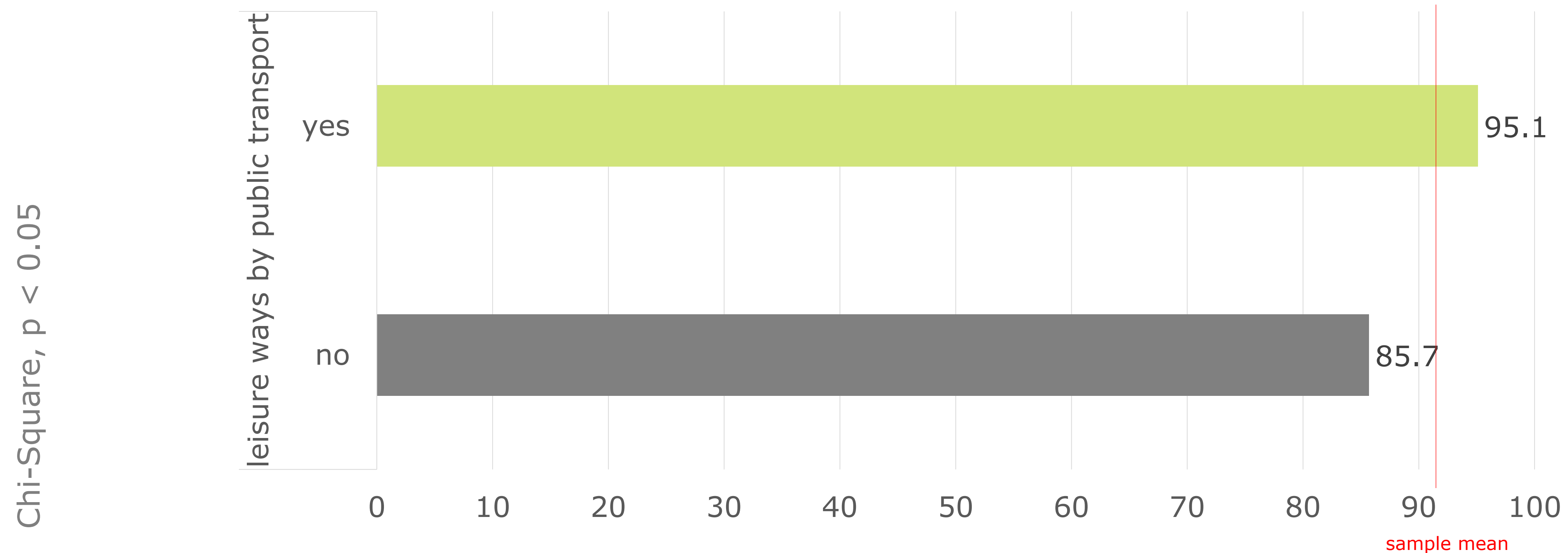


n = 227-270, own calculations

RQ 2: Can we increase PT use with the voucher ? – some hints

→ It is a one size fits all solution: free-rider effect or real mode-shift changes ?

Cash in the voucher is planned :

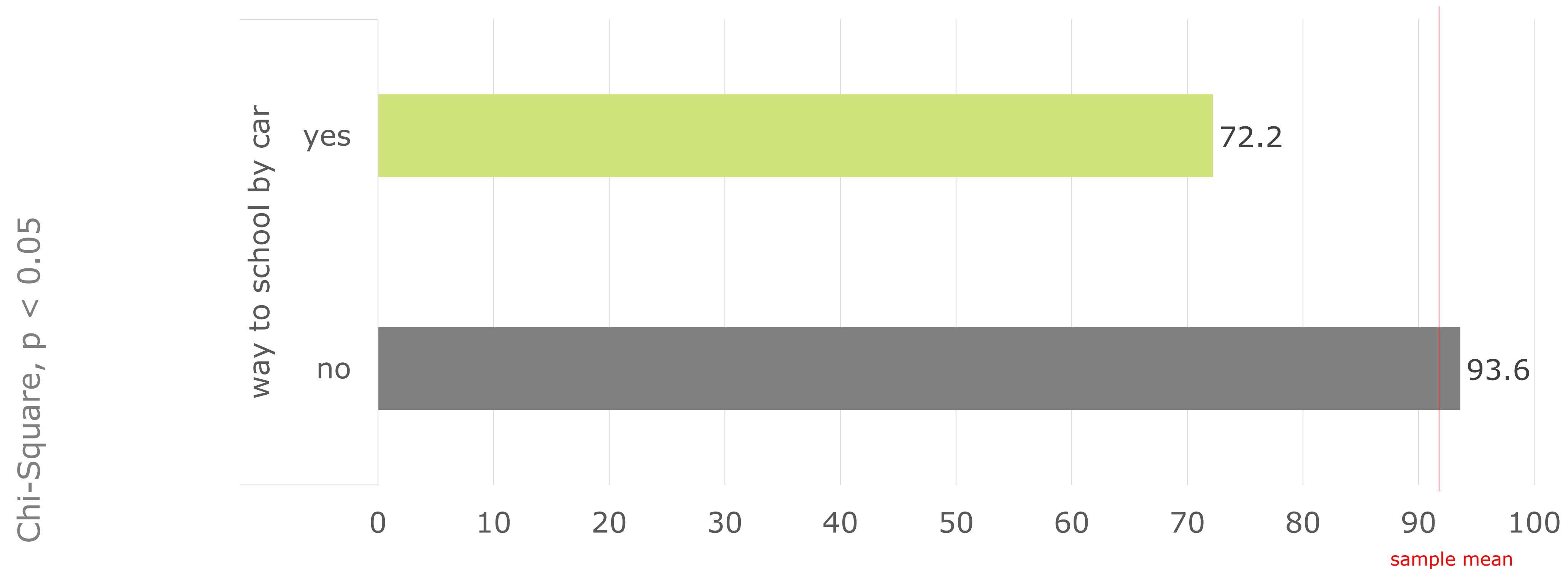


n = 323, own calculations, Sample mean of «Cash in voucher» yes: 92.9%

RQ 3: Can we decrease car use with the voucher ? – some hints

→ It is a one size fits all solution: free-rider effect or real mode-shift changes ?

Cash in the voucher is planned :



n = 323, own calculations, Sample mean of «Cash in voucher» yes: 92.9%

Summary & outlook

RQ 1: Have vouchers led to higher shares of public transportation and less car trips?

- **So far:** descriptives as a **base-line** & first indications regarding our RQs
- **Wave 1** clarifies the intention to cash-in the voucher and shows the *status-quo*
- **But:** changes introduced by the intervention will be visible after **wave 2**
 - Intention to cash-in the voucher (wave 1) can be compared with effective behaviour (wave 2)
“**intention-behaviour gap**” (actual sales provided by the transportation companies)
 - Trend analysis & Multi-group comparison: **Multivariate Modelling**
 - voucher users vs. non-users (between-subject design, quasi-experiment)
 - PT ticket types used etc.
- **Policy aim:** Decision basis for City of Lucerne to extent this intervention or not (year 2026)

Thank you for your attention!



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