Geospatial[Redo]

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4/14/2019

Contents

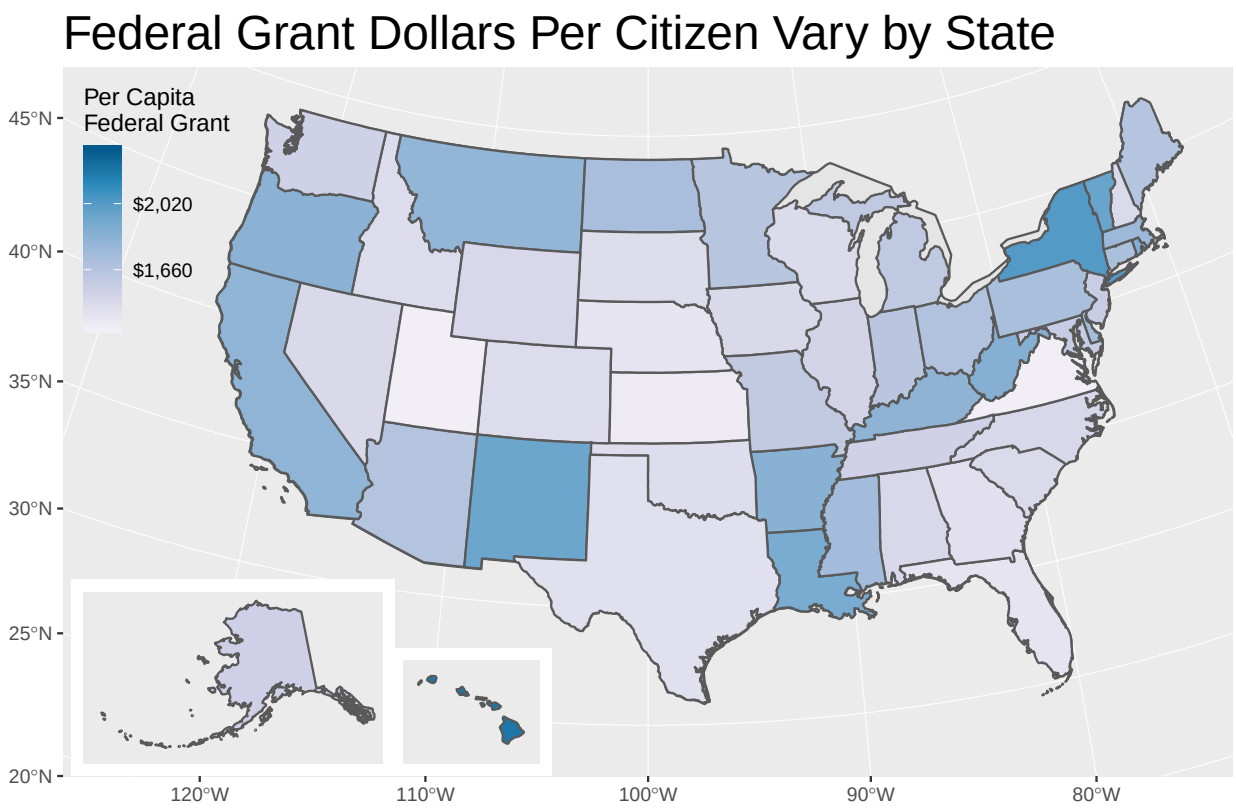

```
### Define Theme
custom_pal <- c("#3FC1C9", "#B9F3FF", "#8A4DCC", "#4DCC74", "#EEB9FF", "#CC534D", "#CC7776", "#FFF07A")

iltheme <- theme(text = element_text(family="Courier New", size=14),
                 plot.title = element_text(color="black",
                                           size=20,
                                           family="Verdana",
                                           hjust=0),
                plot.subtitle = element_text(color="#4c4e4d",
                                             size=16,
                                             hjust=0,
                                             family = "Verdana"),
                axis.title.x = element_text(color="black", size=20, family="Verdana"),
                axis.title.y = element_text(color="black", size=20, family="Verdana"),
                plot.caption = element_text(color="black", size=14, face="italic"),
                axis.text.x = element_text(size=14),
                axis.text.y = element_text(size=14),
                plot.background=element_rect(fill="white"),
                panel.background =element_rect(fill="white"),
                panel.grid.minor.y = element_blank(),
                axis.ticks = element_blank(),
                axis.line = element_line(size=1, color = "Black"),
                legend.text = element_text(size=16))
```

Federal Aid to State & Local Governments

In Fiscal Year 2018, the federal government was projected to grant about $728 billion to state and local governments. According to the Congressional Research Service, federal grants make up one-third of state spending, and more than half of state spending on health care and other public assistance programs. Since the expansion of Medicaid included in the Affordable Care Act (ACA), the amount of federal grant money flowing to health care has only increased.

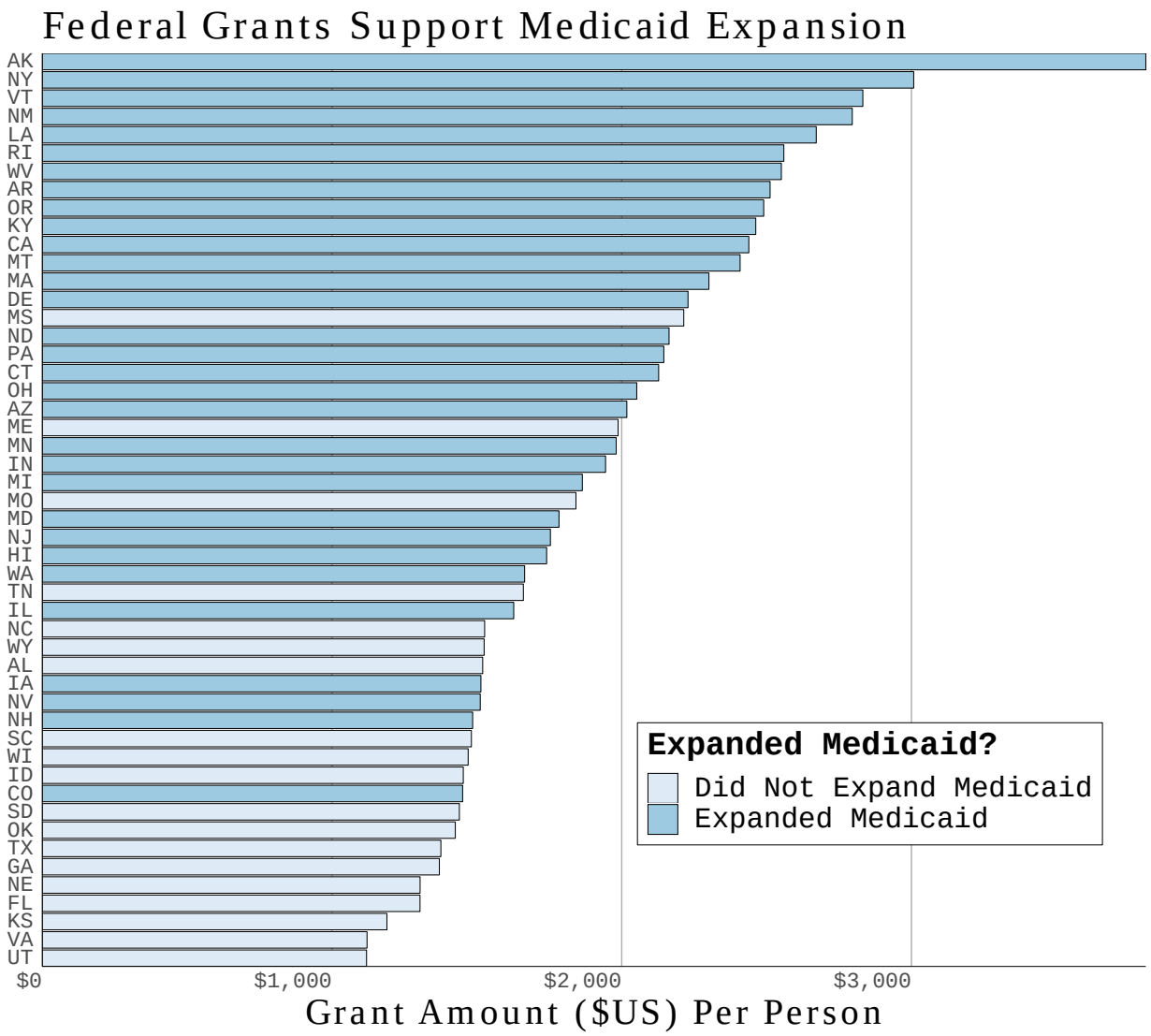
```
# For the first map + column chart (coded in this chunk)
raw_aid <- read_csv("../Raw Data/state aid - Sheet1.csv")

world <- ne_countries(scale='medium',returnclass = 'sf')
usa <- subset(world, admin == "United States of America")

alaska <- ggplot(data = usa) +
     geom_sf(fill = '#cfd0e7') +
     coord_sf(crs = st_crs(3467), xlim = c(-2400000, 1600000), ylim = c(200000,
```

```
        2500000), expand = FALSE, datum = NA)

hawaii  <- ggplot(data = usa) +
    geom_sf(fill='#1d77a8') +
    coord_sf(crs = st_crs(4135), xlim = c(-161, -154), ylim = c(18,
        23), expand = FALSE, datum = NA)

states <- st_as_sf(map("state", plot = FALSE, fill = TRUE))
states <- cbind(states, st_coordinates(st_centroid(states)))
states$ID <- toTitleCase(states$ID)

# Join aid data to states df
joined <- right_join(states, raw_aid, by=c("ID" = "NAME"))
breaks <- quantile(x = joined$`2018 grant per capita`,seq(0,1,.250))
bins <- cut(joined$`2018 grant per capita`, unique(breaks), include.lowest=TRUE)
joined$bin <- bins
bin_labels <- c("$1,450", "$1,660", "$2,020", "$2,460")
joined <- filter(joined, STUSPS != 'DC')

main <- (ggplot(data = usa) +
    geom_sf() +
   geom_sf(data = joined, aes(fill = `2018 grant per capita`)) +
    coord_sf(crs = st_crs(2163), xlim = c(-2500000, 2500000), ylim = c(-2300000,
        730000))) +
  scale_fill_distiller(palette = "PuBu",
                       direction = 1,
                       labels = bin_labels,
                       name="Per Capita\nFederal Grant") +
   annotation_custom(
      grob = ggplotGrob(alaska),
      xmin = -2750000,
      xmax = -2750000 + (1600000 - (-2400000))/2.5,
      ymin = -2450000,
      ymax = -2450000 + (2500000 - 200000)/2.5
  ) +
  annotation_custom(
      grob = ggplotGrob(hawaii),
      xmin = -1250000,
      xmax = -1250000 + (-154 - (-161))*120000,
      ymin = -2450000,
      ymax = -2450000 + (23 - 18)*120000
  ) +
  theme(legend.position = c(.08, .8),
        legend.background = element_blank(),
        plot.title = element_text(size = 22)) +
  labs(title = "Federal Grant Dollars Per Citizen Vary by State")

main
```




```
expanded <- c("AK", "HI", "NM", "AZ", "CA", "CO", "NV", "OR", "WA", "MT", "ND", "MN", "AR", "LA", "IA",
joined <- joined %>% mutate('Expanded' = case_when((STUSPS %in% expanded) ~ 'Expanded Medicaid', (!STUSI

column_pc <- ggplot(data = joined,
                    aes(x = reorder(STUSPS, `2018 grant per capita`),
                        y = `2018 grant per capita`)) +
  geom_col(data = joined,
           aes(fill = Expanded,
               labels = STUSPS),
           color="black",
           size=0.25) +
  iltheme +
  scale_y_continuous(name="Grant Amount ($US) Per Person",
                     labels = scales::dollar_format(),
```

```
                    expand = c(0,0)) +
  scale_x_discrete(name= element_blank(),
                   expand = expand_scale()) +
  scale_fill_brewer(palette = "Blues", name="Expanded Medicaid?") +
  theme(plot.title = element_text(size=22),
        panel.grid = element_blank(),
        panel.grid.major.y = element_blank(),
        panel.grid.major.x = element_line(colour = "#AFAFAF"),
        axis.text.x = element_text(size=12,
                                   hjust = 1),
        axis.text.y = element_text(size=12),
        legend.background = element_rect(size = .25,
                                         linetype="solid",
                                         colour ="black"),
        legend.text = element_text(size = 16),
        legend.title = element_text(size = 18,
                                    face = "bold"),
        panel.background = element_rect(fill = NA,
                                        size = .2),
        legend.position = c(.75, .2),
        axis.line = element_line(size = .25)) +
  labs(title = "Federal Grants Support Medicaid Expansion") +
  coord_flip()
column_pc
```



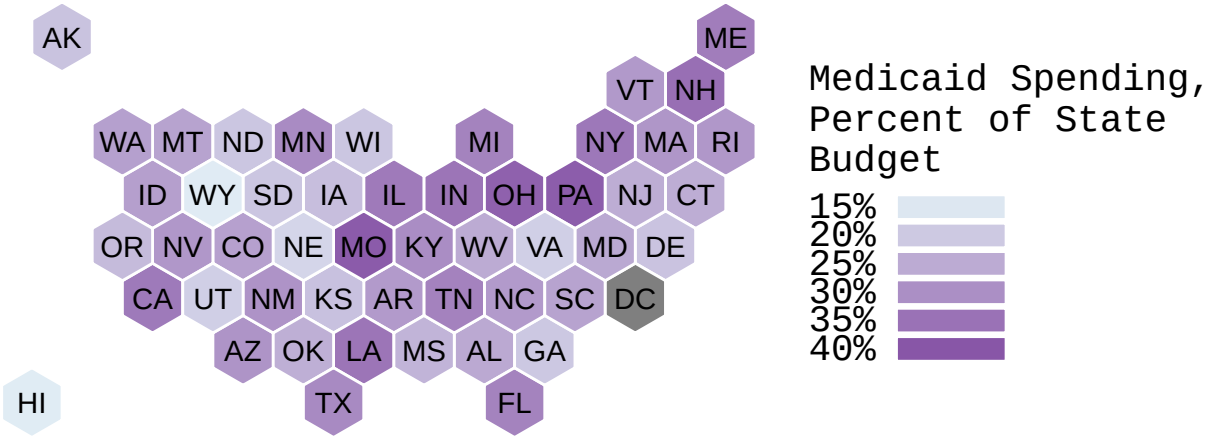
Health Care is a large share of most state budgets

```
library(geojsonio)
spdf <- geojsonio::geojson_read("../Raw Data/us_states_hexgrid.geojson",  what = "sp")
library(broom)
library(cartogram)
library(rgeos)
library(mapproj)
# Read in Medicaid as share of state budget data
healthcare <- read_csv("../Raw Data/HealthCareAsShare.csv")

spdf@data = spdf@data %>% mutate(google_name = gsub(" \\(United States\\)", "", google_name))
spdf@data = spdf@data %>%
  left_join(.,
            healthcare,
            by=c("google_name"="State"))
```

```r
spdf_fortified <- broom::tidy(spdf, region = "google_name")
spdf_fortified <- spdf_fortified %>% left_join(. , healthcare, by=c("id"="State"))
centers <- cbind.data.frame(data.frame(gCentroid(spdf, byid=TRUE), id=spdf@data$iso3166_2))

cartoCustom <- theme(text = element_text(family="Courier New", size=14),
                     legend.text = element_text(size=14),
                     plot.title = element_text(color="black",
                                               size=20,
                                               family="Verdana",
                                               hjust=0),
                     plot.caption = element_text(color="black", size=10, face="italic"),
                     legend.title = element_text(size = 14),
                     plot.subtitle = element_text(size = 14, family = "Courier New"))

ggplot() +
  geom_polygon(data = spdf_fortified, aes(fill = `Medicaid Share`, x = long, y = lat, group = group), c
  geom_text(data=centers, aes(x=x, y=y, label=id)) +
  scale_fill_gradient(name = 'Medicaid Spending,\nPercent of State\nBudget',
                      labels = scales::percent_format(accuracy = 1),
                      low = '#e0ecf4', limits = c(0.141 , 0.4),
                      high = '#8856a7',
                     guide=guide_legend( keyheight = unit(3, units = "mm"),
                                         keywidth=unit(15, units = "mm"),
                                         title.position = 'top',
                                         label.position = "left")) +
  theme_void() +
  cartoCustom +
  labs(title = "Medicaid Makes Up A Large But Varying Portion of State Budgets",
       subtitle = "Figures Represent 2018 Data Compiled by NASBO",
       caption = "National Association of State Budget Officers") +
  coord_map()
```

Medicaid Makes Up A Large But Varying Portio

Figures Represent 2018 Data Compiled by NASBO



National Association of State Budget Officers