Code last run 2021-10-25.
Daily: Data as of January 29, 2021.
Neighbourhood: Data as of January 28, 2021.

Task 1: Daily cases
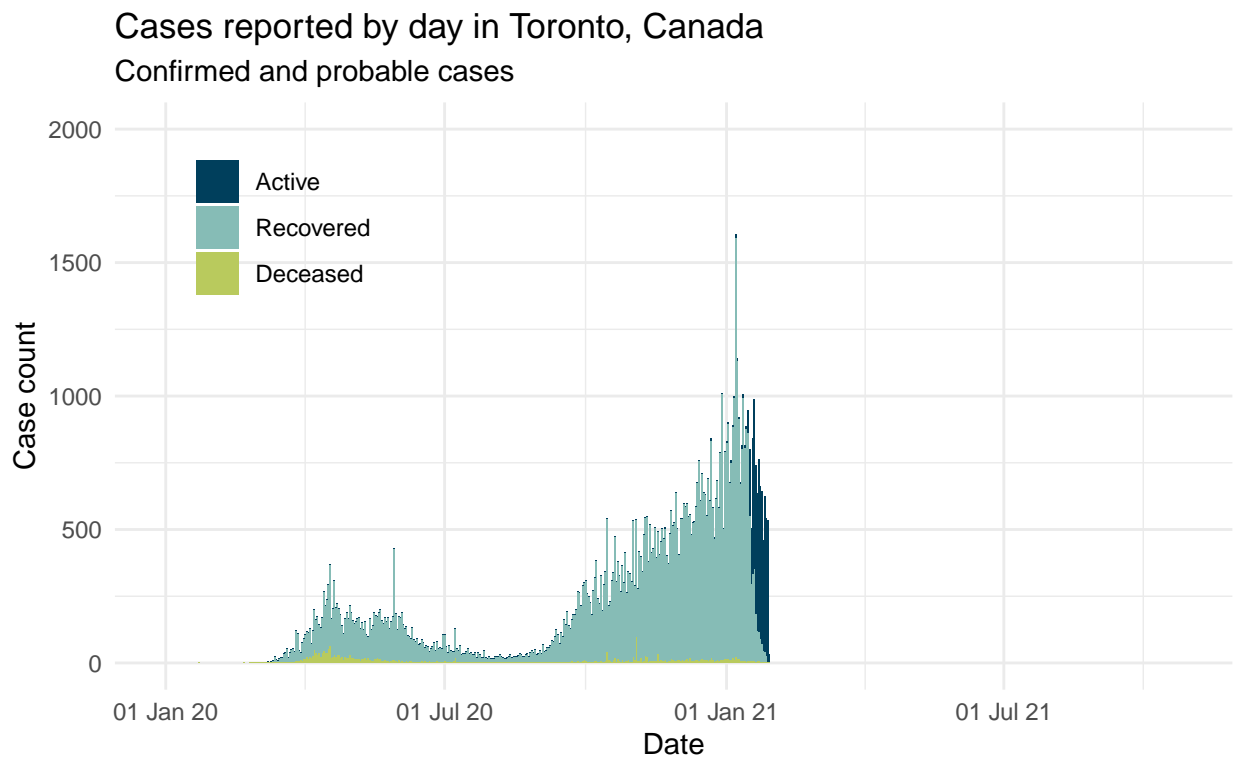
Data wrangling

```r
reported <- reported_raw %>%
  mutate_if(is.numeric, replace_na, replace=0) %>%
  rename(Recovered = recovered) %>%
  rename(Active = active) %>%
  rename(Deceased = deceased) %>%
  pivot_longer(-c(reported_date), names_to = "Type", values_to = "Count") %>%
  mutate(Type = fct_relevel(Type, "Recovered", after = 1))

reported$reported_date = date(reported$reported_date)
```

Data visualization

```
reported %>%
  ggplot(aes(x=reported_date, y = Count, fill = Type)) +
  geom_bar(stat = "identity", width = 1) +
  scale_fill_manual(values = c("#003F5C", "#86BCB6", "#B9CA5D")) +
  scale_x_date(labels = scales::date_format("%d %b %y"), limits=c(date("2020-01-01"),Sys.Date())) +
  scale_y_continuous(limits = c(NA,2000)) +
  labs(title ="Cases reported by day in Toronto, Canada",
       subtitle = "Confirmed and probable cases",
       x = "Date",
       y = "Case count",
       caption = str_c("Created by: Eddie Moon for STA303/1002, U of T\nSource: Ontario Ministry of Heal
  theme_minimal() +
  theme(legend.title = element_blank(), legend.position = c(.15, .8))
```


Cases reported by day in Toronto, Canada
Confirmed and probable cases

Created by: Eddie Moon for STA303/1002, U of T
Source: Ontario Ministry of Health, Integrated Public Health Information System and CORES
Data as of January 29, 2021

Task 2: Outbreak type

Data wrangling

```r
outbreak <- outbreak_raw %>%
  rename(Type = outbreak_or_sporadic) %>%
  rename(Week = episode_week) %>%
  rename(Cases = cases) %>%
  mutate(Type = fct_relevel(Type, "OB Associated", after = 1))

outbreak$Week = date(outbreak$Week)
```

Data visualization

```
outbreak %>%
  ggplot(aes(x=Week, y = Cases, fill = Type)) +
  geom_bar(stat = "identity") +
  scale_fill_manual(values = c("#86BCB6", "#B9CA5D")) +
  scale_x_date(labels = scales::date_format("%d %b %y"), limits=c(date("2020-01-01"),Sys.Date()+7)) +
  scale_y_continuous(limits = c(NA,6800)) +
  labs(title ="Cases by outbreak type and week in Toronto, Canada",
       subtitle = "Confirmed and probable cases",
       x = "Date",
       y = "Case count",
       caption = str_c("Created by: Eddie Moon for STA303/1002, U of T\nSource: Ontario Ministry of Heal
  theme_minimal() +
  theme(legend.title = element_blank(), legend.position = c(.15, .8))
```


Cases by outbreak type and week in Toronto, Canada
Confirmed and probable cases
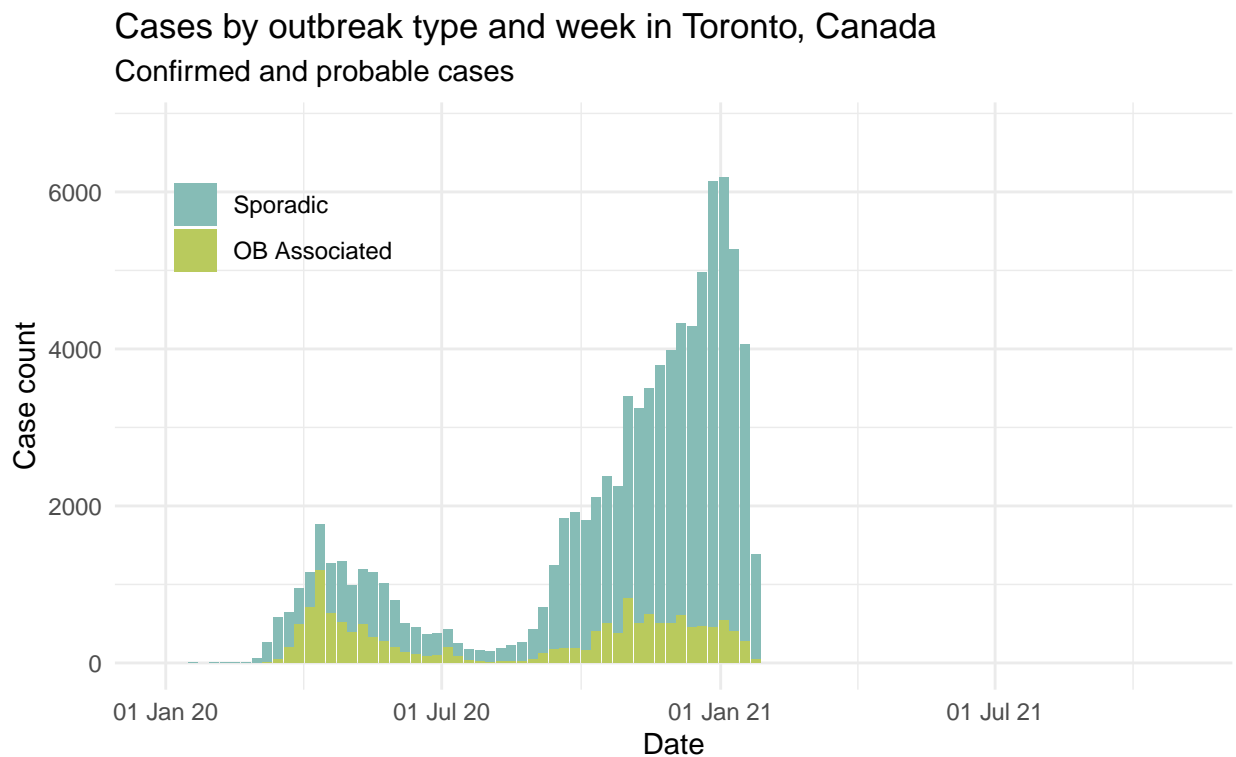
Created by: Eddie Moon for STA303/1002, U of T
Source: Ontario Ministry of Health, Integrated Public Health Information System and CORES
Data as of January 29, 2021

Task 3: Neighbourhoods

Data wrangling: part 1

```r
income <- nbhood_profile %>%
  filter(`_id` == 1143) %>%
  select(-c(Category, Topic, "Data Source", Characteristic)) %>%
  pivot_longer(-c(`_id`), names_to = "Neighbourhood", values_to = "Percentage")

income$Percentage = as.numeric(income$Percentage)
```

Data wrangling: part 2

```r
nbhoods_shape_raw[19, 7] = "North St. James Town"
nbhoods_shape_raw[41, 7] = "Weston-Pelham Park"
nbhoods_shape_raw[115, 7] = "Cabbagetown-South St. James Town"

nbhoods_all <- nbhoods_shape_raw %>%
  rename(neighbourhood_name = AREA_NAME) %>%
  mutate(neighbourhood_name = str_remove(neighbourhood_name, "\\s\\(\\d+\\)$")) %>%
  right_join(income,  by = c("neighbourhood_name" = "Neighbourhood")) %>%
  left_join(nbhood_raw,  by = c("neighbourhood_name" = "neighbourhood_name")) %>%
  rename(rate_per_100000 = rate_per_100_000_people) %>%
  filter(neighbourhood_name != "City of Toronto")
```

Data wrangling: part 3

```r
nbhoods_final <- nbhoods_all %>%
  mutate(med_inc = median(Percentage)) %>%
  mutate(med_rate = median(rate_per_100000)) %>%
  mutate(nbhood_type = case_when(
    (Percentage >= med_inc & rate_per_100000 >= med_rate) ~ "Higher low income rate, higher case rate",
    (Percentage >= med_inc & rate_per_100000 < med_rate) ~ "Higher low income rate, lower case rate",
    (Percentage < med_inc & rate_per_100000 >= med_rate) ~ "Lower low income rate, higher case rate",
    (Percentage < med_inc & rate_per_100000 < med_rate) ~ "Lower low income rate, lower case rate"))
```

Data visualization

```
nbhoods_final %>%
  ggplot() +
  geom_sf(aes(fill = Percentage)) +
  scale_fill_gradient(name = "% low income", low = "darkgreen", high = "lightgrey") +
  theme_map() +
  labs(title = "Percentage of 18 to 64 year olds living in a low income family (2015)",
       subtitle = "Neighbourhoods of Toronto, Canada",
       caption = str_c("Created by: Eddie Moon for STA303/1002, U of T\nSource: Census Profile 98-316-X
  theme(legend.position = "right")
```

Percentage of 18 to 64 year olds living in a low income family (2015)
Neighbourhoods of Toronto, Canada

Created by: Eddie Moon for STA303/1002, U of T
Source: Census Profile 98–316–X2016001 via OpenData Toronto
Data as of January 28, 2021
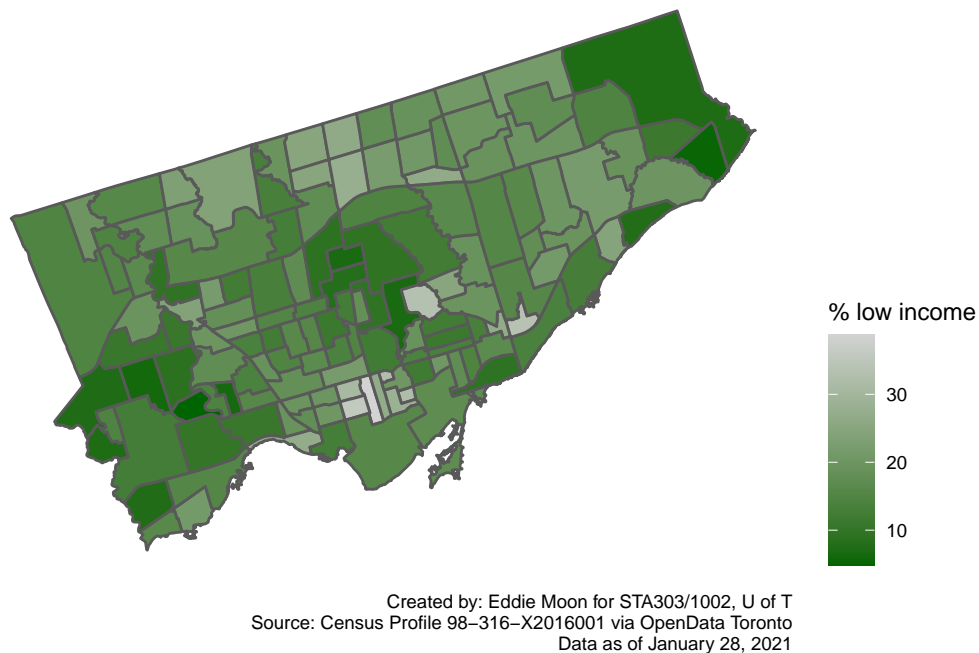
```
nbhoods_final %>%
  ggplot() +
  geom_sf(aes(fill = rate_per_100000)) +
  scale_fill_gradient(name = "Cases per 100,000 people", low = "white", high = "darkorange") +
  theme_map() +
  labs(title = "COVID-19 cases per 100,000, by neighbourhood in Toronto, Canada",
       caption = str_c("Created by: Eddie Moon for STA303/1002, U of T\nSource: Ontario Ministry of Hea
  theme(legend.position = "right")
```
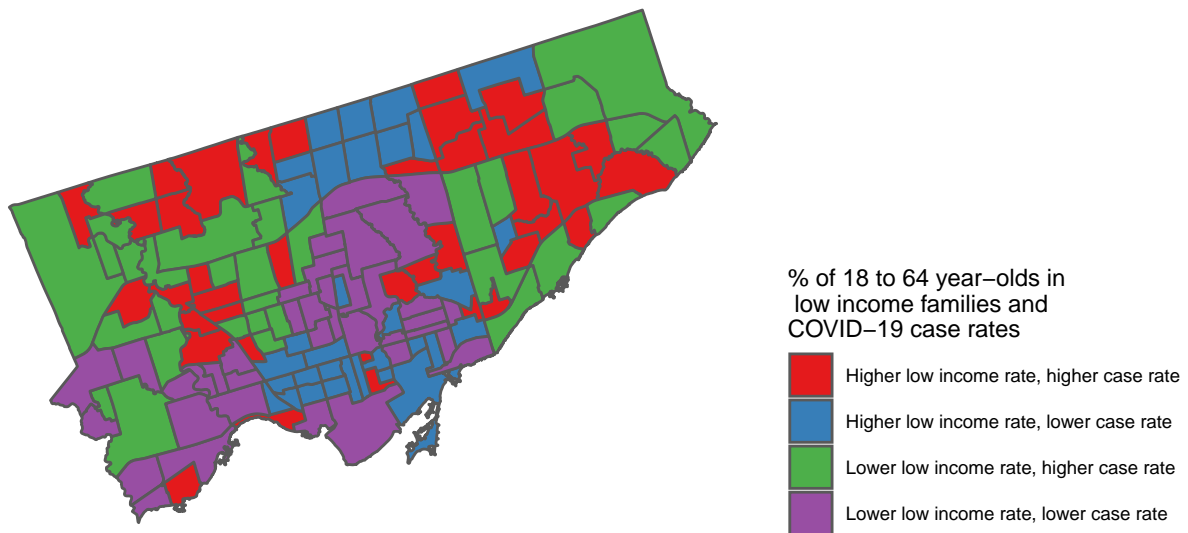
COVID−19 cases per 100,000, by neighbourhood in Toronto, Canada
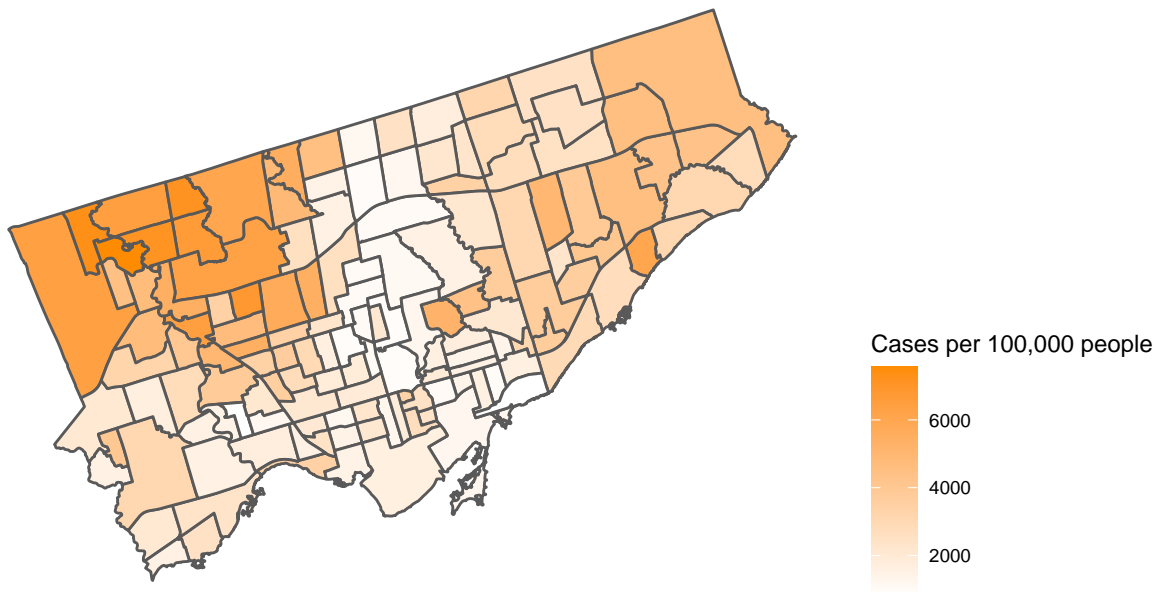
Created by: Eddie Moon for STA303/1002, U of T
Source: Ontario Ministry of Health, Integrated Public Health Information System and CORES
Data as of January 28, 2021

```
nbhoods_final %>%
  ggplot() +
  geom_sf(aes(fill = nbhood_type)) +
  scale_fill_brewer(name = "% of 18 to 64 year-olds in\n low income families and\nCOVID-19 case rates",
                    palette = "Set1") +
  theme_map() +
  labs(title = "COVID-19 cases per 100,000, by neighbourhood in Toronto, Canada",
       caption = str_c("Created by: Eddie Moon for STA303/1002, U of T\nIncome data source: Census Prof
  theme(legend.position = "right")
```

COVID−19 cases per 100,000, by neighbourhood in Toronto, Canada

% of 18 to 64 year−olds in
 low income families and
COVID−19 case rates

Higher low income rate, higher case rate

Higher low income rate, lower case rate

Lower low income rate, higher case rate

Lower low income rate, lower case rate

Created by: Eddie Moon for STA303/1002, U of T
Income data source: Census Profile 98–316–X2016001 via OpenData Toronto
COVID data source: Ontario Ministry of Health, Integrated Public
Health Information System and CORES
Data as of January 28, 2021