TBD*

TBD

TBD

20 February 2021

Abstract

First sentence. Second sentence. Third sentence. Fourth sentence.

1 Data

1.1 Results

Questions pertaining to the characteristics of the restaurants, such as location, size, type, and age of restaurants (Figures 1-5) show us that:

- the largest concentration (nearly 60%) of restaurants in the Greater Toronto Area are centralized in downtown Toronto (28.26%), North York (15.78%), and Scarborough (13.74%);
- most restaurants are of medium or larger scale, with seating areas of at least 30;
- a majority of the restaurants are relatively new (1-4 years old);
- fast-food/quick service restaurants are most common, followed by casual dining, and then fine dining;
- and UberEats is the most popular food courier service in the city.

Tables 1 and 2 speak to changes in numbers of employees for restaurants prior to the intervention period (Oct 1) and following the intervention period (Dec 31). This shows us that initially, both the control and treatment group had a very similar number of employees on average. Following the intervention period, however, the treatment group appears to have 10.26 fewer employees on average. Two-tailed Welch's t-tests comparing the two groups' mean employees shows that the difference prior to the intervention period is not a significant finding ($t(330) = -8.56$, $p > .05$)., but the difference in employee numbers between the two groups post-intervention is significant($t(330) = 19.46$, $p < .05$).

In terms of effects on revenue and/or overall sales for restaurants during the intervention period, Figure 5 shows us that more restaurants within the treatment group saw decreases in revenue compared to the prior quarter (July 1 - Sep 30), while the control group's revenue largely remained the same. In addition to this, Figure 6 shows that of those restaurants that saw a decrease in revenue, the treatment group saw the harshest declines in revenue during the intervention period. A Chi-Square test for whether the restaurant saw a decrease in revenue showed that restaurants in the treatment group were more likely to report a decrease in revenue X^2 (2, $N = 330$) = 220.73, $p < 2.2e\text{-}16$. The percentage decrease in revenues also showed a significant relationship, where restaurants in the treatment group are most likely to report higher loss of revenue during the intervention period X^2 (3, $N = 330$) = 178.33, $p < 2.2e\text{-}16$. Prior to the intervention period, it appears as though both groups had similar breakdowns of revenue coming from take-out and/or delivery (Figure 7).

---

*Code and data are available at: LINK.

Questions related to the adjustments of the restaurants during the intervention, such as a menu price, and hours and days of operation (Figures 8-12) show us that:
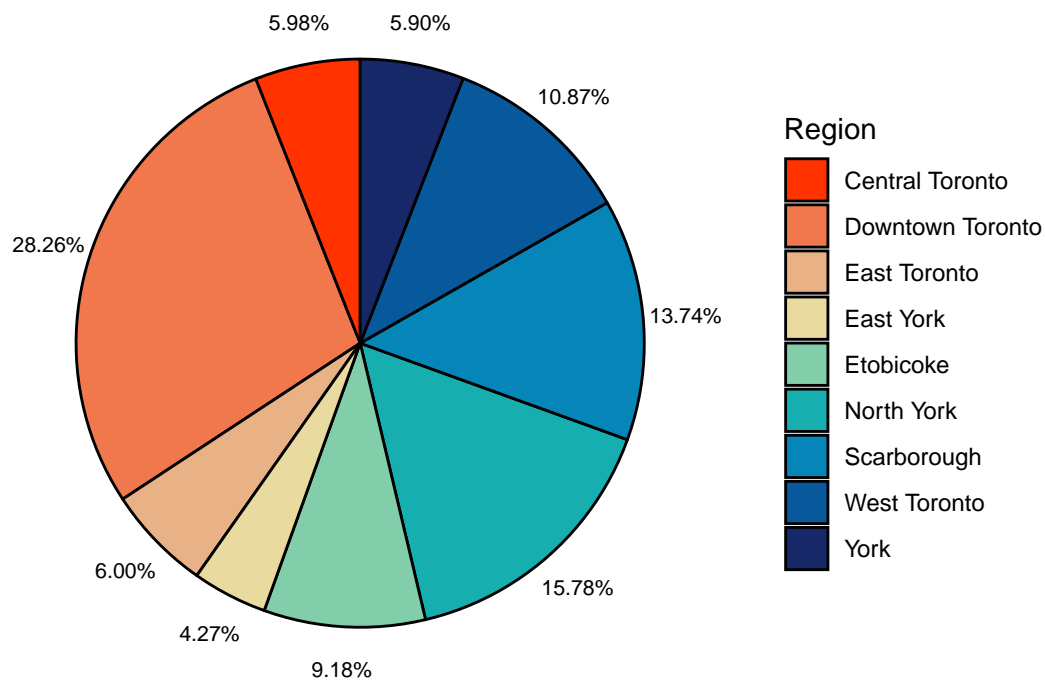
- most of the restaurants in the control group did not change the menu price, while most of the ones in the treatment group either lowered or raised the menu price;
- and most of the restaurants in the control group did not adjust their hours and days of operation, while most of the ones in the intervention group reduced their operating schedule.

Pearson's Chi-squared test is used to see if there is a statistically significant difference between the intervention and the adjustments of the restaurants. The test results show that the p-value of each of those adjustments is close to 0 ($p < 2.2e\text{-}16$), meaning that there is a high correlation between those two variables. Consequently, it is expected that restaurants will adjust the menu price and reduce their operating schedule if they operate on a delivery and take-out only basis.
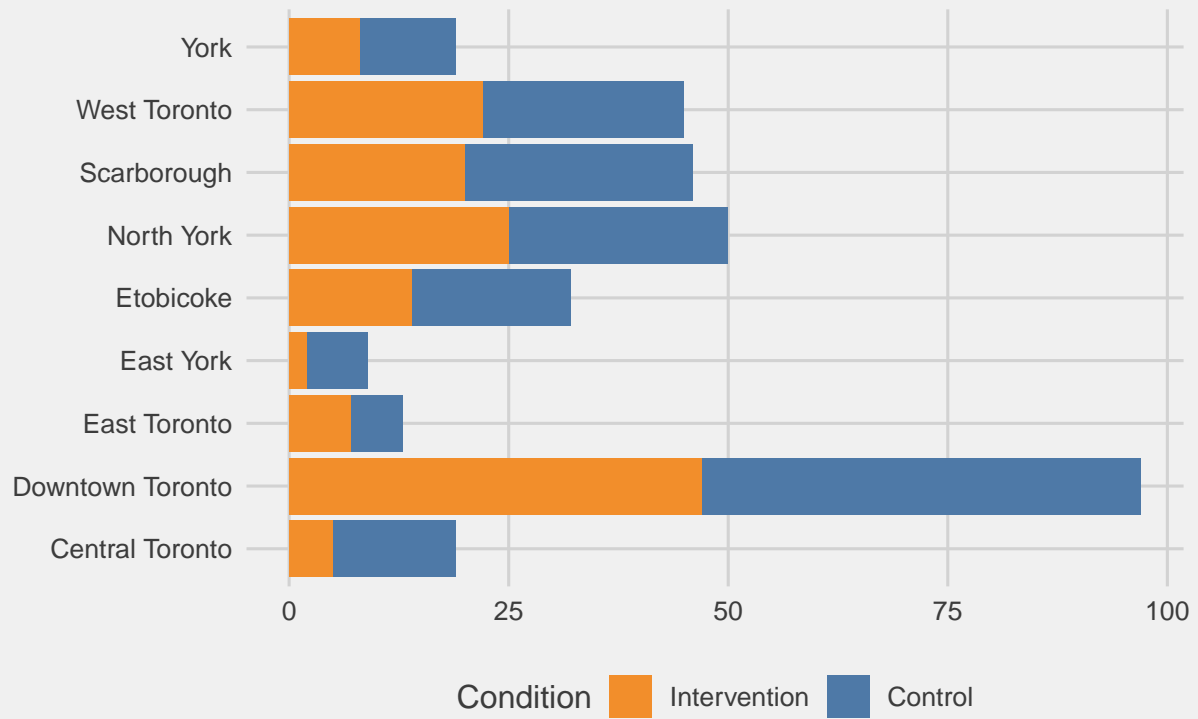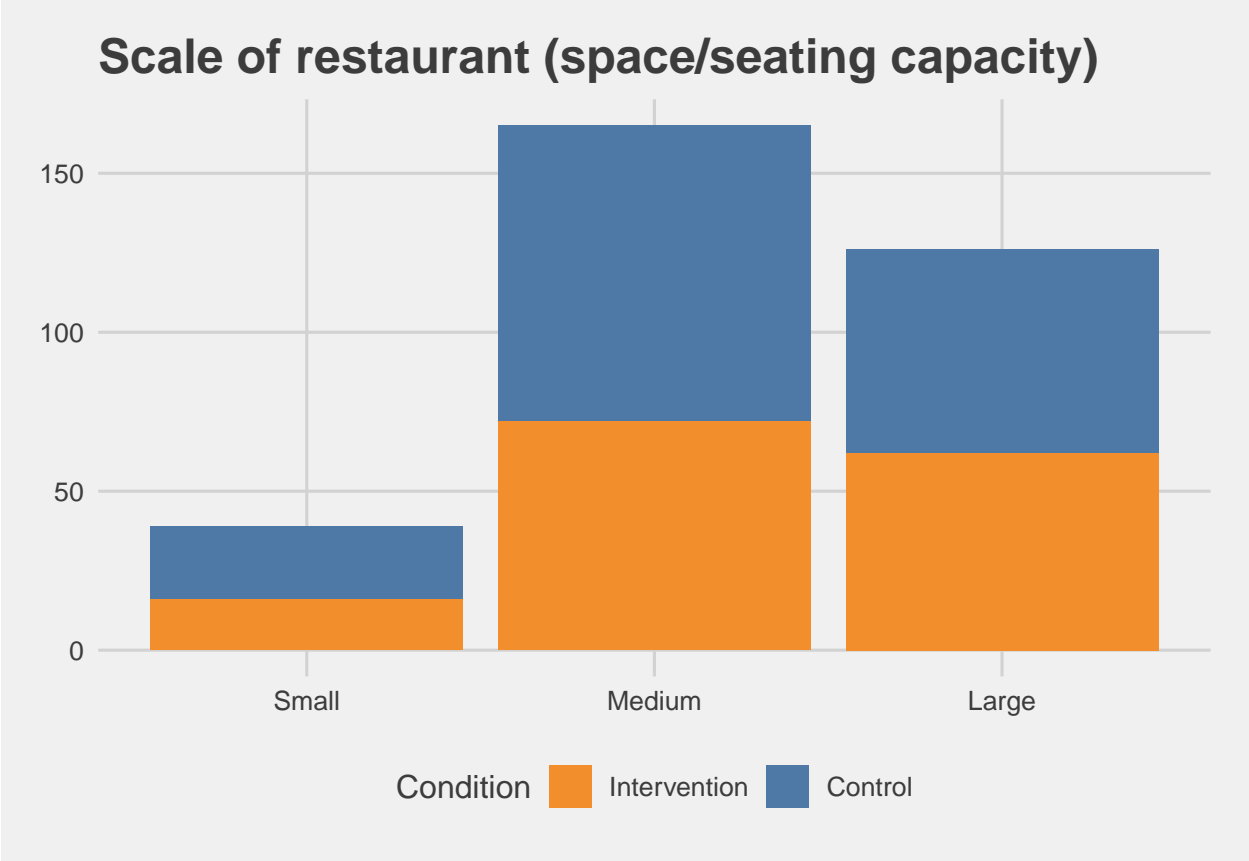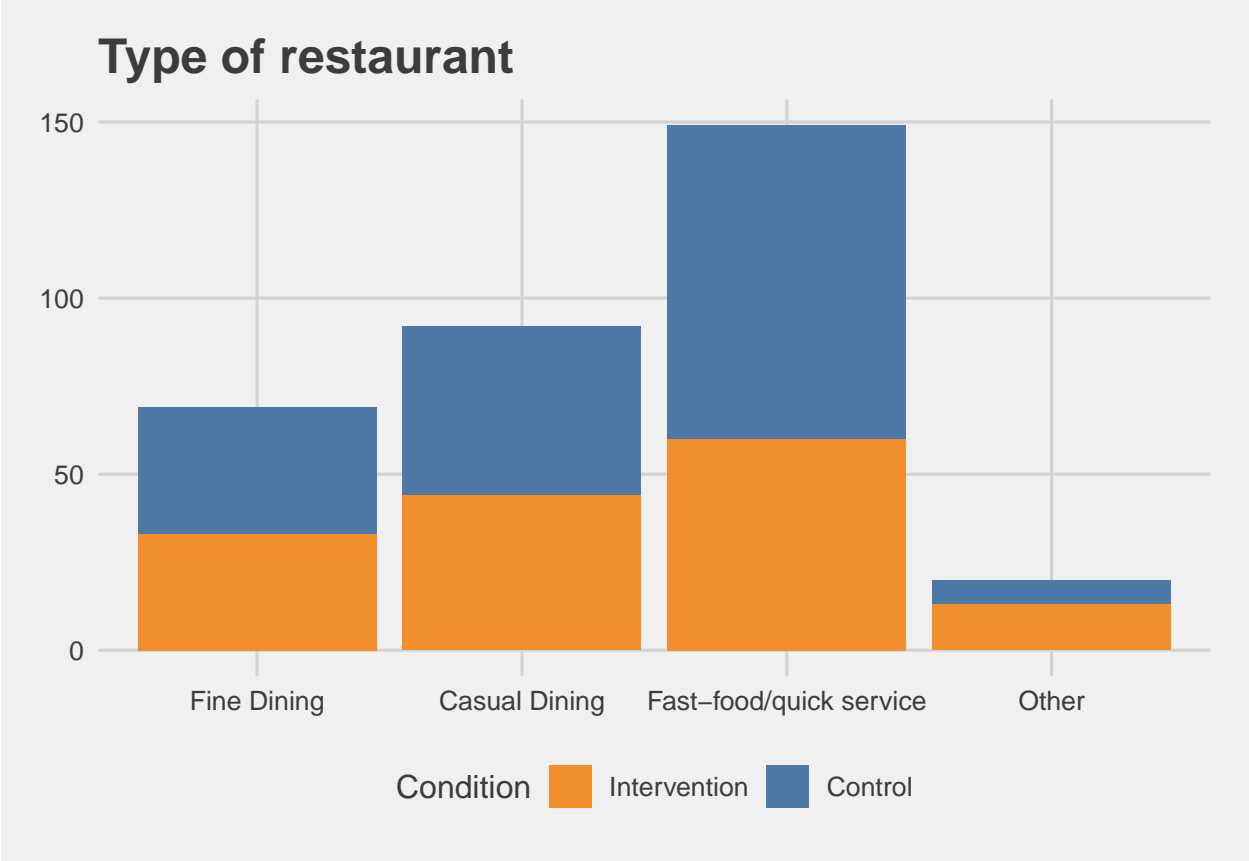
1.2 Figures

1.2.1 Sample Characteristics

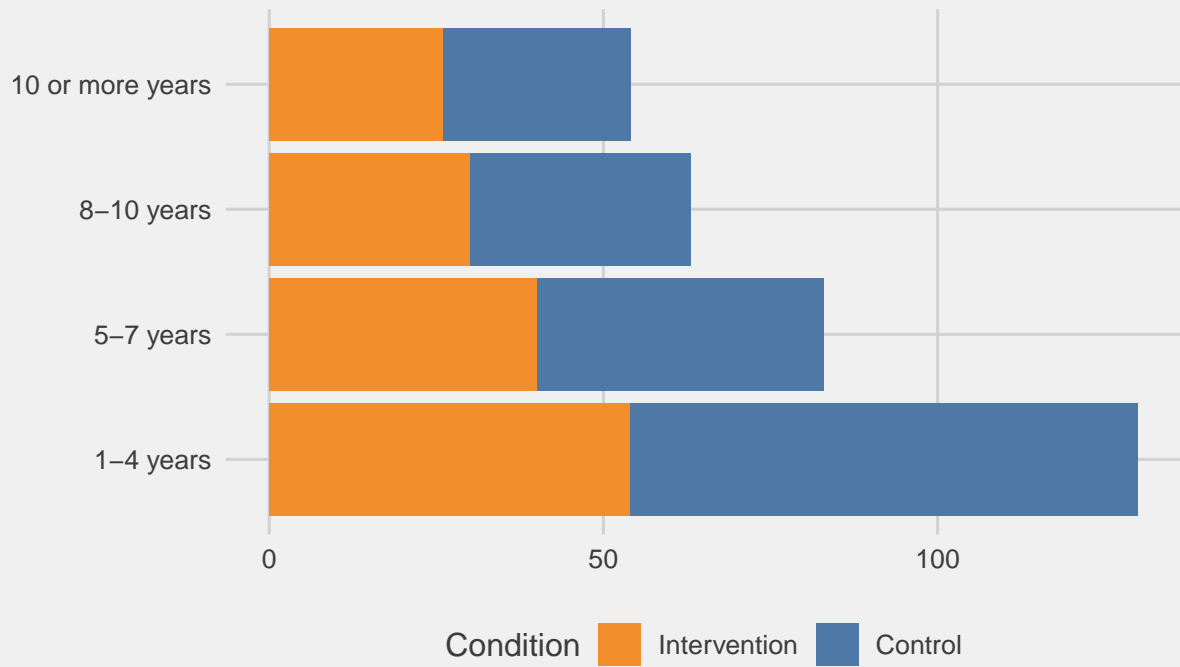**Proportion of Restaurants in Toronto by Borough**

Location of restaurants

Scale of restaurant (space/seating capacity)

Condition: Intervention, Control

Type of restaurant

Condition: Intervention, Control

Number of years restaurants have been in operation

Condition: Intervention, Control

Food courier service popularity (most c

Condition: Intervention, Control
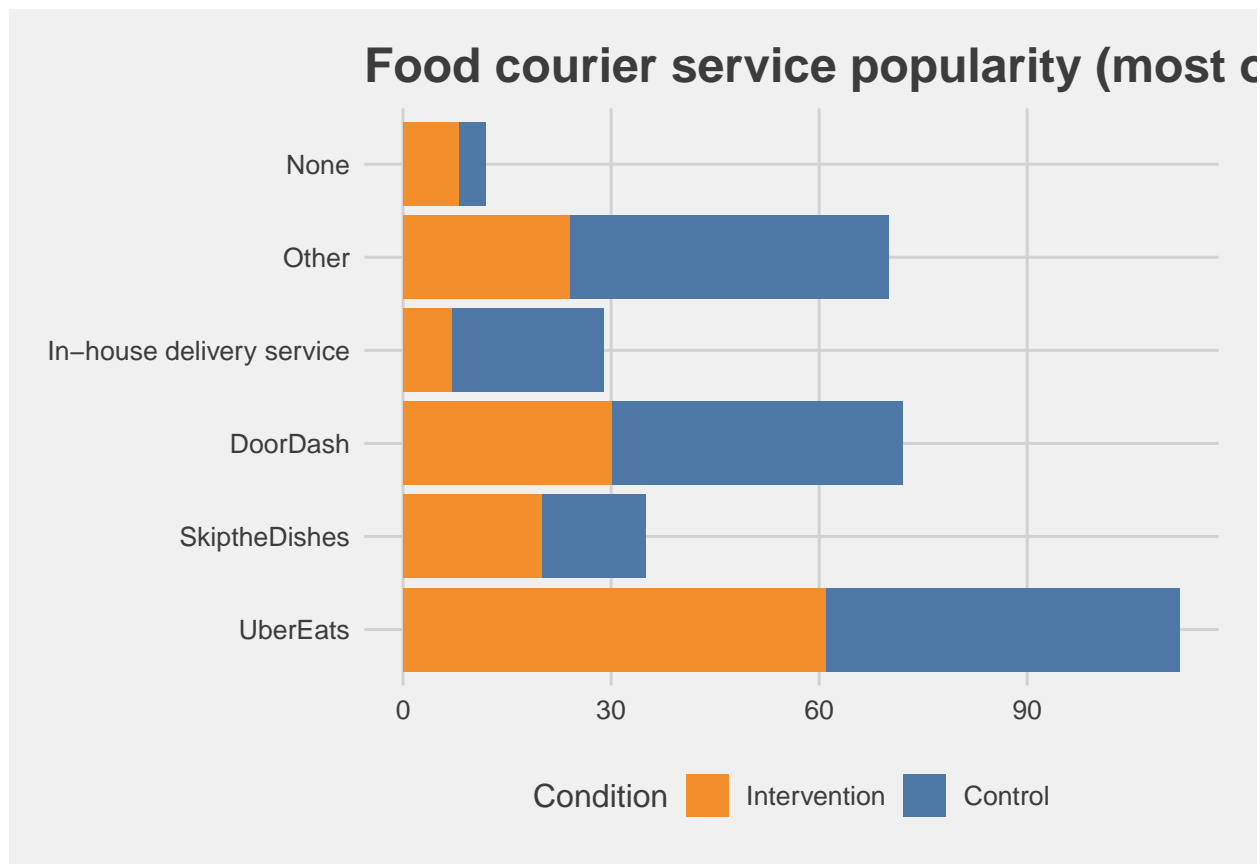
1.2.2 Effects of Intervention on Number of Employees

Intervention Group	# of Employees Prior to Intervention	Current # of Employees
Control	30.76111	29.27222
Treated	30.33333	19.70000

Note:

Change in # of employees before and after intervention period (Q5 + Q6)

Mean of the Differences	Control	Treated	t	p	df
	Mean (Employees Before Intervention)	Mean (Employees Post-Intervention)			
0.4277778	30.76111	30.33333	0.7537181	0.45158	315.8560
9.5722222	29.27222	19.70000	18.9807476	0.00000	327.1139

∞

Table 1: Pearson's Chi-squared Test for Q7

	X-squared	df	p-value
X-squared	176.87	2	3.90993173596564e-39 *

* The Chi-squared statistic is significant at the 0.05 level
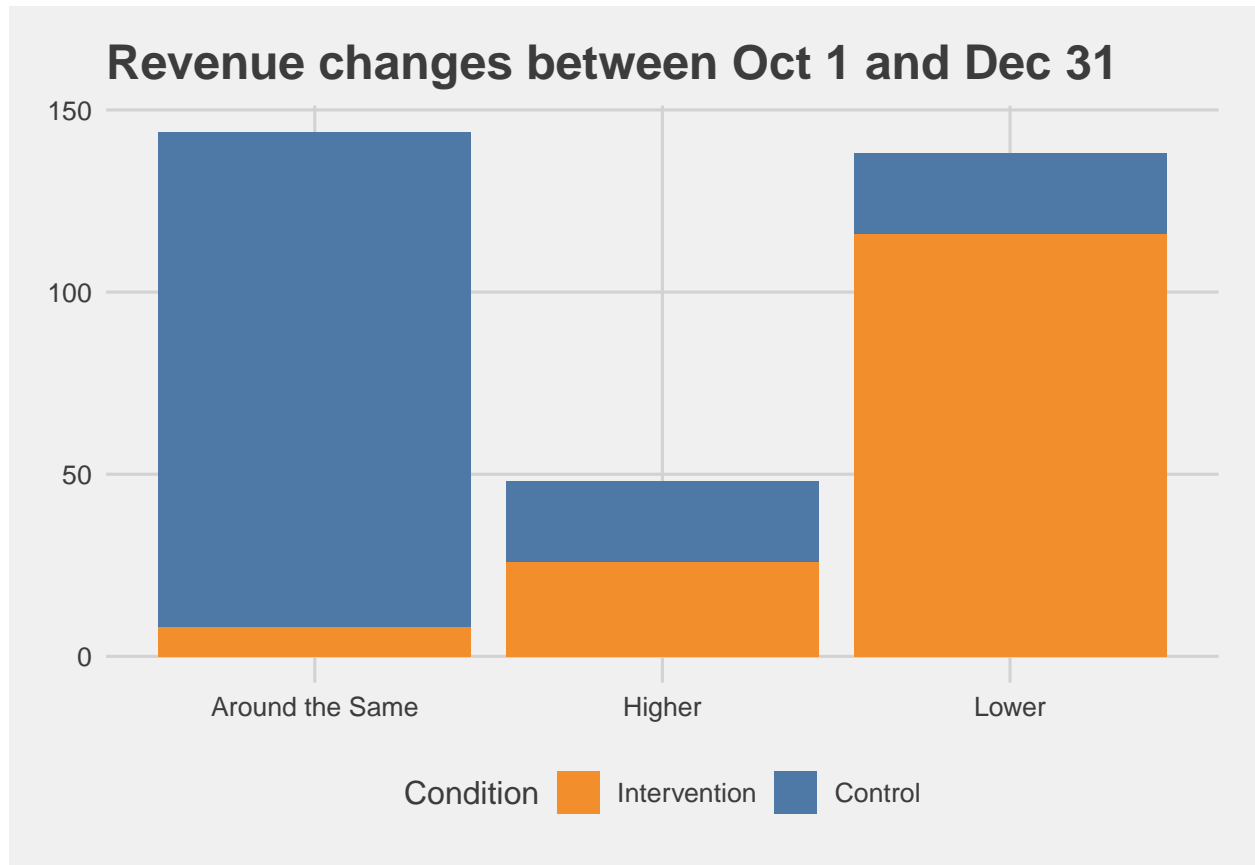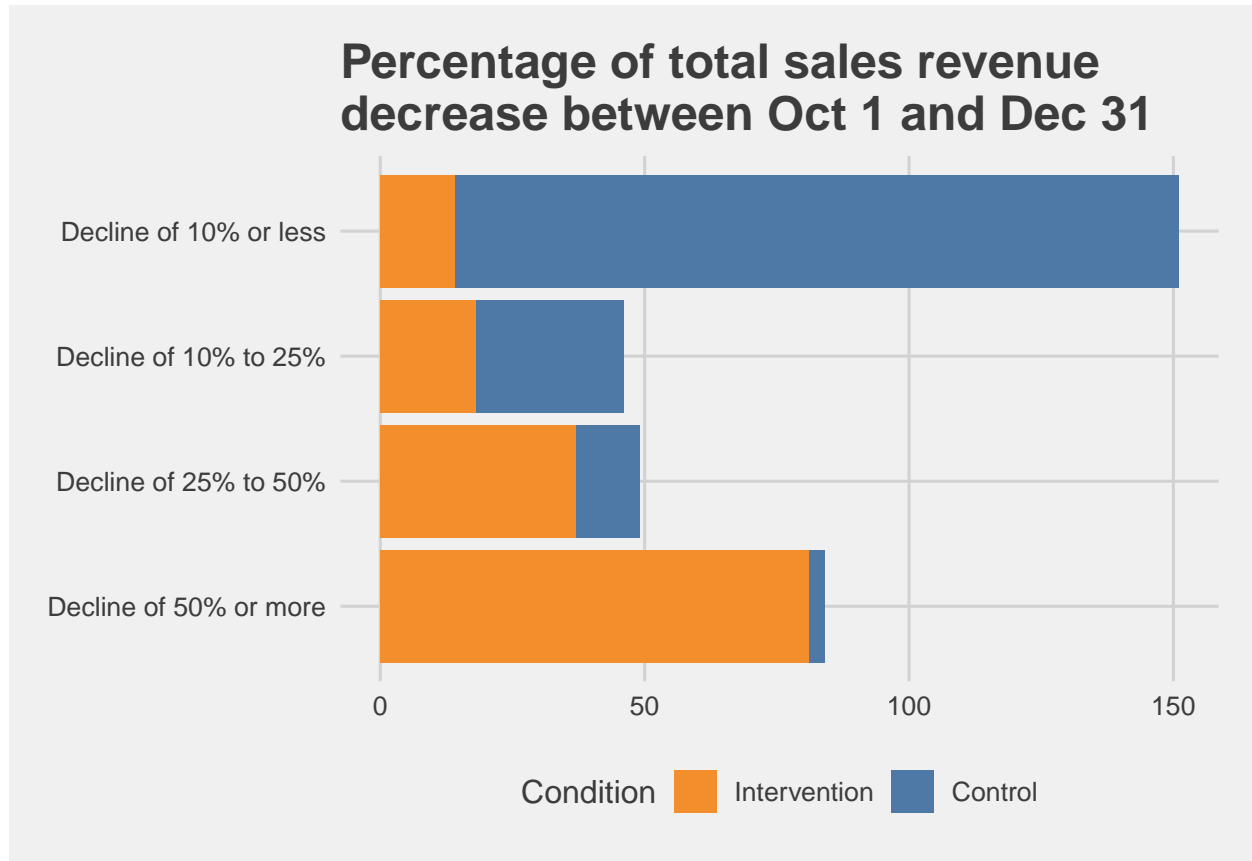
1.2.3 Effects of Intervention on Revenue

Table 2: Pearson's Chi-squared Test for Q8

	X-squared	df	p-value
X-squared	186.36	3	3.72663667927164e-40 *

* The Chi-squared statistic is significant at the 0.05 level

Percentage of total sales revenue decrease between Oct 1 and Dec 31

Total revenue from takeout or delivery prior to Oct 1

Condition — Intervention — Control
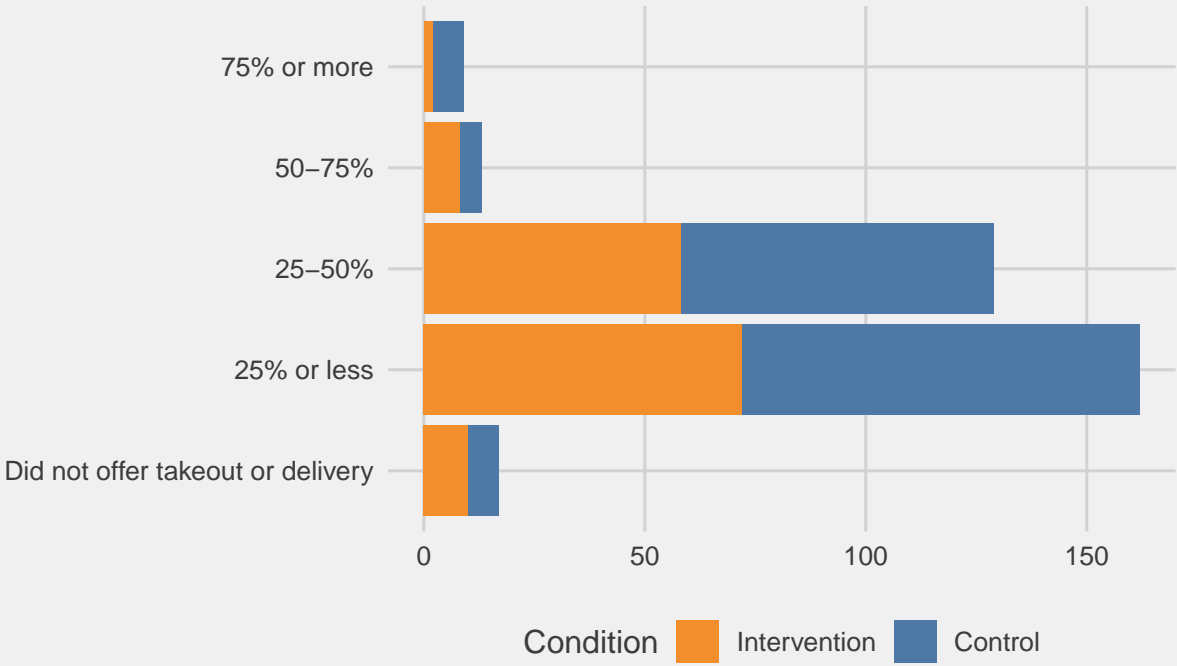
Table 3: Pearson's Chi-squared Test for Q10

	X-squared	df	p-value
X-squared	199.75	2	4.21322604799076e-44 *

* The Chi-squared statistic is significant at the 0.05 level

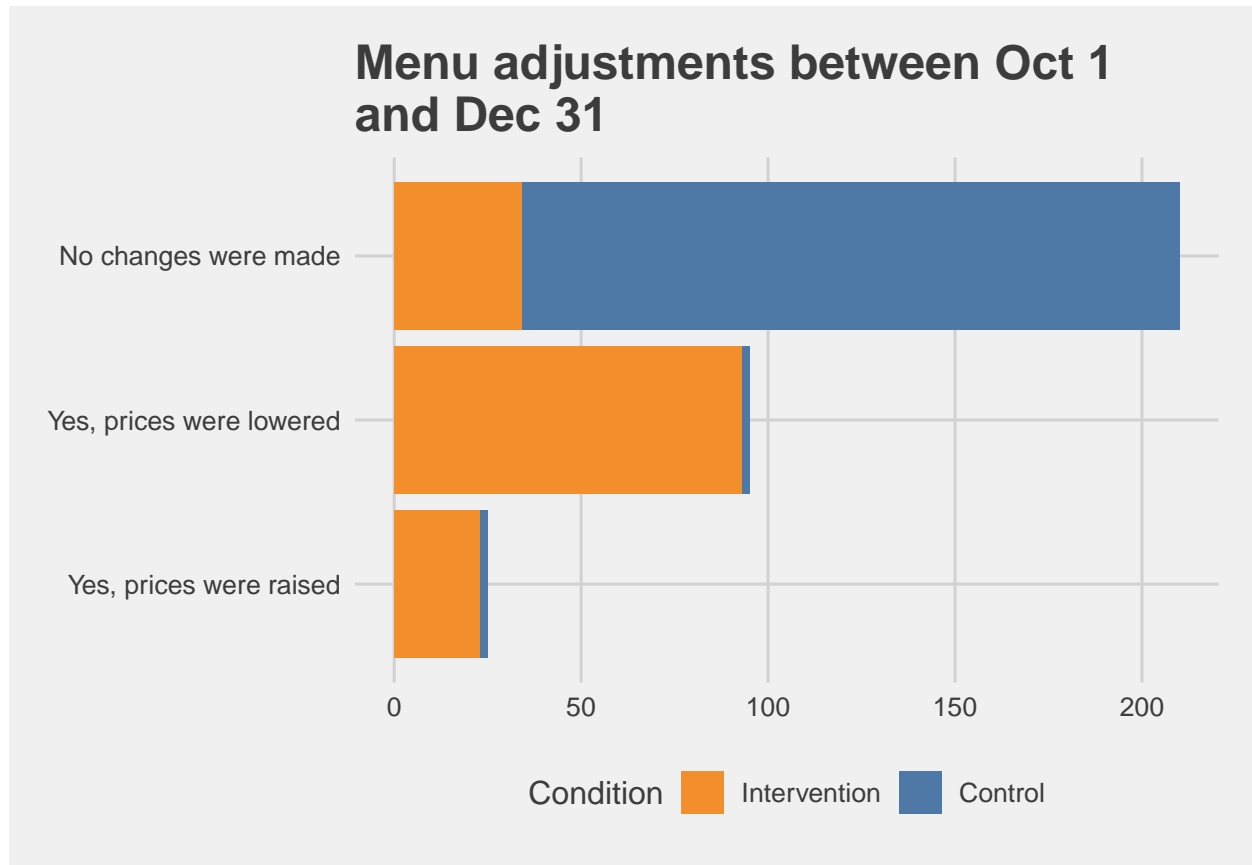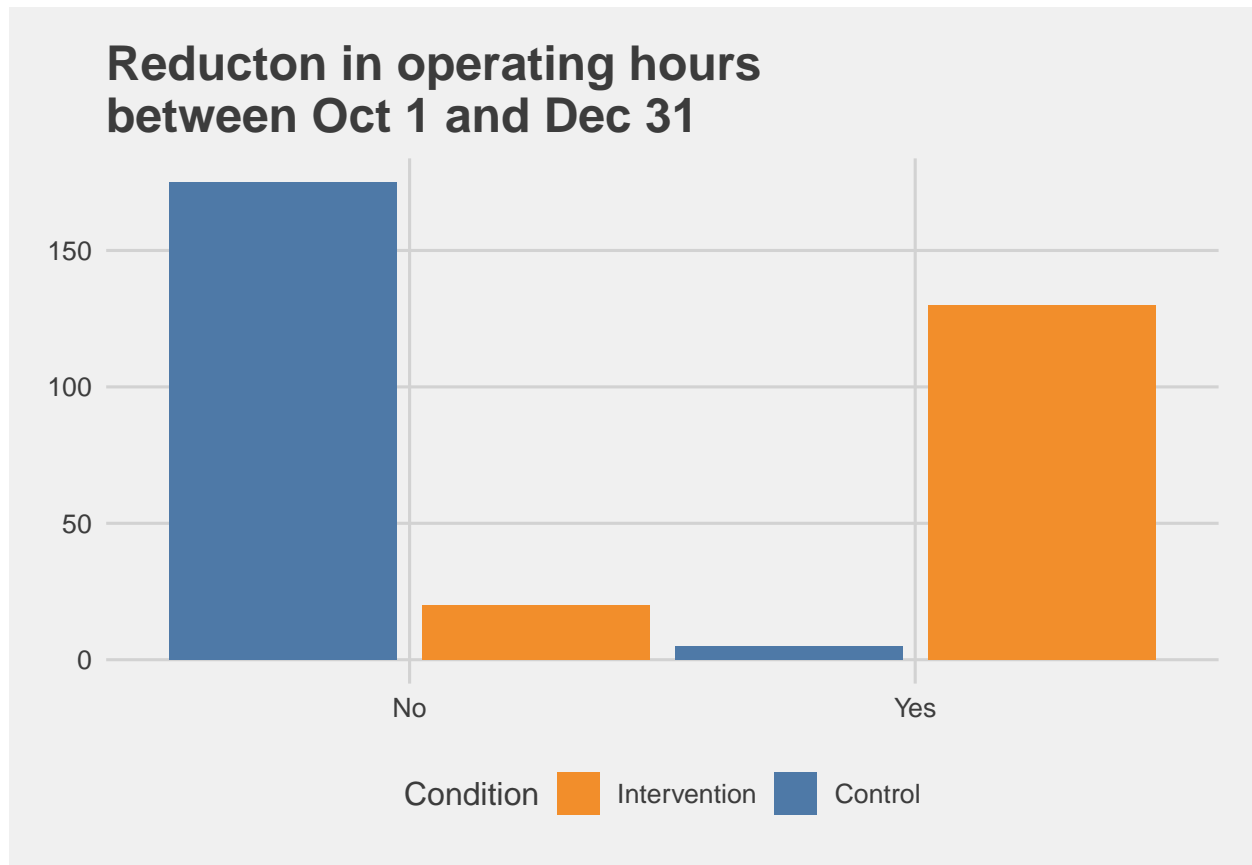## 1.3 Effects of Intervention on Menu Prices

Table 4: Pearson's Chi-squared Test for Q12

	X-squared	df	p-value
X-squared	234.73	1	5.54591387835577e-53 *

* The Chi-squared statistic is significant at the 0.05 level

1.4   Effects of Intervention on Hours/Days of Operation

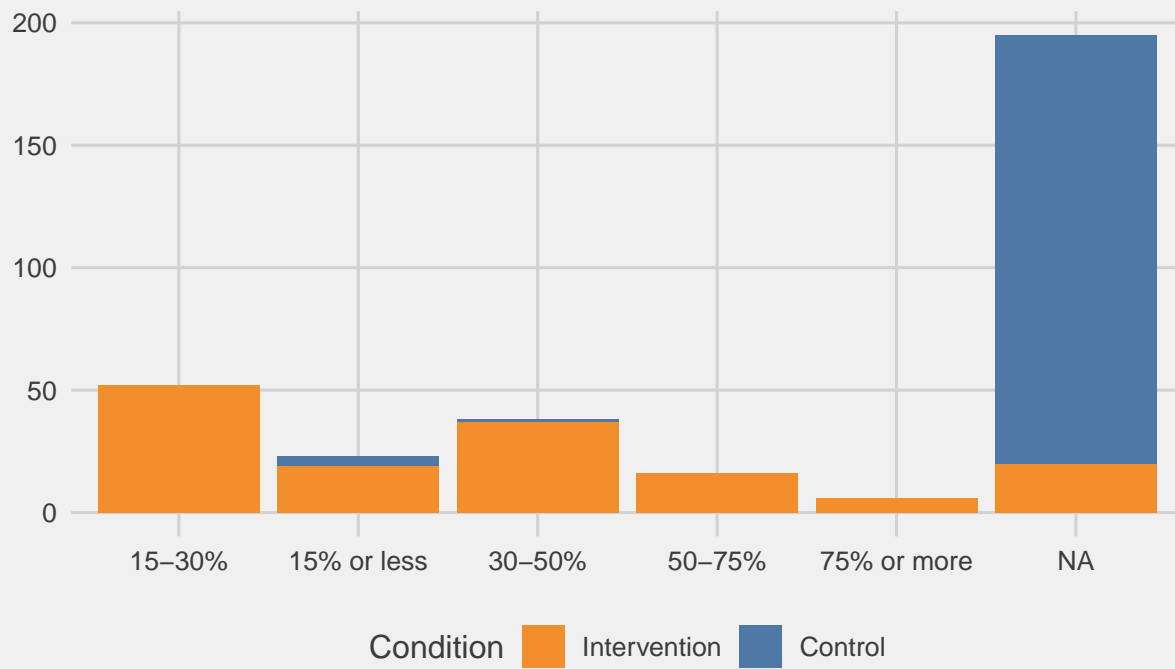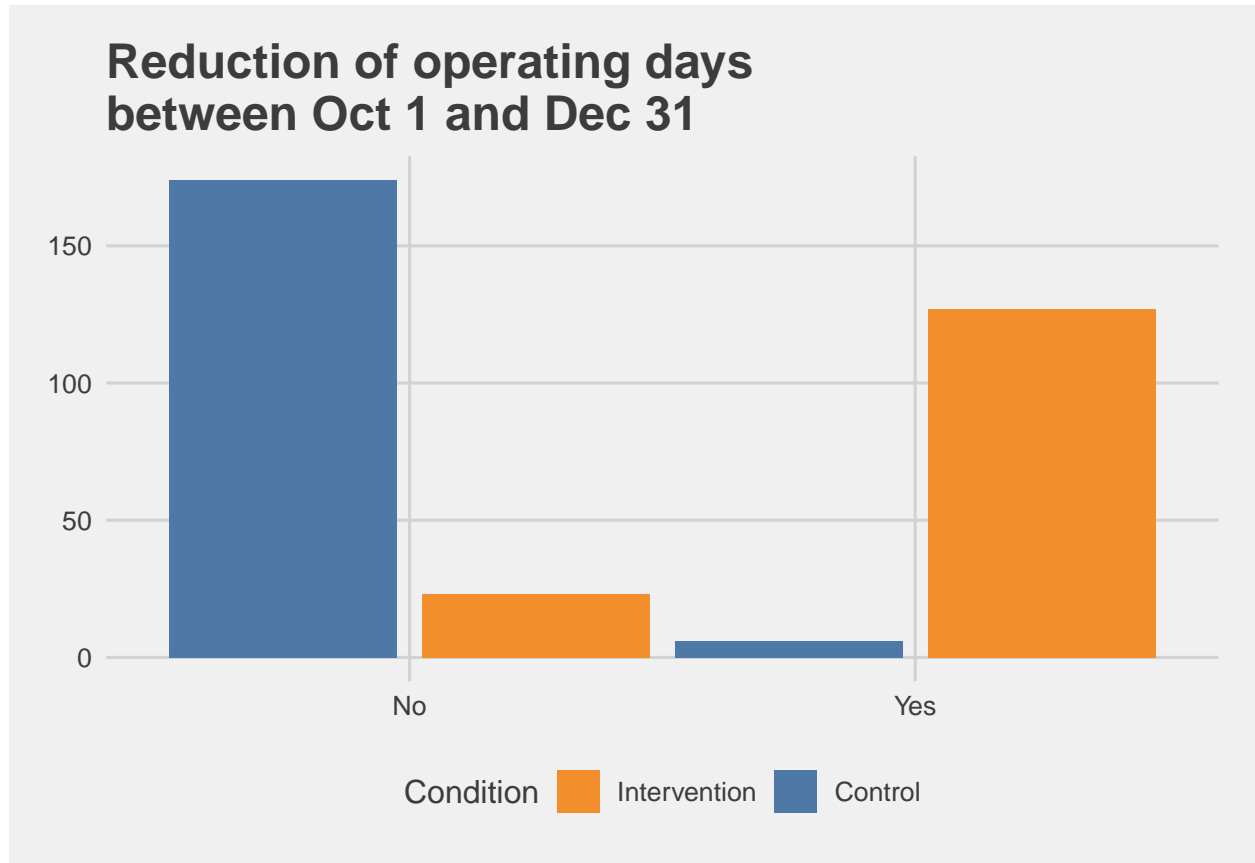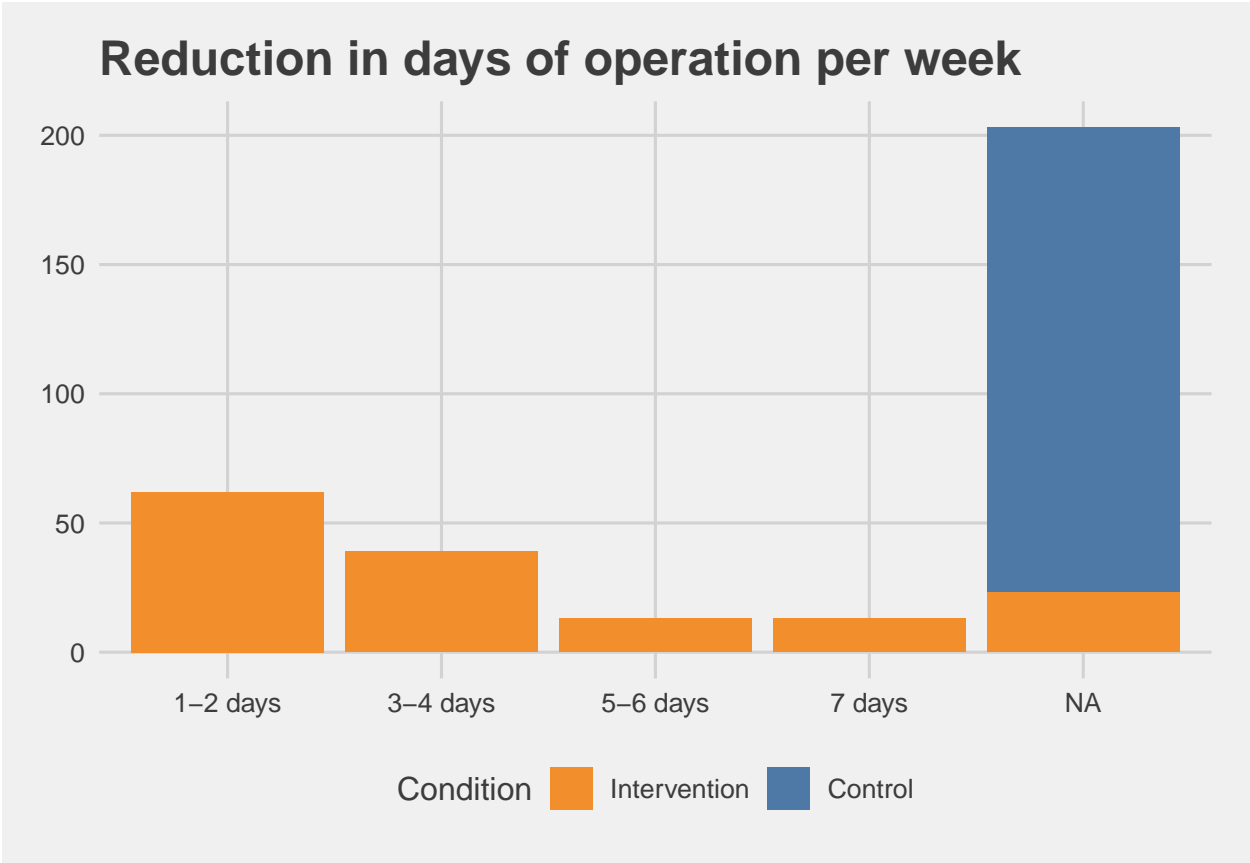**Reducton in operating hours between Oct 1 and Dec 31**

Percentage of hours reduced between Oct 1 and Dec 31

Condition: Intervention, Control

Table 5: Pearson's Chi-squared Test for Q14

	X-squared	df	p-value
X-squared	221.59	1	4.07404786350208e-50 *

* The Chi-squared statistic is significant at the 0.05 level

Reduction of operating days between Oct 1 and Dec 31

Reduction in days of operation per week

Condition: Intervention (orange), Control (blue)

Funding Applications between Oct 1 and Dec 31

Appendix

2   References