

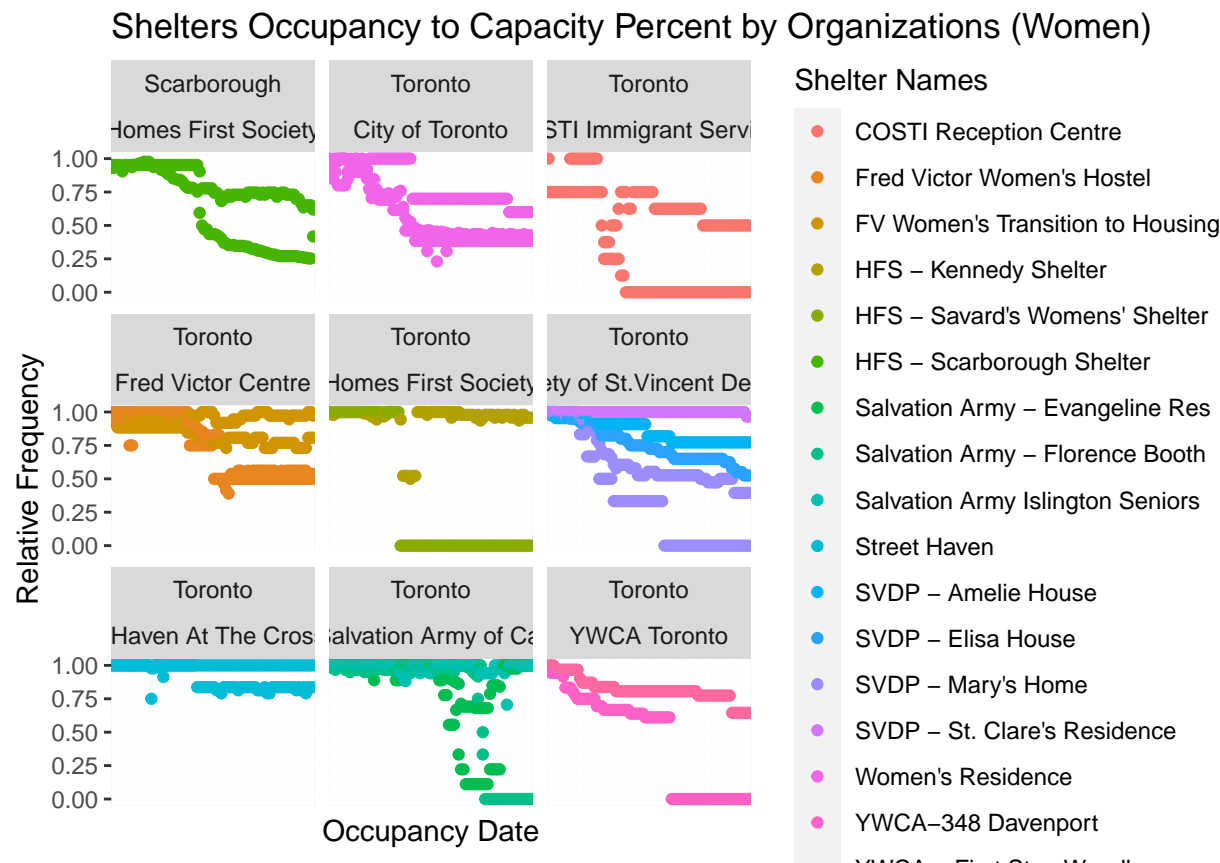
# DataFest 2020 - How Will COVID-19 Affect the Sector Composition and Occupancy in Temporary Shelters?

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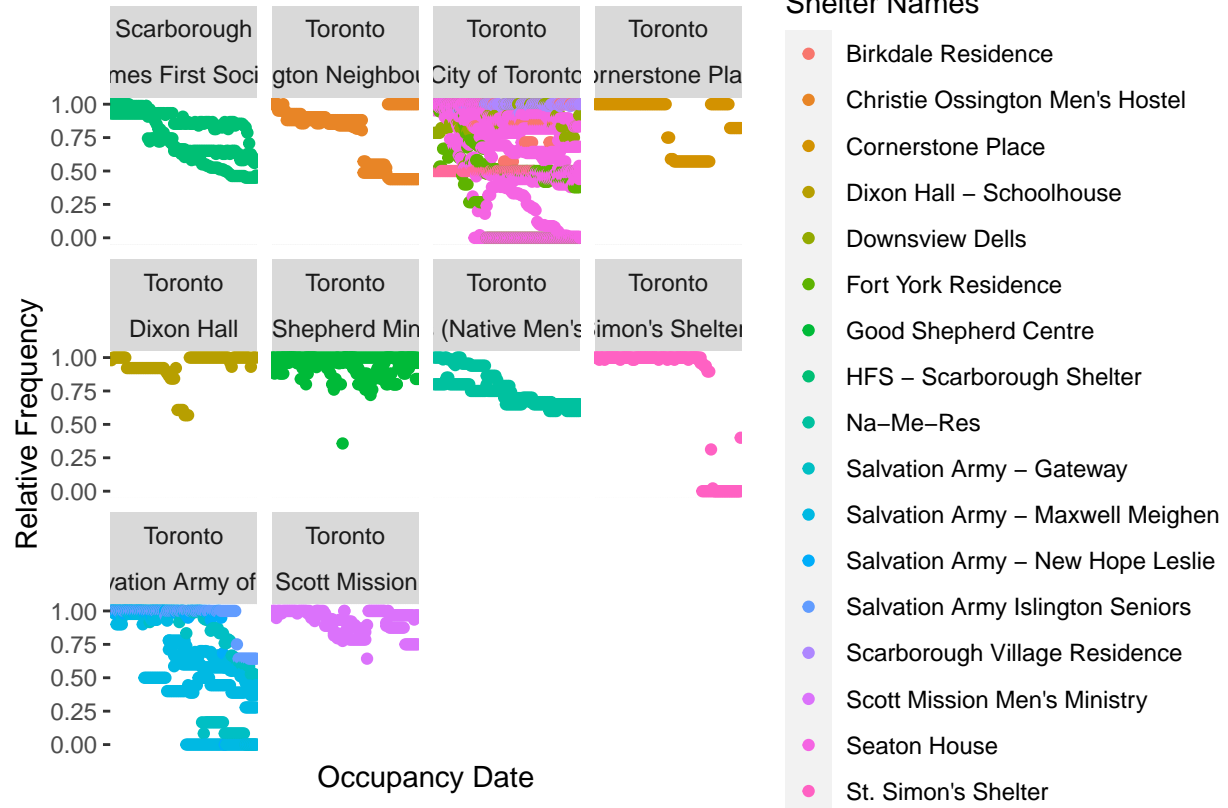
Qs: The effects of covid19 on the sector composition and occupancy count(percent) of temporary shelters around GTA

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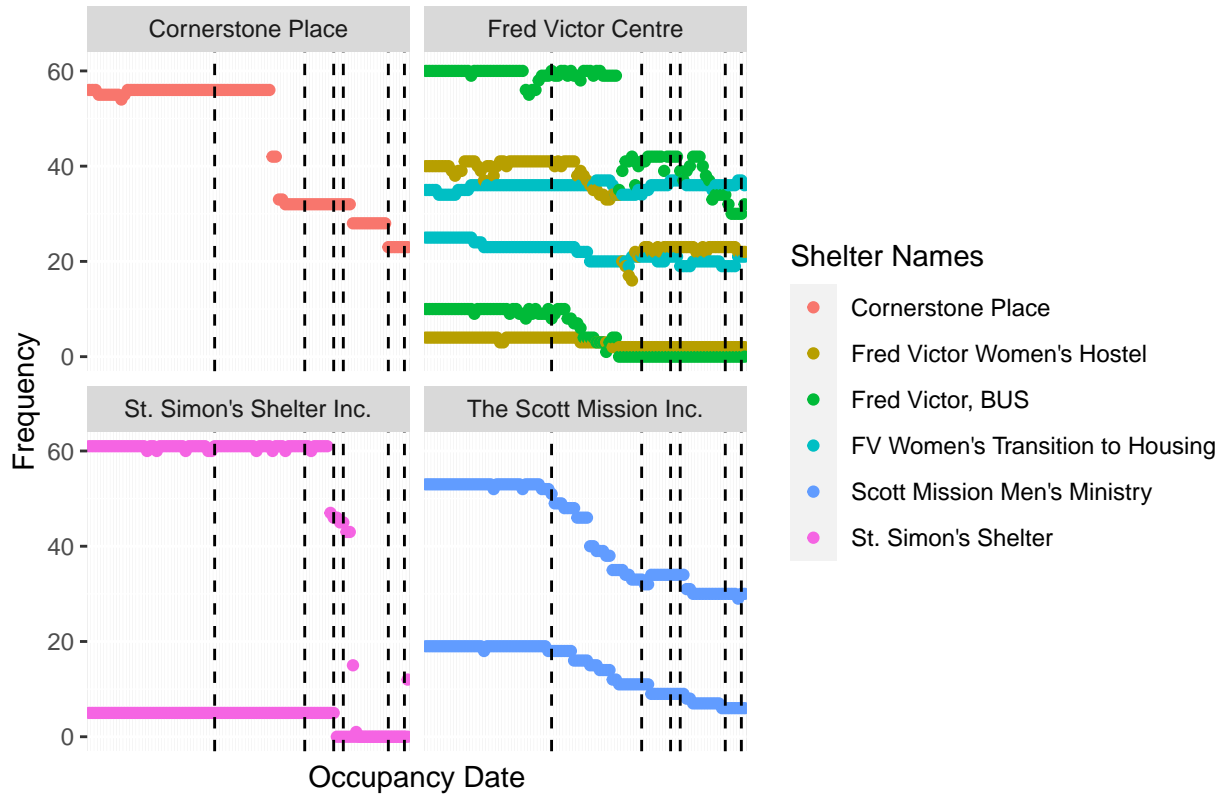


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## Shelters Occupancy to Capacity Percent by Organizations (Women)



## Shelters Occupancy Count by Organizations



Unlike our initial thoughts, we have discovered that the number of occupancies in shelters have been generally decreasing or stable. However, there has been an interesting correlation between the decline in occupancies and the reported dates of active COVID-19 outbreaks in shelters. The dates of the active cases are indicated by the dashed black lines and as seen from the graph above, it is clear that some of these dates coincide with the sudden drop in occupancies. One possible explanation of this trend can be interpreted as a direct consequence of an outbreak occurring in the said shelter. For example, When there was an outbreak reported at St. Simon's Shelter on May 16th, the immediate drop in occupancies can be seen on the graph (as indicated by the second last line). However, a similar relationship, between occupancy counts and day of an outbreak, could be noticed even in locations that are not directly affected by the outbreak. Such correlation can be explained by many residents leaving the facilities in response to ongoing outbreaks in the surrounding shelters.

## Waiting for profiling to be done...

	est	2.5%	97.5%	Pr(> z )
(Intercept)	43.826	43.599	44.053	0
categoryCo-ed	0.729	0.722	0.736	0
categoryFamilies	1.385	1.373	1.397	0
categoryWomen	0.648	0.643	0.654	0
categoryYouth	0.697	0.688	0.705	0
CAPACITY	1.003	1.003	1.003	0
cityEtobicoke	0.298	0.258	0.343	0
cityNorth York	0.058	0.051	0.067	0
cityScarborough	0.704	0.685	0.724	0
CAPACITY:cityEtobicoke	1.036	1.031	1.042	0

	est	2.5%	97.5%	Pr(> z )
CAPACITY:cityNorth York	1.081	1.077	1.085	0
CAPACITY:cityScarborough	1.010	1.010	1.010	0

## Waiting for profiling to be done...

	est	2.5%	97.5%	Pr(> z )
(Intercept)	29.492	29.322	29.663	0.000
categoryCo-ed	1.010	1.001	1.020	0.039
categoryFamilies	1.325	1.313	1.337	0.000
categoryWomen	0.713	0.706	0.720	0.000
categoryYouth	0.781	0.771	0.792	0.000
CAPACITY	1.004	1.004	1.004	0.000
cityEtobicoke	0.433	0.374	0.500	0.000
cityNorth York	0.099	0.088	0.111	0.000
cityScarborough	1.012	0.987	1.039	0.353
CAPACITY:cityEtobicoke	1.025	1.020	1.030	0.000
CAPACITY:cityNorth York	1.067	1.063	1.070	0.000
CAPACITY:cityScarborough	1.005	1.005	1.005	0.000

```
## Likelihood ratio test
##
## Model 1: OCCUPANCY ~ SECTOR + CAPACITY + SHELTER_CITY
## Model 2: OCCUPANCY ~ category + CAPACITY * city
##   #Df  LogLik Df  Chisq Pr(>Chisq)
## 1    9 -125565
## 2   12 -123424  3 4283.5 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

The generalised linear model follows a Poisson regression with a log link, where the response represents the number of homeless clients in a shelter on that day. The covariates in the model are: SECTOR (categorization of the type of residents from “Men”, “Women”, “Families”, “Co-ed” and “Youth”), SHELTER\_CITY (the city of the shelter locations from “Toronto”, “North York”, “Scarborough” and “Etobicoke”), and CAPACITY (the maximum number of beds available for the residents).

The baseline represents the number of male homeless clients who are visiting a Toronto shelter.

From the first table above which models pre-COVID-19 data (before March 17), we can see that majority of the clients in shelters are families, with males coming in second. This is likely because families come in at least pairs in numbers. The second table which models data during the pandemic (March 17 and onwards) shows relatively similar results with families still being the most predominant groups of clients and males coming in second once again. However, it is possible to observe that there are more women and youth occupants now than before. We believe this emphasis is a result of the overall number of occupants being almost halved during the pandemic (as seen from the graphs above).