Analysis of Food Banks over COVID*

My subtitle if needed

Will Davidson

1 February 2023

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

```
#### Preamble ####
# Purpose: Read in data from the Food Banks and make a
# graph of the number of people who used them before and after Covid
# Author: Will Davidson
# Email: davidsonwill200@gmail.com
# Date: 3 February 2023

#### Workspace set-up ####
install.packages("opendatatoronto")
```

```
Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.2'
(as 'lib' is unspecified)
```

```
install.packages("lubridate")
```

```
Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.2'
(as 'lib' is unspecified)
```

```
install.packages("knitr")
```

```
Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.2'
(as 'lib' is unspecified)
```

*Code and data are available at: LINK.

```r
library(knitr)
library(janitor)
```

```
Attaching package: 'janitor'

The following objects are masked from 'package:stats':

    chisq.test, fisher.test
```

```r
library(lubridate)
```

```
Attaching package: 'lubridate'

The following objects are masked from 'package:base':

    date, intersect, setdiff, union
```

```r
library(opendatatoronto)
library(tidyverse)
```

```
-- Attaching packages --------------------------------------- tidyverse 1.3.2
--

v ggplot2 3.4.0     v purrr   1.0.1
v tibble  3.1.8     v dplyr   1.1.0
v tidyr   1.3.0     v stringr 1.5.0
v readr   2.1.3     v forcats 1.0.0
-- Conflicts ------------------------------------------ tidyverse_conflicts() --
x lubridate::as.difftime() masks base::as.difftime()
x lubridate::date()        masks base::date()
x dplyr::filter()          masks stats::filter()
x lubridate::intersect()   masks base::intersect()
x dplyr::lag()             masks stats::lag()
x lubridate::setdiff()     masks base::setdiff()
x lubridate::union()       masks base::union()
```

```
library(tidyverse) # A collection of data-related packages
library(janitor) # Helps clean datasets
```

```
#### Acquire ####
food_banks <-
  # Each package is associated with a unique id  found in the "For
  # Developers" tab of the relevant page from Open Data Toronto
  # https://open.toronto.ca/dataset/toronto-s-dashboard-key-indicators/
  list_package_resources("c6d64e9b-f85a-4084-be14-60cf18509203") |>
  # Within that package, we are interested in the 2021 dataset
  filter(name ==
    "Toronto progress portal - Key metrics") |>
  # Having reduced the dataset to one row we can get the resource
  get_resource()

write_csv(
  x = food_banks,
  file = "food_banks.csv"
)

head(food_banks)
```

```
# A tibble: 6 x 17
  `_id` measur~1 measu~2 inter~3 value~4 measu~5 year_~6 budge~7 decim~8 desir~9
  <int>    <dbl> <chr>   <chr>   <chr>     <dbl>   <dbl>   <dbl>   <int> <chr>
1     1     1.13 Number~ m       n          2307    0.05      NA      NA Down
2     2     1.13 Number~ m       n          2369    0.05      NA      NA Down
3     3     1.13 Number~ m       n          2715    0.05      NA      NA Down
4     4     1.13 Number~ m       n          2651    0.05      NA      NA Down
5     5     1.13 Number~ m       n          2931    0.05      NA      NA Down
6     6     1.13 Number~ m       n          2645    0.05      NA      NA Down
# ... with 7 more variables: category <chr>, data_source_notes <chr>,
#   city_perspective_note <chr>, year <int>, period_number_in_year <int>,
#   target <dbl>, note <chr>, and abbreviated variable names 1: measure_id,
#   2: measure_name, 3: interval_type, 4: value_type, 5: measure_value,
#   6: year_to_date_variance, 7: budget_variance, 8: decimal_accuracy,
#   9: desired_direction
```

```
food_banks_clean <-
  clean_names(food_banks) |>
```

```
  select(measure_value, id, year)

head(food_banks_clean)
```

```
# A tibble: 6 x 3
  measure_value    id  year
          <dbl> <int> <int>
1          2307     1  2007
2          2369     2  2007
3          2715     3  2007
4          2651     4  2007
5          2931     5  2007
6          2645     6  2007
```

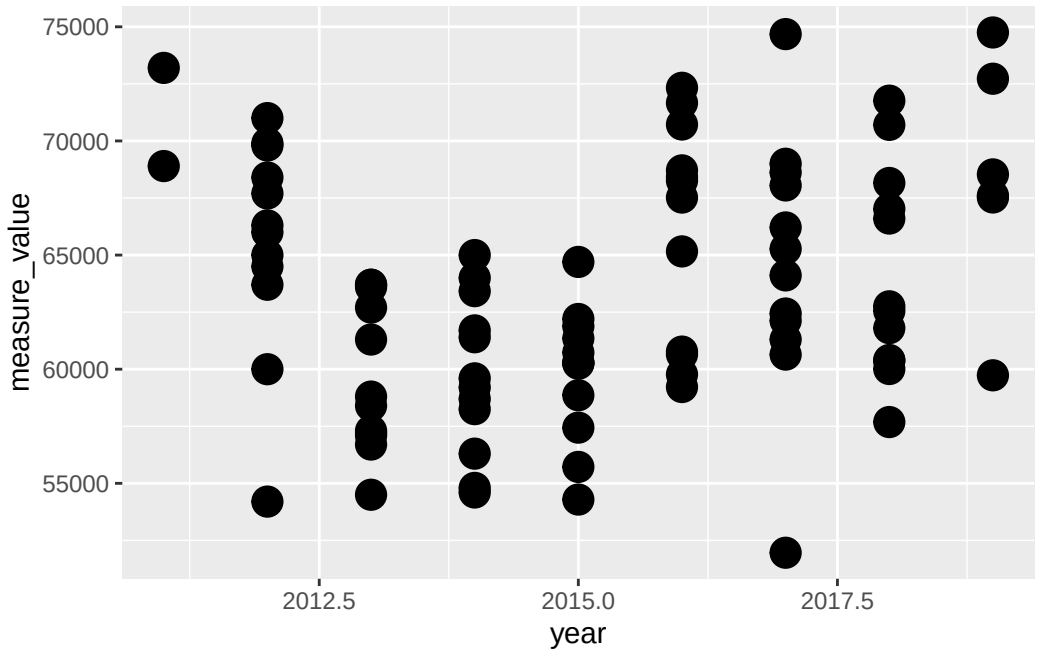
```
#### Explore ####
food_banks_clean <-
  clean_names(food_banks) |>
  slice(4018:4109)

head(food_banks_clean)
```

```
# A tibble: 6 x 17
     id measur~1 measu~2 inter~3 value~4 measu~5 year_~6 budge~7 decim~8 desir~9
  <int>    <dbl> <chr>   <chr>   <chr>     <dbl>   <dbl>   <dbl>   <int> <chr>
1  4018     1.26 "Food ~ m       n         73200    0.02      NA      NA Down
2  4019     1.26 "Food ~ m       n         68900    0.02      NA      NA Down
3  4020     1.26 "Food ~ m       n         69800    0.02      NA      NA Down
4  4021     1.26 "Food ~ m       n         67700    0.02      NA      NA Down
5  4022     1.26 "Food ~ m       n         69900    0.02      NA      NA Down
6  4023     1.26 "Food ~ m       n         64500    0.02      NA      NA Down
# ... with 7 more variables: category <chr>, data_source_notes <chr>,
#   city_perspective_note <chr>, year <int>, period_number_in_year <int>,
#   target <dbl>, note <chr>, and abbreviated variable names 1: measure_id,
#   2: measure_name, 3: interval_type, 4: value_type, 5: measure_value,
#   6: year_to_date_variance, 7: budget_variance, 8: decimal_accuracy,
#   9: desired_direction
```

```
write_csv(
  x = food_banks_clean,
  file = "cleaned_food_banks.csv"
)
```

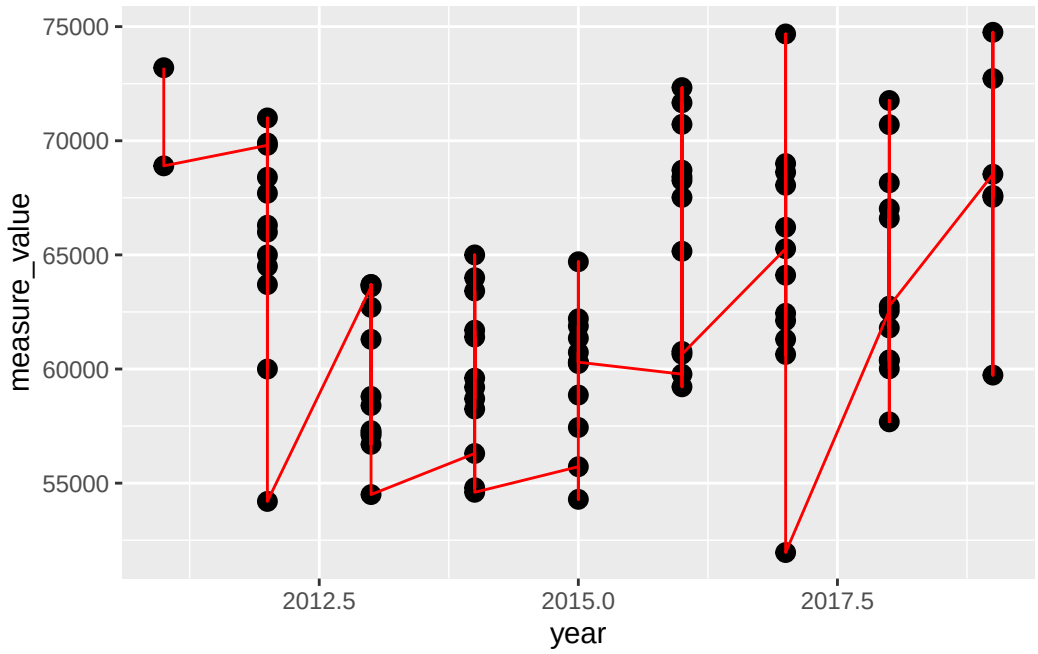
```
ggplot(data = food_banks_clean,
       mapping = aes(x = year,
                     y = measure_value))+
  geom_point(size=5)
```




```
  geom_line(colour = "red")
```

```
geom_line: na.rm = FALSE, orientation = NA
stat_identity: na.rm = FALSE
position_identity
```

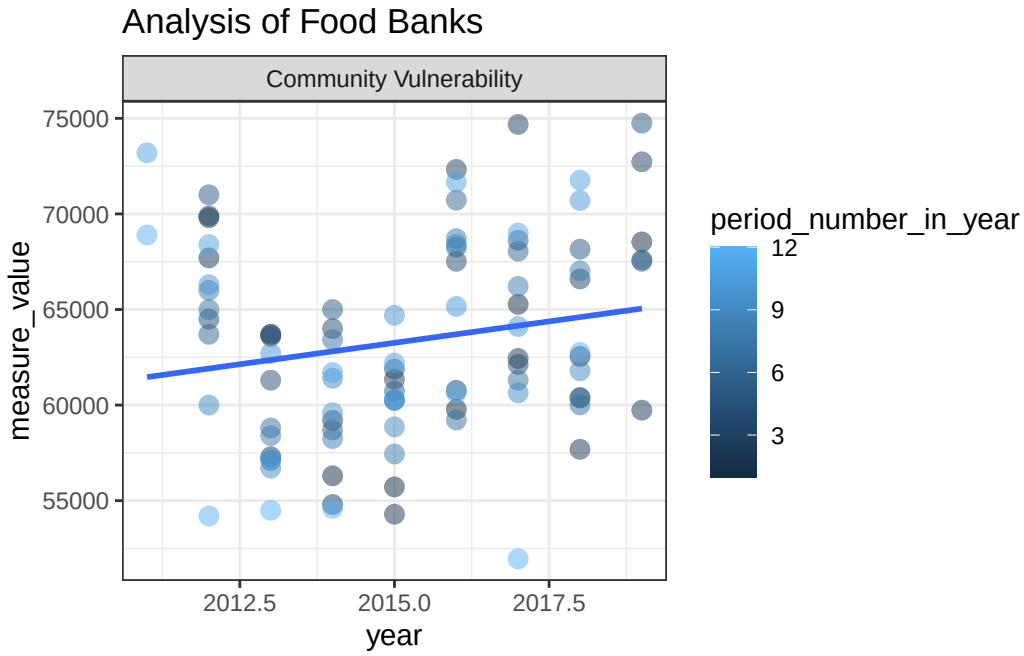
```
ggplot(food_banks_clean, aes(year, measure_value))+
  geom_point(size=3)+
  geom_line(colour = "red")
```




```
food_banks_clean %>%
  ggplot(aes(year, measure_value,
             colour = period_number_in_year))+
  geom_point(size = 3, alpha = 0.5)+
  geom_smooth(method = lm, se = F)+
  facet_wrap(~category)+
  labs(title = "Analysis of Food Banks")+
  theme_bw()
```

```
`geom_smooth()` using formula = 'y ~ x'
```

```
Warning: The following aesthetics were dropped during statistical transformation: colour
i This can happen when ggplot fails to infer the correct grouping structure in
  the data.
i Did you forget to specify a `group` aesthetic or to convert a numerical
  variable into a factor?
```



food_banks_clean <- clean_names(food_banks) |> select(measure_value, id, year)

head(food_banks_clean)

food_banks_clean <- clean_names(food_banks) |> slice(8489:8551)

head(food_banks_clean)

write_csv(x = food_banks_clean, file = "super_cleaned_food_banks.csv")

```
super_cleaned_food_banks <- ggplot(food_banks_clean, aes(x = year, y = measure_value,
  colour = period_number_in_year))+
geom_point(size = 3, alpha = 0.5)+
geom_smooth(method = lm, se = F)+
facet_wrap(~category)+
labs(title = "Analysis of Community Housing- Individual")+
theme_bw()
```

```
food_banks_clean <-
  clean_names(food_banks) |>
  select(measure_value, id, year)

head(food_banks_clean)
```

```
# A tibble: 6 x 3
  measure_value    id  year
          <dbl> <int> <int>
1          2307     1  2007
2          2369     2  2007
3          2715     3  2007
4          2651     4  2007
5          2931     5  2007
6          2645     6  2007
```

```
food_banks_clean <-
  clean_names(food_banks) |>
  slice(8552:8614)

head(food_banks_clean)
```

```
# A tibble: 6 x 17
     id measur~1 measu~2 inter~3 value~4 measu~5 year_~6 budge~7 decim~8 desir~9
  <int>    <dbl> <chr>   <chr>   <chr>     <dbl>   <dbl>   <dbl>   <int> <chr>
1  8552     2.26 Shelte~ q       n          2853      NA      NA      NA Down
2  8553     2.26 Shelte~ q       n          2908      NA      NA      NA Down
3  8554     2.26 Shelte~ q       n          2803      NA      NA      NA Down
4  8555     2.26 Shelte~ q       n          2747      NA      NA      NA Down
5  8556     2.26 Shelte~ q       n          2829      NA      NA      NA Down
6  8557     2.26 Shelte~ q       n          2841      NA      NA      NA Down
# ... with 7 more variables: category <chr>, data_source_notes <chr>,
#   city_perspective_note <chr>, year <int>, period_number_in_year <int>,
#   target <dbl>, note <chr>, and abbreviated variable names 1: measure_id,
#   2: measure_name, 3: interval_type, 4: value_type, 5: measure_value,
#   6: year_to_date_variance, 7: budget_variance, 8: decimal_accuracy,
#   9: desired_direction
```

```
write_csv(
  x = food_banks_clean,
  file = "supered_cleaned_food_banks.csv"
)

super_cleaned_food_banks <-
ggplot(food_banks_clean, aes(year, measure_value,
  colour = period_number_in_year))+
```

```
  geom_point(size = 3, alpha = 0.5)+
  geom_smooth(method = lm, se = F)+
  facet_wrap(~category)+
  labs(title = "Analysis of Community Housing- Family")+
  theme_bw()
```

```
  food_banks_clean <-
    clean_names(food_banks) |>
    select(measure_value, id, year)

  head(food_banks_clean)
```

```
# A tibble: 6 x 3
  measure_value    id  year
          <dbl> <int> <int>
1          2307     1  2007
2          2369     2  2007
3          2715     3  2007
4          2651     4  2007
5          2931     5  2007
6          2645     6  2007
```

```
  food_banks_clean <-
    clean_names(food_banks) |>
    slice(1703:1867)

  head(food_banks_clean)
```

```
# A tibble: 6 x 17
     id measur~1 measu~2 inter~3 value~4 measu~5 year_~6 budge~7 decim~8 desir~9
  <int>    <dbl> <chr>   <chr>   <chr>     <dbl>   <dbl>   <dbl>   <int> <chr>
1  1703     1.05 Averag~ m       n          34.5      NA      NA       2 Up
2  1704     1.05 Averag~ m       n          36.2      NA      NA       2 Up
3  1705     1.05 Averag~ m       n          36.2      NA      NA       2 Up
4  1706     1.05 Averag~ m       n          36.8      NA      NA       2 Up
5  1707     1.05 Averag~ m       n          36.6      NA      NA       2 Up
6  1708     1.05 Averag~ m       n          35.9      NA      NA       2 Up
# ... with 7 more variables: category <chr>, data_source_notes <chr>,
#   city_perspective_note <chr>, year <int>, period_number_in_year <int>,
```

```
#   target <dbl>, note <chr>, and abbreviated variable names 1: measure_id,
#   2: measure_name, 3: interval_type, 4: value_type, 5: measure_value,
#   6: year_to_date_variance, 7: budget_variance, 8: decimal_accuracy,
#   9: desired_direction
```

```
write_csv(
  x = food_banks_clean,
  file = "supersuper_cleaned_food_banks.csv"
)

super_cleaned_food_banks <-
ggplot(food_banks_clean, aes(year, measure_value,
  colour = period_number_in_year))+
geom_point(size = 3, alpha = 0.5)+
geom_smooth(method = lm, se = F)+
facet_wrap(~category)+
labs(title = "Average Home Price")+
theme_bw()
```

References

R Core Team (2022). R: A language and environment for statistical computing. R Foundation

for Statistical Computing, Vienna, Austria. URL https://www.R-project.org/.

H. Wickham. ggplot2: Elegant Graphics for Data Analysis.

Springer-Verlag New York, 2016.