

# MOBIS-COVID19/03: Results as of 20/04/2020

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June 03, 2020

## Abstract

On March 16, 2020, 3700 participants who completed the MOBIS study between September 2019 and January 2020 were invited to reinstall the GPS Logger and Travel Diary App ‘Catch-My-Day’, developed by MotionTag, to record their mobility behaviour during the period of special measures implemented to control the spread of the Corona Virus. The first 4 weeks of mobility data from the original MOBIS Study is taken for each participant as a baseline against which to compare current mobility patterns. These 4 weeks start place anywhere between 1st September and 15th November, depending on the participant. Only trips in Switzerland are currently considered, although data on cross border travel is available.



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**Arbeitsbericht Verkehrs- und Raumplanung 1494**

**April 2020**

## MOBIS-COVID19/03

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## Abstract

To slow down the spread of the coronavirus, the population has been instructed to stay at home if possible. This measure consequently has a major impact on our daily mobility behaviour. But who is being affected, and how? The MOBIS-COVID-19 research project, an initiative of ETH Zurich and the University of Basel, is a continuation of the original MOBIS study. The aim of the project is to get a picture of how the crisis is affecting mobility and everyday life in Switzerland.

## Keywords

GPS logger; Travel diary app; COVID-19; Corona virus; MOBIS; Mobility behaviour; Switzerland

## Suggested Citation

Molloy, J., C. Tchervakov and K.W. Axhausen (2020) MOBIS-COVID19/03: Results as of 20/04/2020, *Arbeitsberichte Verkehrs- und Raumplanung*, **1494**, IVT, ETH Zurich, Zurich.

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## Zusammenfassung

Um die Ausbreitung des Coronavirus zu verlangsamen ist die Bevölkerung angewiesen worden, wenn möglich zu Hause zu bleiben. Diese Massnahme hat daher einen grossen Einfluss auf unser tägliches Mobilitätsverhalten. Doch wer ist davon betroffen und wie? Das Forschungsprojekt MOBIS-COVID-19, eine Initiative der ETH Zürich und der Universität Basel, ist eine Weiterführung der originalen MOBIS-Studie. Ziel des Projekts ist es, ein Bild zu erhalten, wie sich die Krise auf die Mobilität und das Alltagsleben in der Schweiz auswirkt.

## Schlagworte

GPS logger; Travel diary app; COVID-19; Corona virus; MOBIS; Mobility behaviour; Switzerland

## Zitierungsvorschlag

Molloy, J., C. Tchervakov and K.W. Axhausen (2020) MOBIS-COVID19/03: Results as of 20/04/2020, *Arbeitsberichte Verkehrs- und Raumplanung*, **1494**, IVT, ETH Zurich, Zurich.

## Introduction

On March 16, 2020, 3700 participants who completed the MOBIS study between September 2019 and January 2020 were invited to reinstall the GPS Logger and Travel Diary App ‘Catch-My-Day’, developed by MotionTag, to record their mobility behaviour during the period of special measures implemented to control the spread of the Corona Virus. The first 4 weeks of mobility data from the original MOBIS Study is taken for each participant as a baseline against which to compare current mobility patterns. These 4 weeks start place anywhere between 1st September and 15th November, depending on the participant. Only trips in Switzerland are currently considered, although data on cross border travel is available.

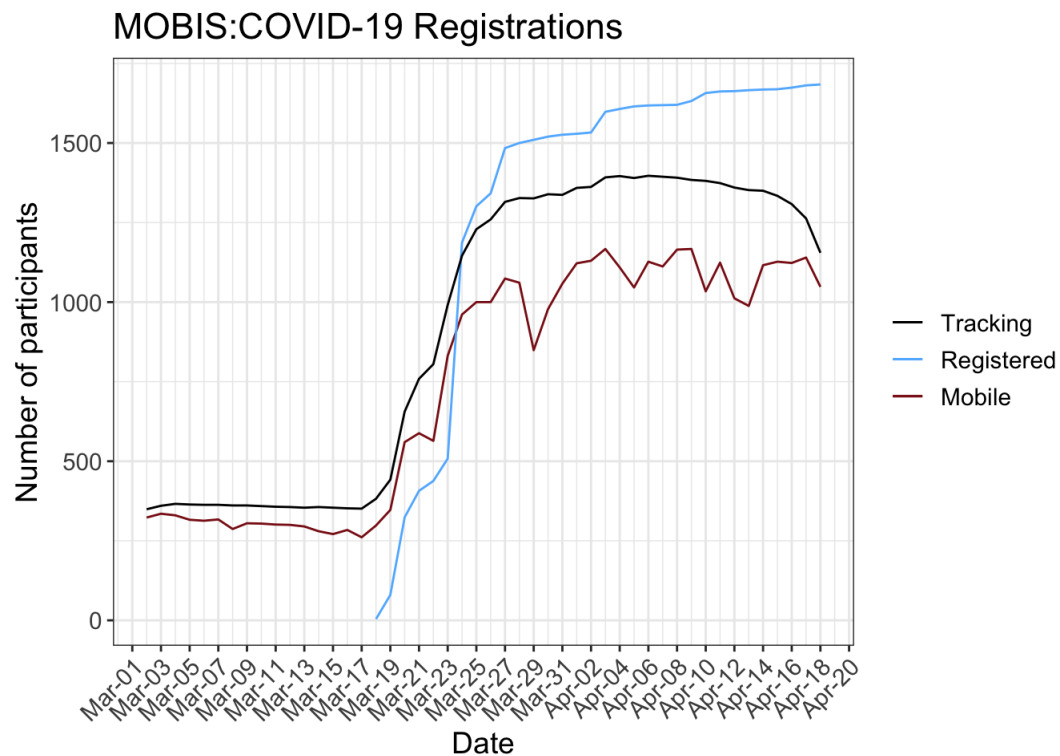
The following figure shows the number of registered and tracking participants per day. A running panel of around 250 participants were already tracking before the sample was reinvited. This allows results for the weeks before the MOBIS:COVID-19 study was officially started, although the sample size is a lot smaller, and hence the results.

In the MOBIS study, participants were only eligible if they used a car at least 3 days a week - which skews the sample away from the Swiss general population.

The number of tracking participants each day used to calculate the average daily values includes all participants who recorded tracks before or after that date. This allows the consideration of those who stay at home while still allowing for survey dropouts.

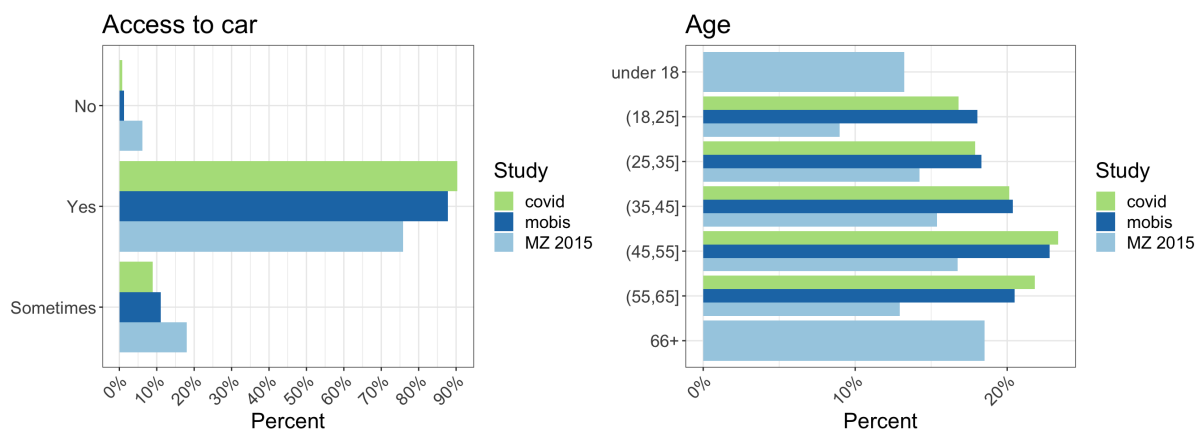
The GPS Travel diary used, Catch-My-Day (for iOS and Android) can have a 2-3 day delay before the tracks are available for analysis. The scaling by active participants accommodates for this, but the results of previous reports may change when the report is updated.

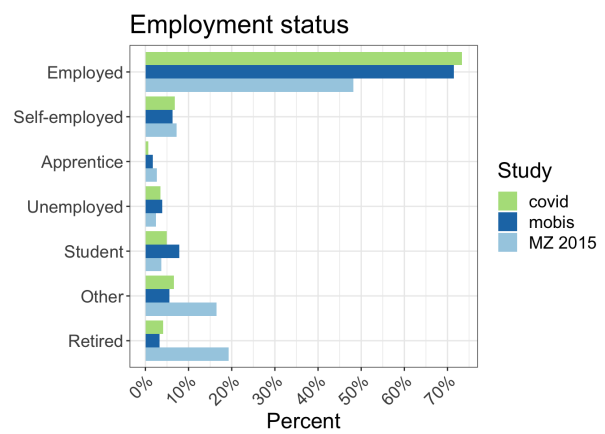
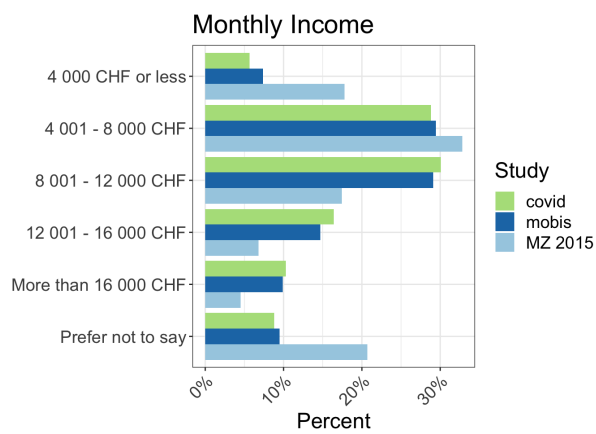
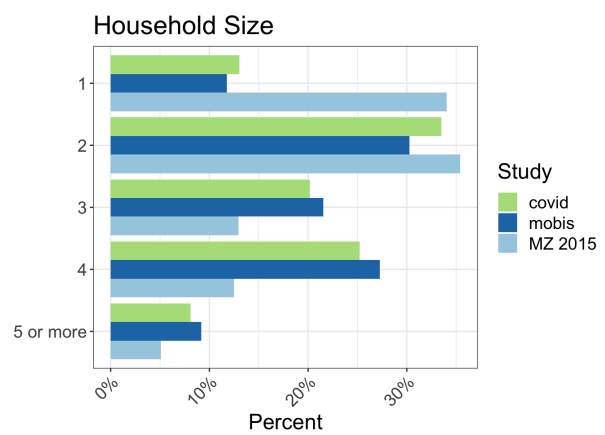
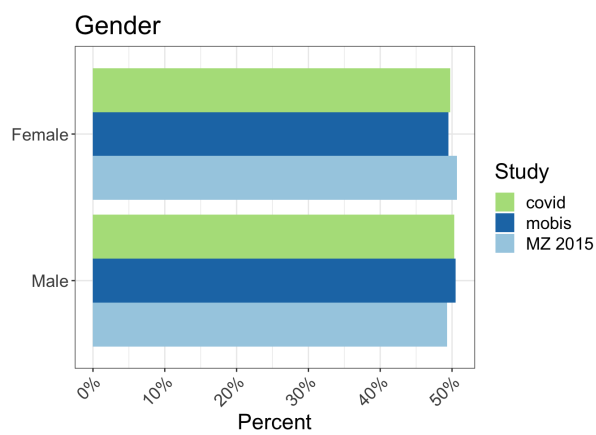
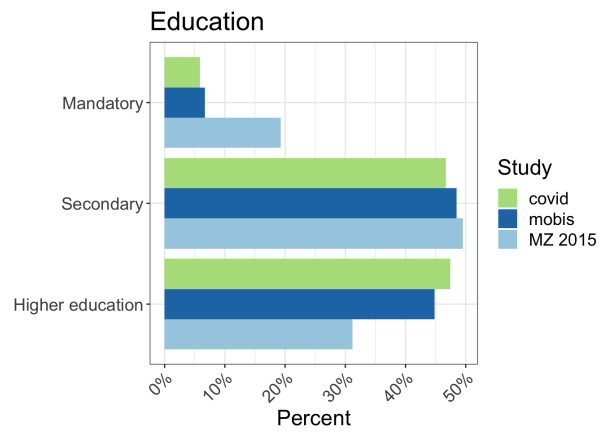
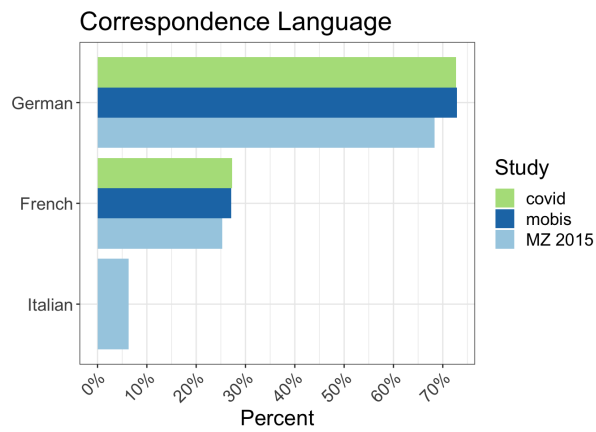
## Participation



## Differences in the distributions

The following charts show the characteristics of the MOBIS:COVID-19 sample compared to the original MOBIS Sample. There are some small differences, but generally the samples are consistent. This chart will be extended to compare to the relevant census data.





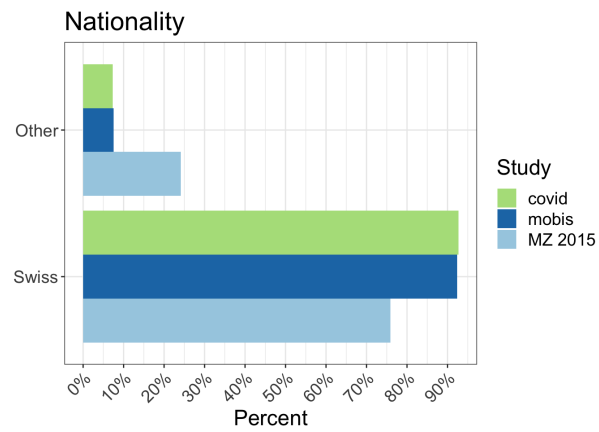
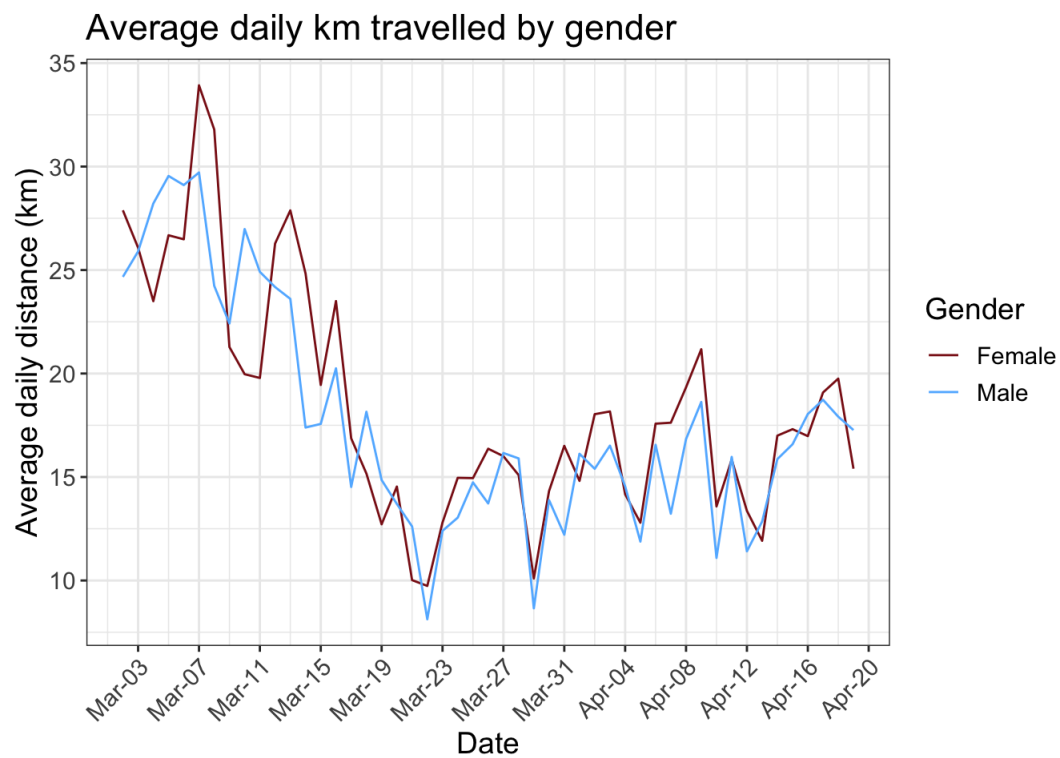


Table 1: Comparison with the last national travel diary Mikrozensus (MZ) 2015

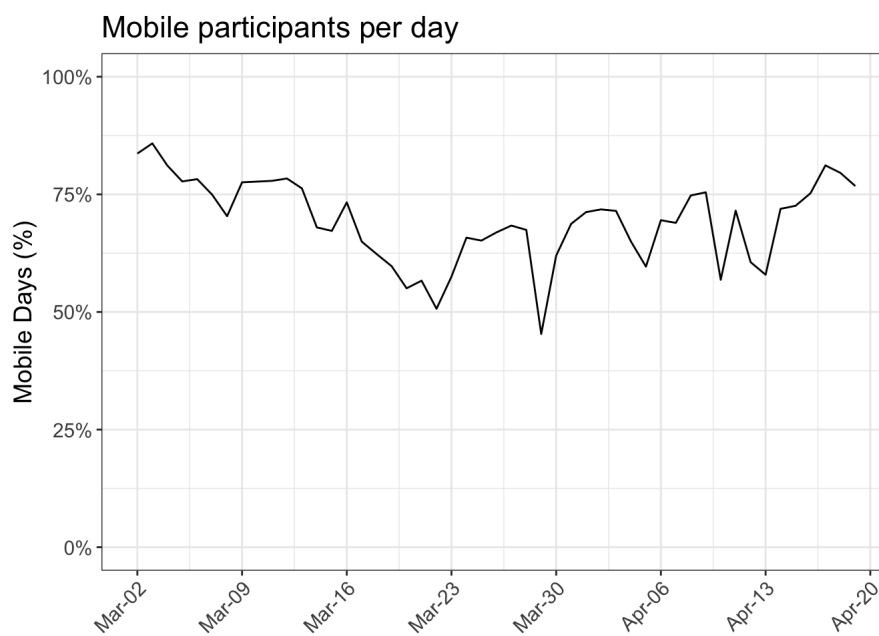
	N		%	
	Covid	MZ	Covid	MZ
<b>Aargau</b>	80	4,325	5.0	7.6
<b>Basel-Landschaft</b>	182	1,940	11.4	3.4
<b>Basel-Stadt</b>	37	1,555	2.3	2.7
<b>Berne</b>	187	7,244	11.7	12.7
<b>Fribourg</b>	8	1,942	0.5	3.4
<b>Geneva</b>	122	3,062	7.6	5.4
<b>Schwyz</b>	17	1,005	1.1	1.8
<b>Solothurn</b>	17	1,813	1.1	3.2
<b>Vaud</b>	286	5,303	17.9	9.3
<b>Zurich</b>	656	10,410	41.1	18.2
<b>Other</b>	3	18,491	0.2	32.4



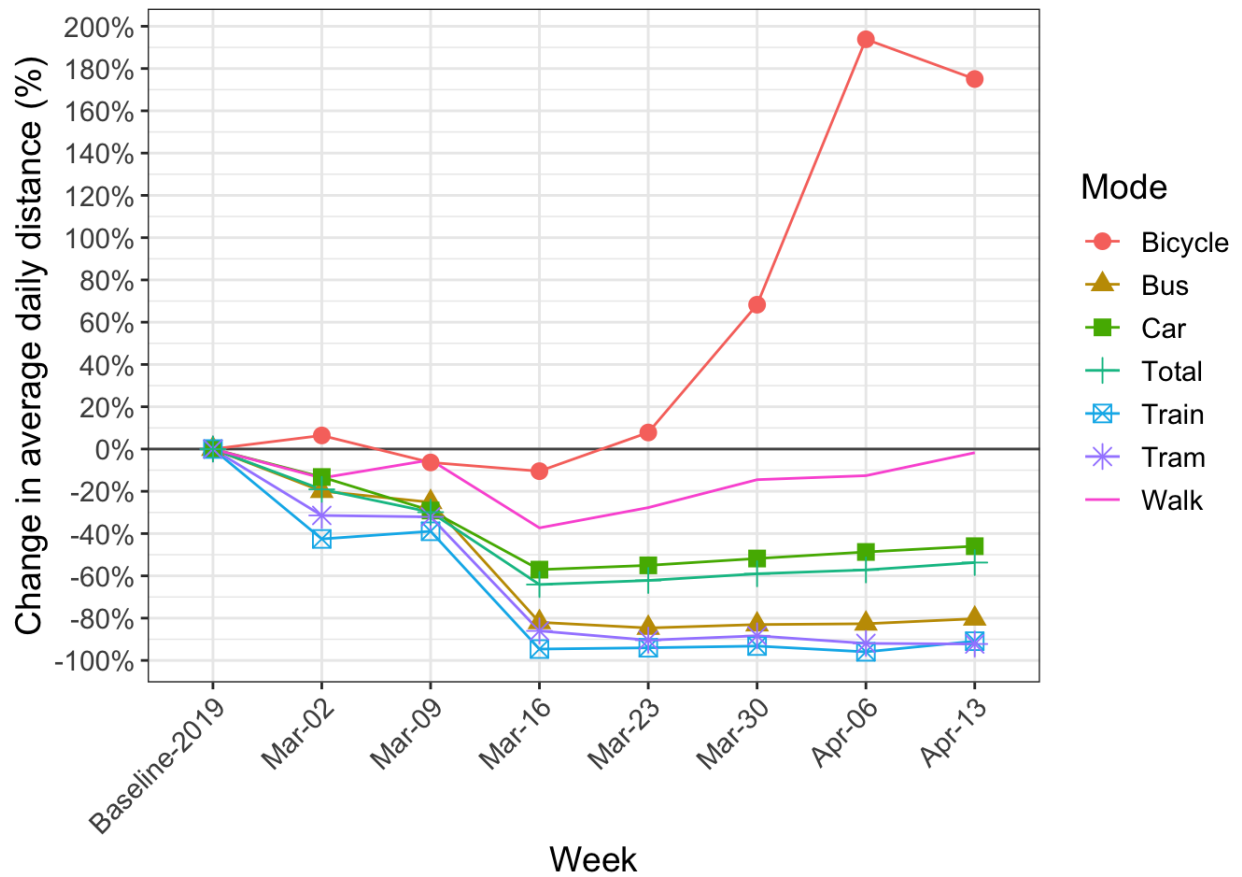
## Average daily distance



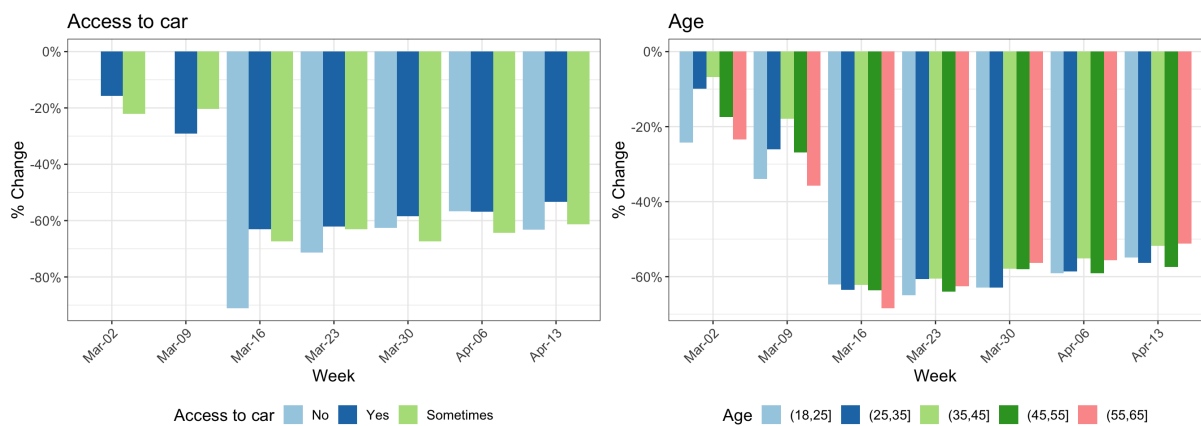
## Active days

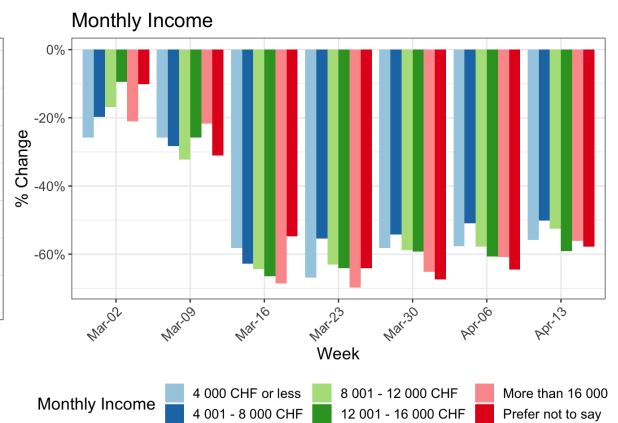
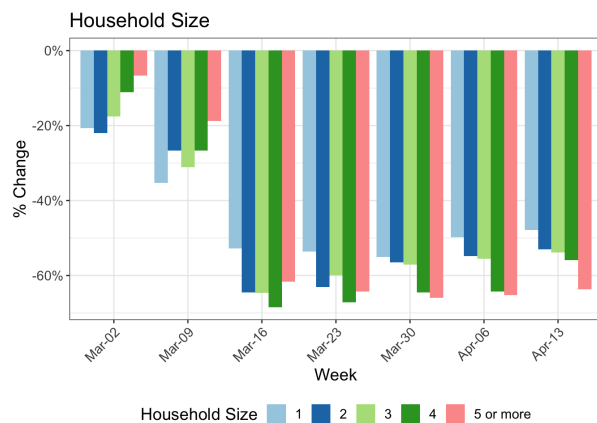
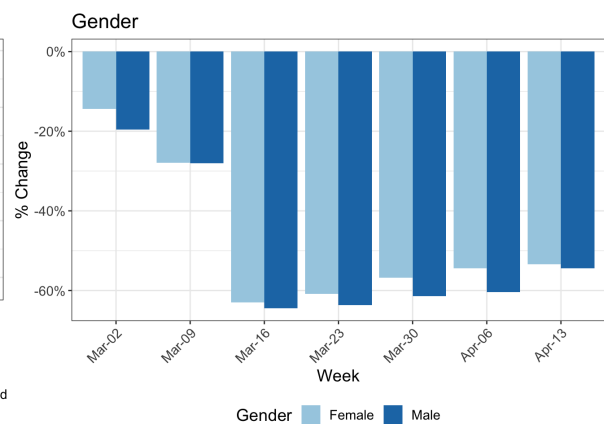
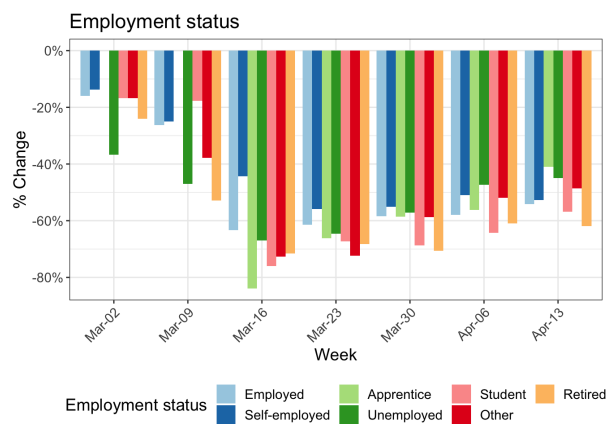
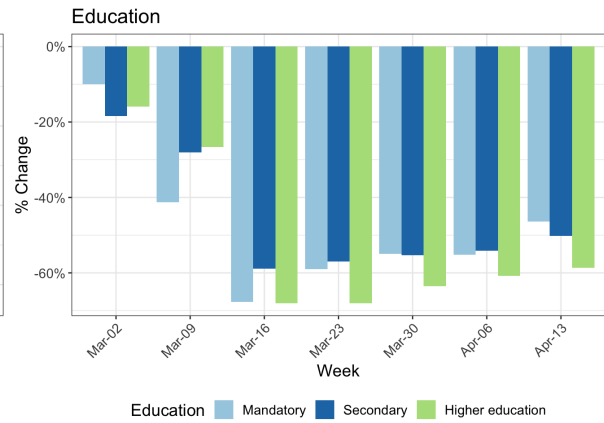
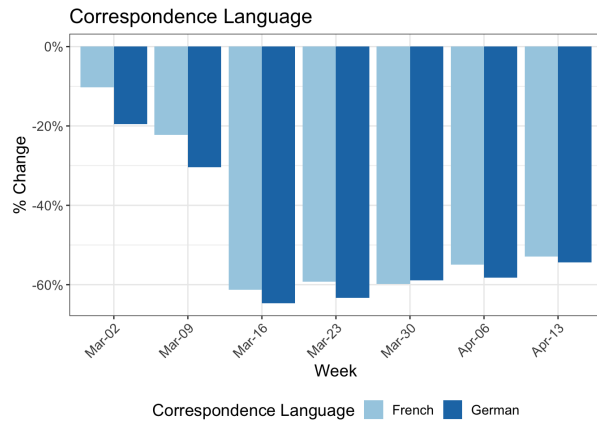


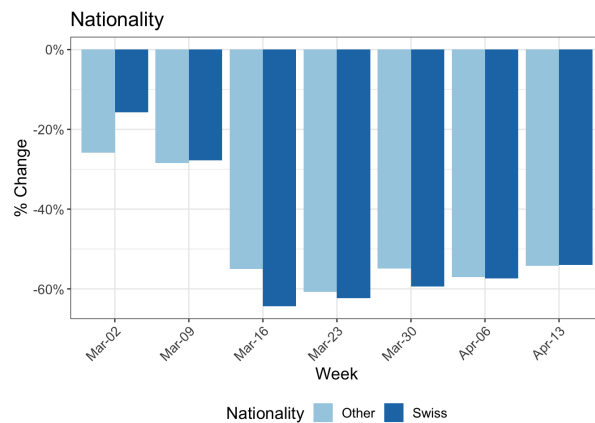
## Change in kilometers travelled by transport mode



## Change in kilometers travelled by:







## Reduction in kilometers travelled by Canton

Table 2: Change in kilometers travelled by home canton (%)

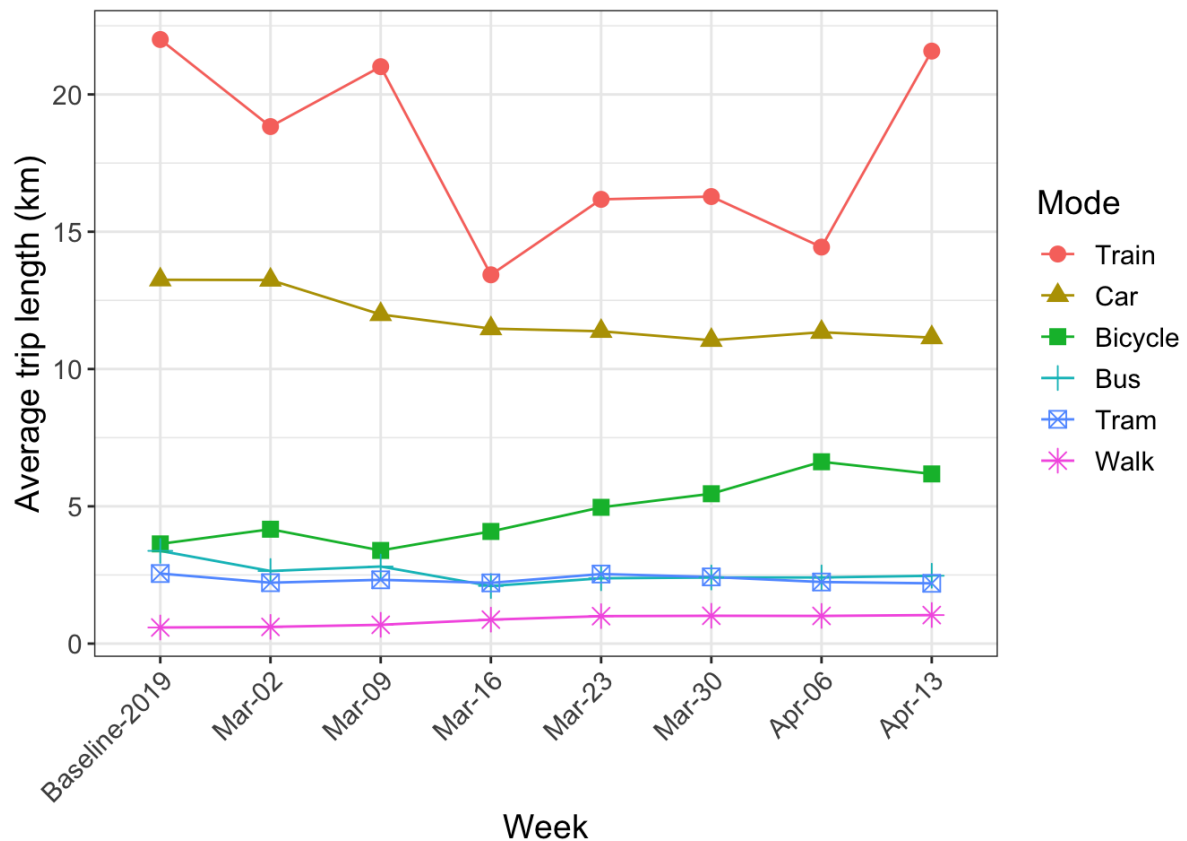
Canton	N	Mar-02	Mar-09	Mar-16	Mar-23	Mar-30	Apr-06	Apr-13
Aargau	67	-25	-41	-71	-58	-50	-57	-52
Basel-Landschaft	153	-14	-9	-60	-61	-59	-60	-53
Basel-Stadt	32	-17	-38	-72	-75	-67	-61	-68
Berne	158	-30	-33	-66	-60	-57	-55	-46
Fribourg	6	-61	-23	-63	-56	-61	-52	-44
Geneva	111	7	-45	-69	-61	-58	-65	-55
Schwyz	11	-24	-13	-55	-70	-46	-50	-41
Solothurn	16	-13	-41	-62	-65	-53	-49	-56
Vaud	237	-9	-23	-65	-71	-67	-65	-61
Zurich	569	-16	-25	-60	-58	-56	-52	-52

## Trip duration by transport mode and gender

Table 3: Median trip duration by gender and mode (minutes)

Mode	Gender	Baseline-2019	Mar-02	Mar-09	Mar-16	Mar-23	Mar-30	Apr-06	Apr-13
Bicycle	Female	15	15	16	13	19	27	31	38
	Male	14	14	15	25	24	28	36	32
Car	Female	52	41	38	36	36	36	37	35
	Male	51	47	42	34	34	35	35	35
Local PT	Female	14	9	9	5	6	7	5	6
	Male	15	11	12	9	8	8	8	7
Train	Female	36	31	35	19	28	28	16	19
	Male	35	25	33	12	26	23	18	25
Walk	Female	17	22	21	19	18	21	21	21
	Male	17	20	20	16	18	20	21	21

## Average trip length by transport mode (km)



## Activity space and daily travel radius

A commonly used definition of the activity space is the 95% confidence ellipse of the activity locations, in this case weighted by duration. In the following analysis, the activities at the home location are included, for those that had the app activated on that day. This is an important metric which gives an idea of the area in which travel is being performed. The daily travel radius is also presented.

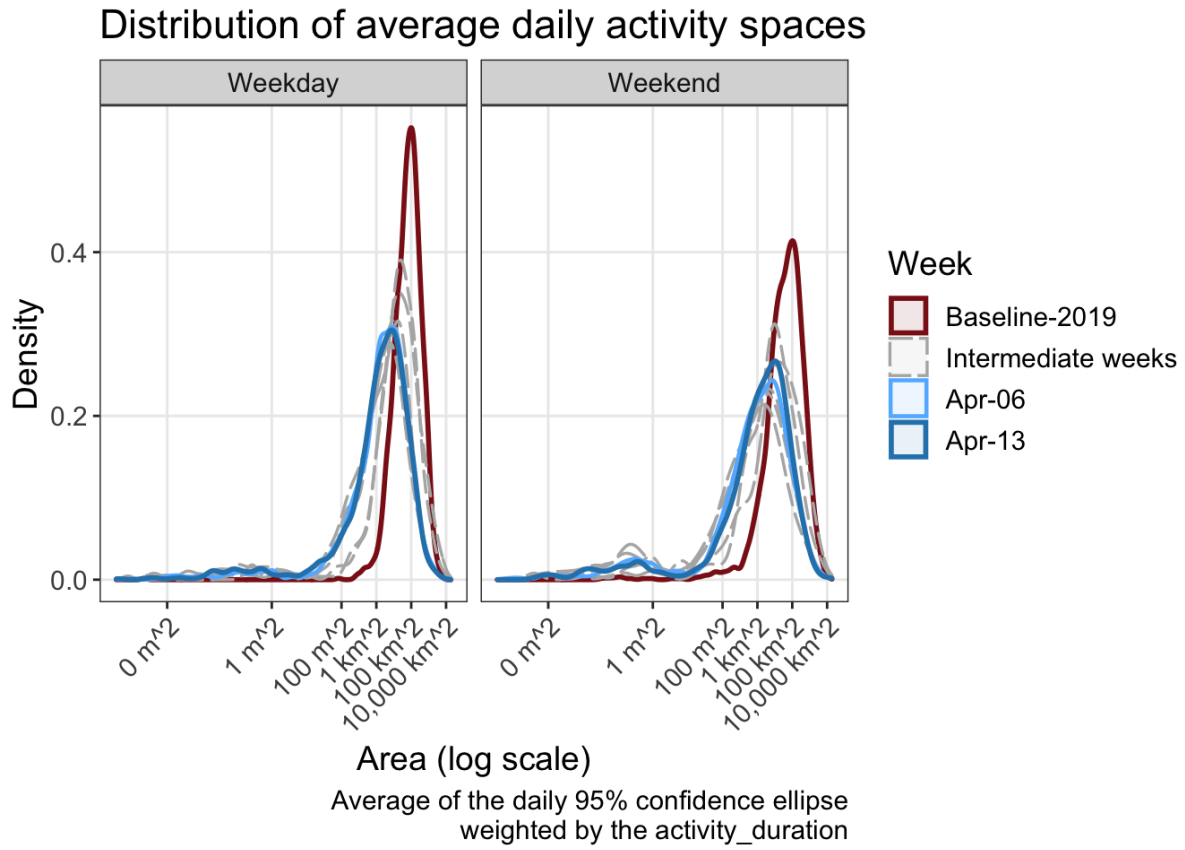


Table 4: Change in average activity space area and average daily radius (%)

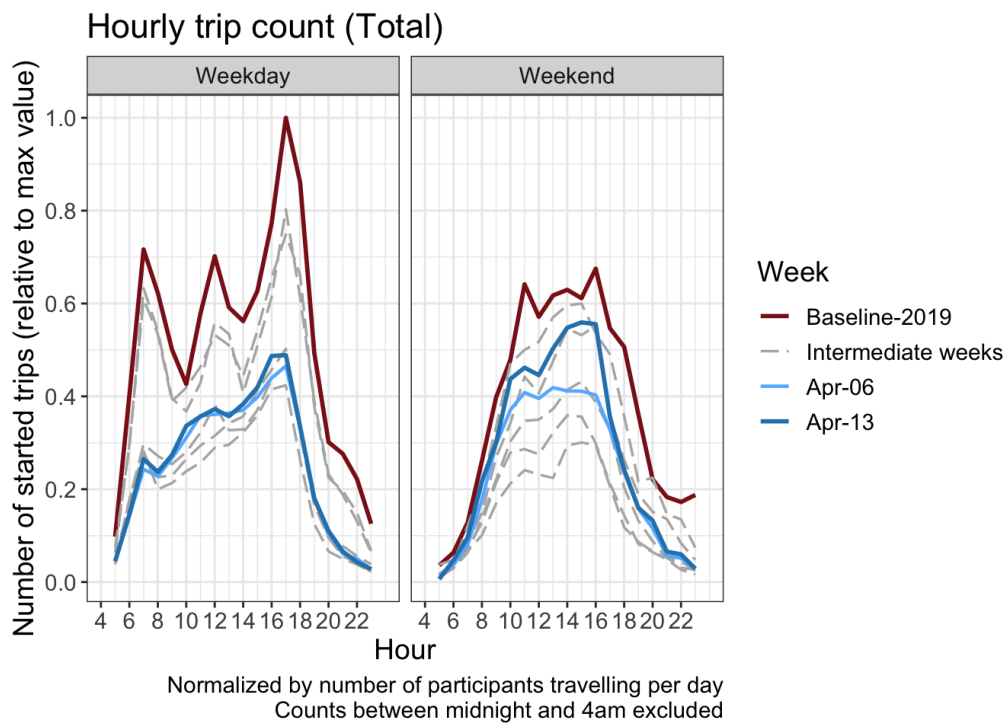
Week		# Activities/day	Change	Area (km <sup>2</sup> )	Change	Daily Radius (km)	Change
<b>Baseline-2019</b>	Weekday	4.74		199.94		10.07	
	Weekend	3.92		224.87		9.89	
<b>Mar-02</b>	Weekday	3.98	-16%	188.70	-6%	8.70	-14%
	Weekend	3.46	-12%	128.24	-43%	8.06	-18%
<b>Mar-09</b>	Weekday	3.98	-16%	120.04	-40%	7.39	-27%
	Weekend	3.19	-19%	81.71	-64%	5.89	-40%
<b>Mar-16</b>	Weekday	2.87	-39%	31.41	-84%	3.97	-61%
	Weekend	2.02	-49%	16.78	-93%	2.29	-77%
<b>Mar-23</b>	Weekday	2.67	-44%	34.63	-83%	3.61	-64%
	Weekend	2.23	-43%	31.25	-86%	3.18	-68%
<b>Mar-30</b>	Weekday	2.88	-39%	41.32	-79%	3.85	-62%
	Weekend	2.55	-35%	33.42	-85%	3.70	-63%
<b>Apr-06</b>	Weekday	2.96	-38%	37.56	-81%	4.13	-59%
	Weekend	2.79	-29%	42.13	-81%	3.82	-61%
<b>Apr-13</b>	Weekday	3.00	-37%	39.91	-80%	4.29	-57%
	Weekend	2.77	-29%	40.02	-82%	3.65	-63%

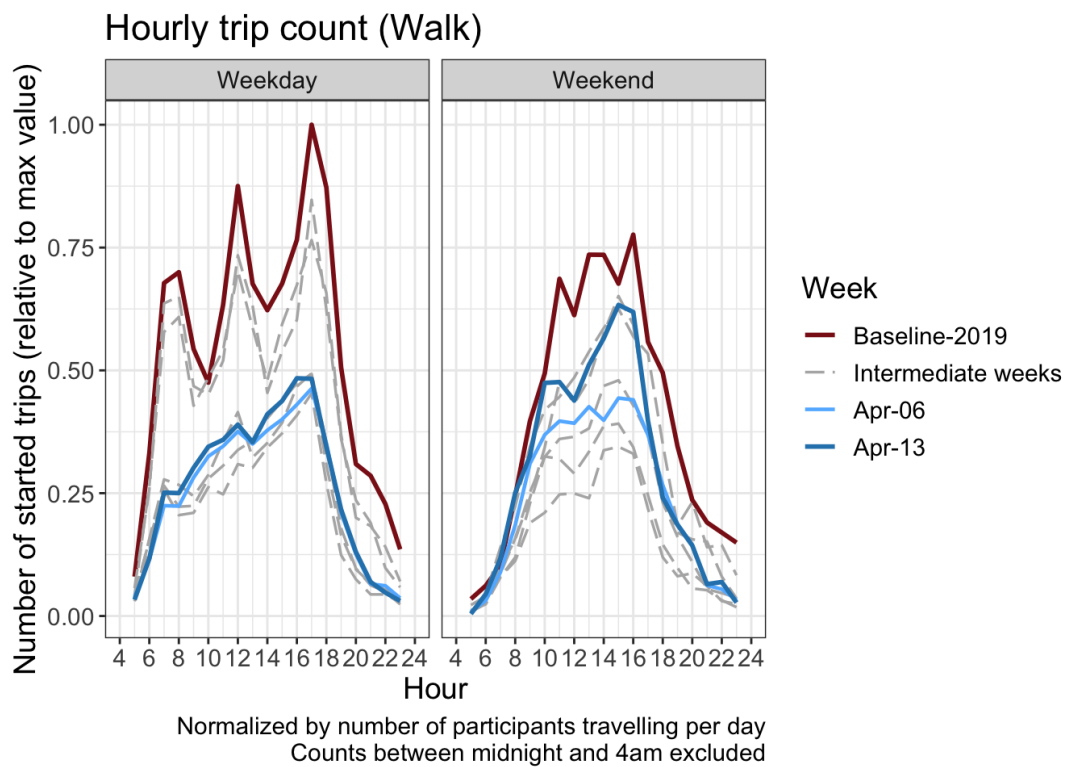
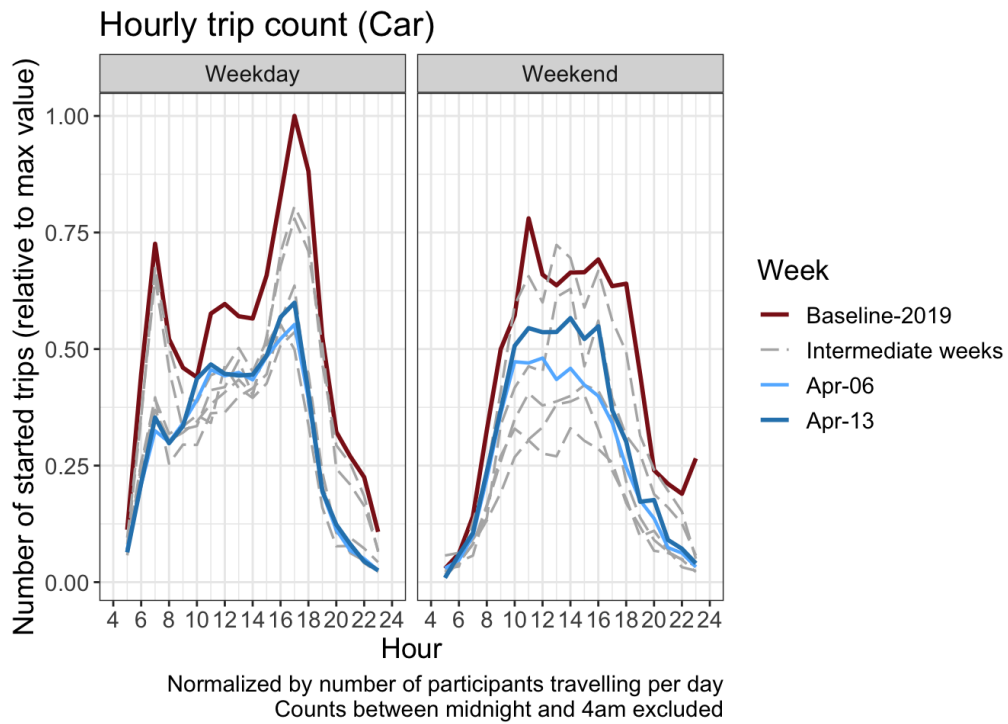
Table 5: Change in median weekly activity space by type of day and age class (km<sup>2</sup>)

Age		2019	Mar-02	Mar-09	Mar-16	Mar-23	Mar-30	Apr-06	Apr-13
(18,25]	Weekday	65.1	35.9	48.1	6.6	2.6	3.2	5.8	7.9
	Weekend	35.7	5.8	9.8	0.6	0.9	0.8	1.2	2.8
(25,35]	Weekday	71.3	85.2	42.6	2.3	4.9	4.6	7.7	6.3
	Weekend	42.6	14.5	3.3	0.4	0.6	1.4	2.3	4.6
(35,45]	Weekday	74.9	36.4	75.0	6.8	3.3	7.6	8.2	9.2
	Weekend	24.9	29.9	20.5	0.4	1.6	0.8	1.4	4.7
(45,55]	Weekday	74.5	40.5	53.8	4.0	3.1	4.7	7.0	4.8
	Weekend	28.2	13.3	7.0	0.7	1.2	1.6	1.6	5.8
(55,65]	Weekday	67.2	64.0	46.4	7.3	2.8	5.8	5.2	7.1
	Weekend	21.5	9.1	8.7	0.1	1.1	1.1	1.2	4.8

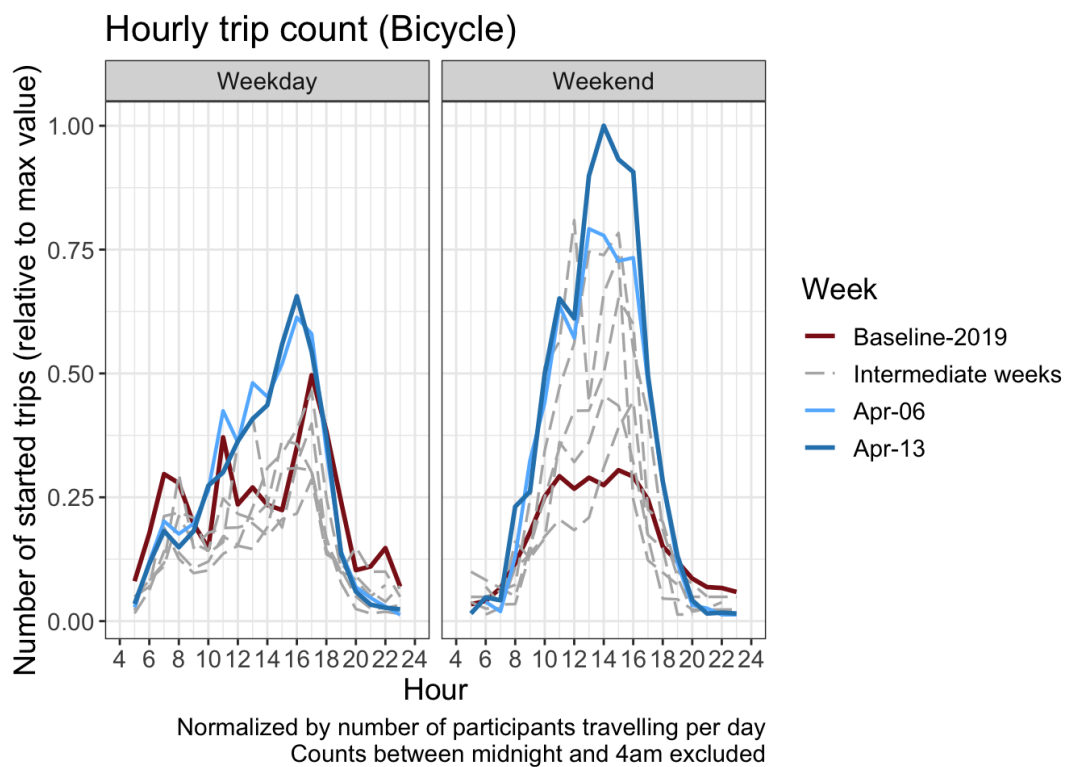
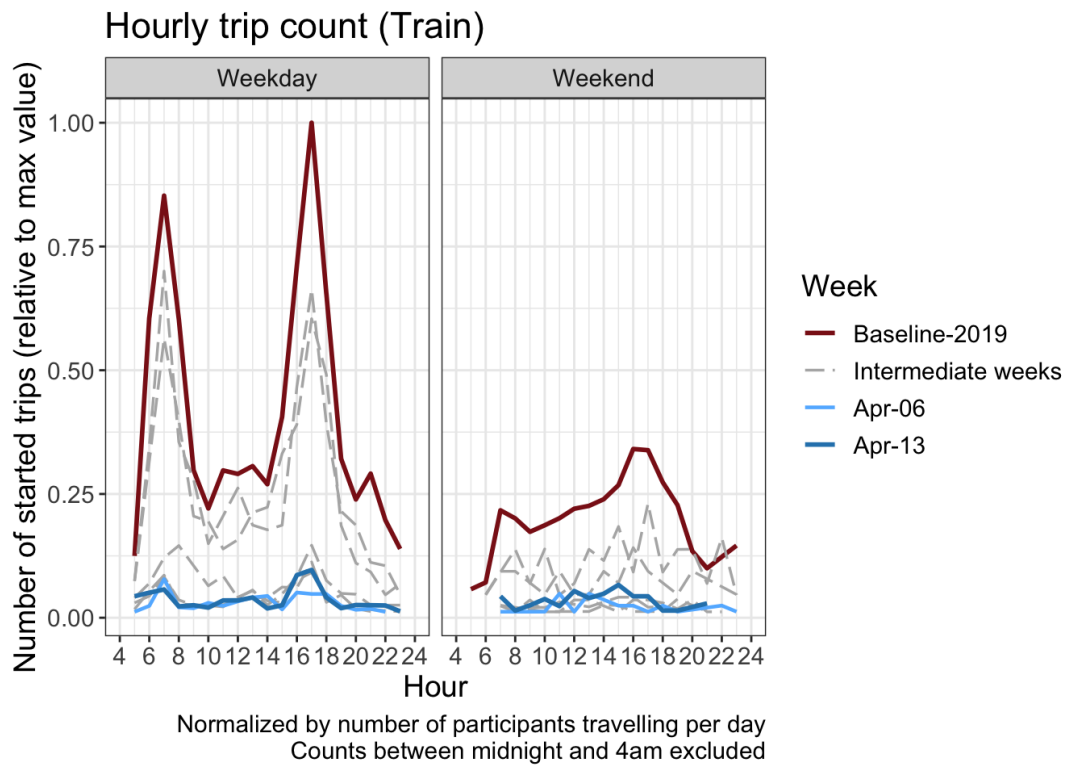
## Hourly counts

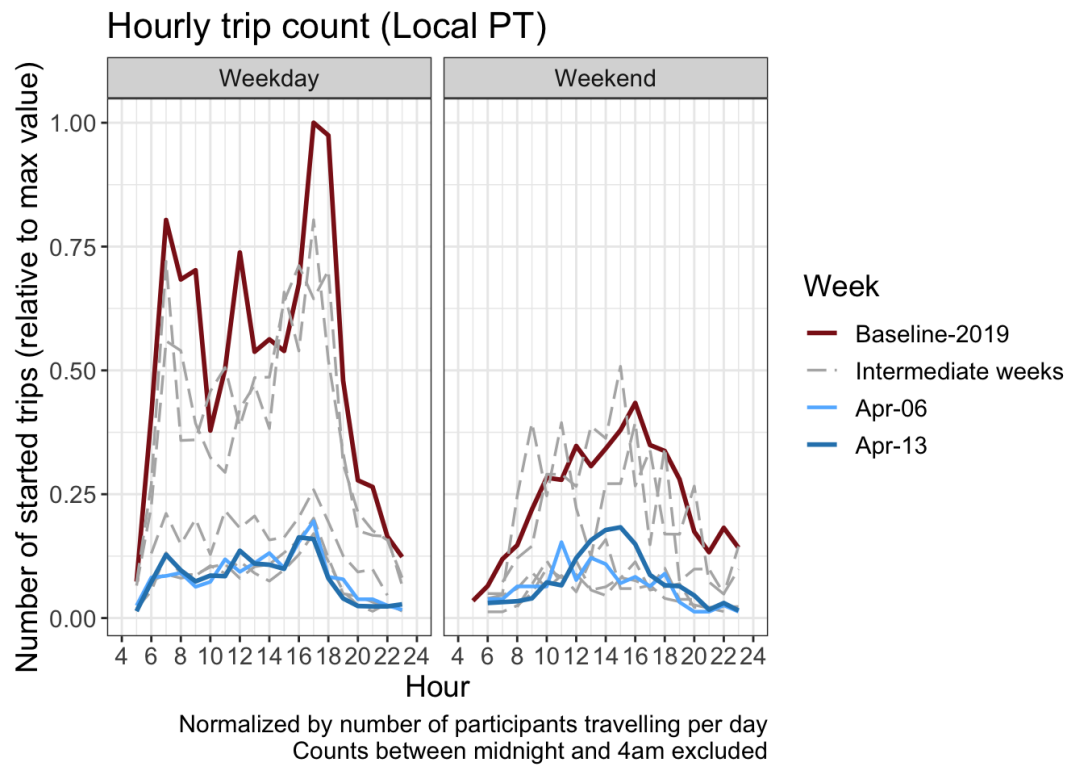
The number of trips started per hour. The y axis is normalized by the maximum hourly value in the graph.











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