Met and Unmet Needs Mapping

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```
library(here)
library(tidyverse)

library(choroplethr)

library(choroplethrZip)
library(choroplethrMaps)

library(usmap)
```

```
tgcp_svi <- readRDS(here("cleaned_STATCOM_data_SVI.rds"))
```

There are 634 (12%) clients with missing zip codes. Thus, the maps show only the clients with non-missing zip codes.

```
zip_code_summary <- tgcp_svi[!is.na(tgcp_svi$ClientZipCode), ] %>% group_by(ClientZipCode) %>% summaris

zip_code_num_clients <- data.frame(region = as.character(zip_code_summary$ClientZipCode),
                                   value = zip_code_summary$num_clients)

zip_code_prop_clients <- data.frame(region = as.character(zip_code_summary$ClientZipCode),
                                   value = round(zip_code_summary$prop_clients, digits = 3))
```

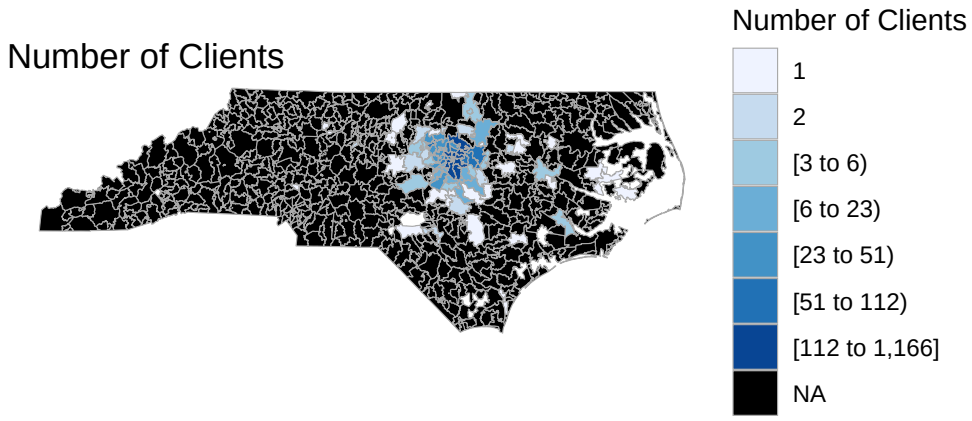
```
data(zip.regions)

zip_list <- zip_code_num_clients$region

north_carolina_zip <- zip.regions$region[zip.regions$state.name == "north carolina"]

virginia_zip <- zip.regions$region[zip.regions$state.name == "virginia"]

west_virginia_zip <- zip.regions$region[zip.regions$state.name == "west virginia"]

atleast5_zip <- zip_code_num_clients$region[zip_code_num_clients$value > 4 &
                                                    !is.na(zip_code_num_clients$region)]
```

```
zip_code_summary_subset <- zip_code_summary[zip_code_summary$ClientZipCode %in% atleast5_zip, ]

score <- rank(zip_code_summary_subset$num_clients, ties.method = "average")
# score <- score / max(score)

zip_code_rank_num_clients <- data.frame(region = as.character(zip_code_summary_subset$ClientZipCode),
                                   value = score)
```

First, mapping all the zip codes in the data set, in North Carolina.

For the zip codes that are not in North Carolina, one zip code is from Virginia (with one client), one zip code is from West Virginia (with one client) and the rest are typos.

```
# manhattan_les = c("10002", "10003", "10009")
# manhattan_ues = c("10021", "10028", "10044", "10128")
zip_choropleth(zip_code_num_clients,
               # zip_zoom = c(manhattan_les, manhattan_ues),
               state_zoom = c("north carolina"),
               title    = "Number of Clients",
               legend   = "Number of Clients",
               num_colors = 9)
```




```
zip.regions.tgcp <- zip.regions[zip.regions$region %in% atleast5_zip, ]

tgcp_county_name_code <- unique(cbind(zip.regions.tgcp$county.name, zip.regions.tgcp$county.fips.numeri
```

```
harnett_zip <- zip.regions$region[zip.regions$county.name == "harnett"]
johnston_zip <- zip.regions$region[zip.regions$county.name == "johnston"]
chatham_zip <- zip.regions$region[zip.regions$county.name == "chatham"]
wake_zip <- zip.regions$region[zip.regions$county.name == "wake"]
durham_zip <- zip.regions$region[zip.regions$county.name == "durham"]
orange_zip <- zip.regions$region[zip.regions$county.name == "orange"]
franklin_zip <- zip.regions$region[zip.regions$county.name == "franklin"]
nash_zip <- zip.regions$region[zip.regions$county.name == "nash"]
granville_zip <- zip.regions$region[zip.regions$county.name == "granville"]
```

```
intersect(atleast5_zip, harnett_zip) # contained within other counties

intersect(atleast5_zip, johnston_zip)

intersect(atleast5_zip, chatham_zip) # contained within other counties

intersect(atleast5_zip, wake_zip)

intersect(atleast5_zip, durham_zip)

intersect(atleast5_zip, orange_zip)

intersect(atleast5_zip, franklin_zip)
```

```
intersect(atleast5_zip, nash_zip) # contained within franklin

intersect(atleast5_zip, granville_zip) # contained within franklin
```

```
intersect(atleast5_zip, johnston_zip)
```

```
## [1] "27504" "27520" "27527" "27529" "27577" "27591" "27592" "27597" "27603"
```

```
intersect(atleast5_zip, wake_zip)
```

```
##  [1] "27502" "27511" "27513" "27518" "27519" "27520" "27523" "27526" "27529"
## [10] "27539" "27540" "27545" "27560" "27571" "27587" "27591" "27592" "27597"
## [19] "27601" "27603" "27604" "27605" "27606" "27607" "27608" "27609" "27610"
## [28] "27612" "27613" "27614" "27615" "27616" "27617" "27703"
```

```
intersect(atleast5_zip, durham_zip)
```

```
## [1] "27560" "27613" "27617" "27701" "27703" "27704" "27705" "27707" "27713"
```

```
intersect(atleast5_zip, orange_zip)
```

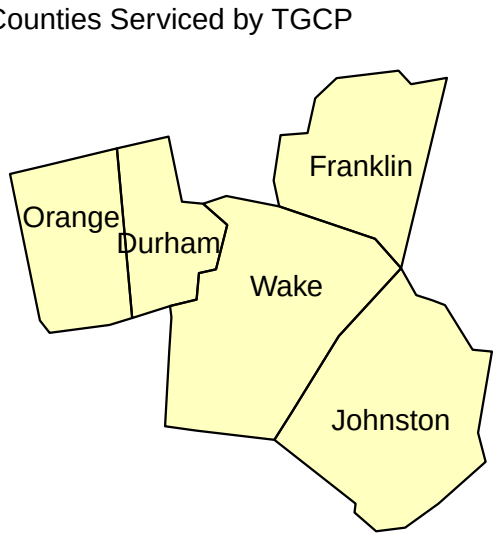
```
## [1] "27510" "27705" "27707"
```

```
intersect(atleast5_zip, franklin_zip)
```

```
## [1] "27549" "27587" "27597"
```

Five counties contain all the zip codes with at least 5 clients: Johnston, Wake, Durham, Orange, and Franklin

```
usmap::plot_usmap("counties", fill = "yellow", alpha = 0.25,
                  include = c("37101", "37183", "37063", "37135", "37069"),
                  labels = T) +
                  labs(title = "Counties Serviced by TGCP")
```



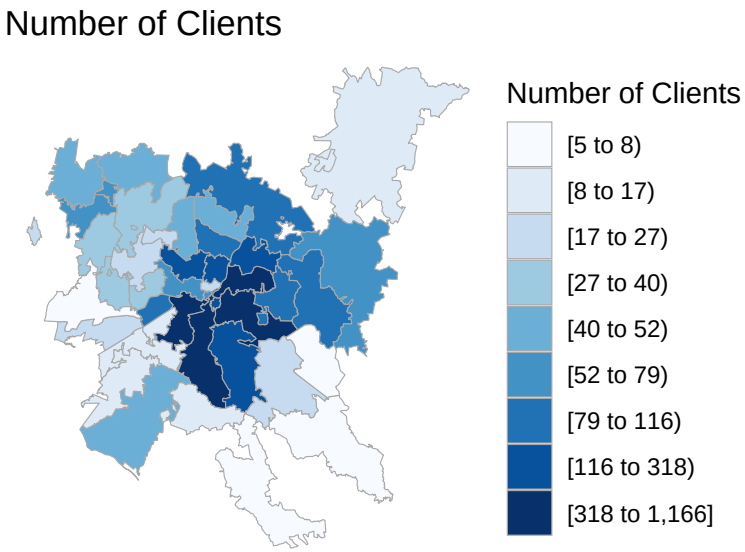

```
zip_code_num_clients[!(zip_code_num_clients$region %in% north_carolina_zip) & !is.na(zip_code_num_clien
```

```
zip_code_num_clients[(zip_code_num_clients$region %in% north_carolina_zip) & !is.na(zip_code_num_clients
```

```
zip_code_num_clients[(zip_code_num_clients$region %in% north_carolina_zip) & !is.na(zip_code_num_clients
```

```
zip_choropleth(zip_code_num_clients,
               zip_zoom = atleast5_zip,
```

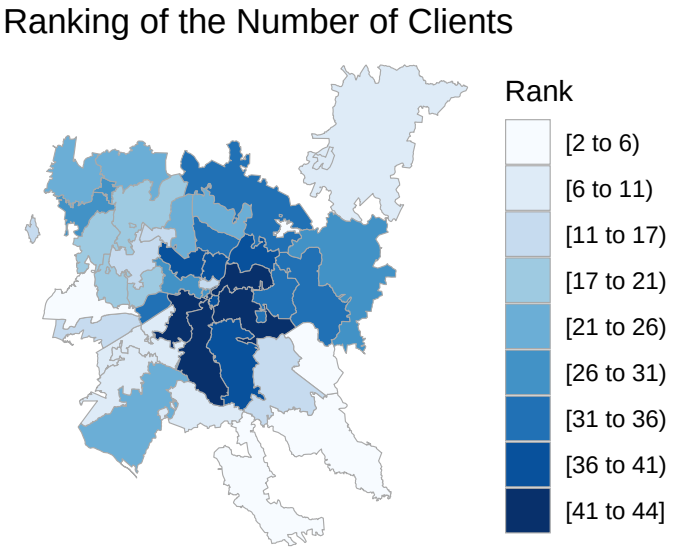
```
              title    = "Number of Clients",
              legend   = "Number of Clients",
              num_colors = 9)
```




```
zip_choropleth(zip_code_num_clients,
               zip_zoom = intersect(atleast5_zip, wake_zip),
               title    = "Number of Clients",
               legend   = "Number of Clients",
               num_colors = 9)
```

```
zip_choropleth(zip_code_prop_clients,
               zip_zoom = atleast5_zip,
               title    = "Proportion of Clients",
               legend   = "Proportion of Clients",
               num_colors = 9)
```

```
zip_choropleth(zip_code_rank_num_clients,
               zip_zoom = atleast5_zip,
               title    = "Ranking of the Number of Clients",
               legend   = "Rank",
               num_colors = 9)
```



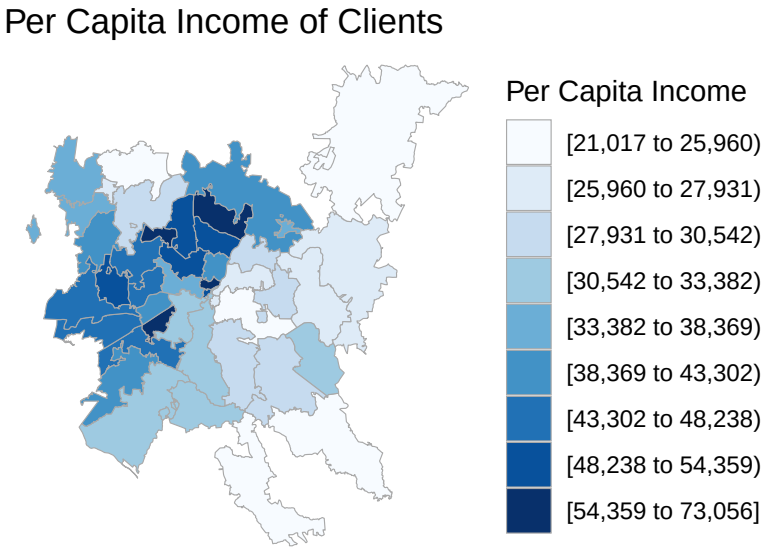

```
zip_choropleth(zip_code_rank_num_clients,
               zip_zoom = intersect(atleast5_zip, wake_zip),
               title    = "Ranking of the Number of Clients",
               legend   = "Rank",
               num_colors = 9)
```

```
zip_choropleth(zip_code_num_clients,
               # zip_zoom = c(manhattan_les, manhattan_ues),
               county_zoom = c("37101", "37183", "37063", "37135", "37069"),
               title    = "Number of Clients",
               legend   = "Number of Clients",
               num_colors = 9)
```

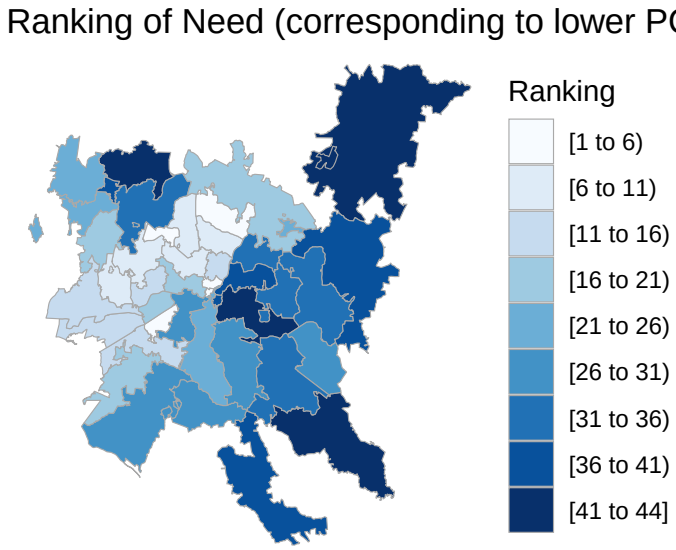
Unmet Needs Plot

```
# tgcp_atleast5 <- tgcp_svi[tgcp_svi$ClientZipCode %in% atleast5_zip, ]

tgcp_pci <- unique(cbind(tgcp_svi$ClientZipCode[!is.na(tgcp_svi$ClientZipCode)],
                         tgcp_svi$EP_PCI[!is.na(tgcp_svi$ClientZipCode)]))

zip_code_pci <- data.frame(region = as.character(tgcp_pci[, 1]), value = tgcp_pci[, 2])

tgcp_pci_subset <- tgcp_pci[tgcp_pci[, 1] %in% atleast5_zip, ]

score <- rank(-tgcp_pci_subset[, 2], ties.method = "average", na.last = "keep")
# score <- score / max(score, na.rm = T)

zip_code_rank_pci <- data.frame(region = as.character(tgcp_pci_subset[, 1]),
                                value = score)
```

```
zip_choropleth(zip_code_pci,
               zip_zoom = atleast5_zip,
               title    = "Per Capita Income of Clients",
               legend   = "Per Capita Income",
               num_colors = 9)
```




```
zip_choropleth(zip_code_rank_pci,
               zip_zoom = atleast5_zip,
               title    = "Ranking of Need (corresponding to lower PCI)",
               legend   = "Ranking",
               num_colors = 9)
```

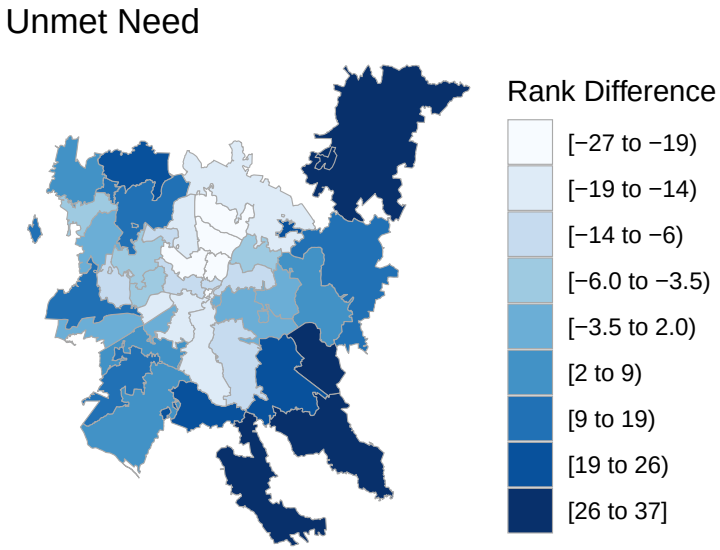


Difference of the "met" and "unmet" need rankings

```
zip_code_rank_num_pci <- left_join(zip_code_rank_num_clients, zip_code_rank_pci, by = "region")

zip_code_rank_diff <- data.frame(region = zip_code_rank_num_pci$region, value = zip_code_rank_num_pci$va

# zip_code_rank_diff_rank <- data.frame(region = zip_code_rank_num_pci$region, value = rank(zip_code_ra
```

```
zip_choropleth(zip_code_rank_diff,
               zip_zoom = atleast5_zip,
               title    = "Unmet Need",
               legend   = "Rank Difference",
```

```
                num_colors = 9)
```




```
zip_choropleth(zip_code_rank_diff,
               zip_zoom = atleast5_zip,
               title    = "Unmet Need",
               legend   = "Rank Difference",
               num_colors = 9,
               reference_map = T)
```