Tile Map to depict mortality in the US

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January 15, 2018

This is a reproducible example to produce a tile map that shows mortality rates in the USA.

Libraries

```
library(tidyverse)
library(geofacet)
library(kani)

options(scipen = 99)
```

Data import

We use data from IMHE's website that has gender-specific data about mortality rates due to different causes in the USA and its counties. We will only be dealing with mortality rates due to all causes in all states (present along with the counties) of the US(Including Hawaii and District of Columbia).

```
files <- list.files(pattern = '*.CSV', full.names = T, recursive = T)

mortality <- map_df(files, read_csv)

states <- data.frame(
  state_abb = c(state.abb, "DC"),
  location_name = c(state.name, "District of Columbia")
)

mortality <- mortality %>%
  filter(location_name %in% state.name | location_name == "District of Columbia") %>%
  filter(cause_name == "All causes" & sex == "Both") %>%
  inner_join(states)
```

US Average for each year

```
usa_vs_state <- mortality %>%
  group_by(year_id) %>%
  mutate(usa_avg = mean(mx)) %>%
  ungroup() %>%
  select(
    state = location_name,
    state_abb,
    year = year_id,
    state_avg = mx,
    usa_avg
  ) %>%
```

```
  mutate(
    ribbon_color = case_when(
       state_avg > usa_avg ~ "#f8766d",
      usa_avg > state_avg ~ "#00bfc4"
    ),
    ribbon_value = case_when(
      state_avg > usa_avg ~ state_avg,
      usa_avg > state_avg ~ usa_avg,
      TRUE ~ state_avg
    )
  )
```

To produce the plot, we use the `geom_ribbon` function to show more apparent difference in the state vs the usa average mortality due to all causes

```
# Plot

usa_state_plot <- usa_vs_state %>%
  gather(state_avg, usa_avg, key = "metric", value = "mortality_rate") %>%
  separate(metric, into = c("metric", "avg")) %>%
  select(-avg) %>%
  ggplot(aes(year, mortality_rate, color = metric)) +
  geom_line(size = 1) +
  geom_ribbon(aes(ymin = mortality_rate, ymax = ribbon_value, linetype = NA, fill = ribbon_color), alpha
  facet_geo(~state_abb, grid = "us_state_grid4") +
  scale_fill_identity() +
  theme_kani() +
  theme(
    legend.position = "top",
    legend.margin = margin(b = -1, unit = "cm"),
    plot.background = element_rect(fill = "white"),
    panel.background = element_rect(fill = "white"),
    legend.background = element_rect(fill = "white"),
    legend.key = element_rect(fill = "white"),
    strip.background = element_rect(fill = "white")
  )

ggsave("usa_state_mortality.png", usa_state_plot, height = 12, width = 15)
```

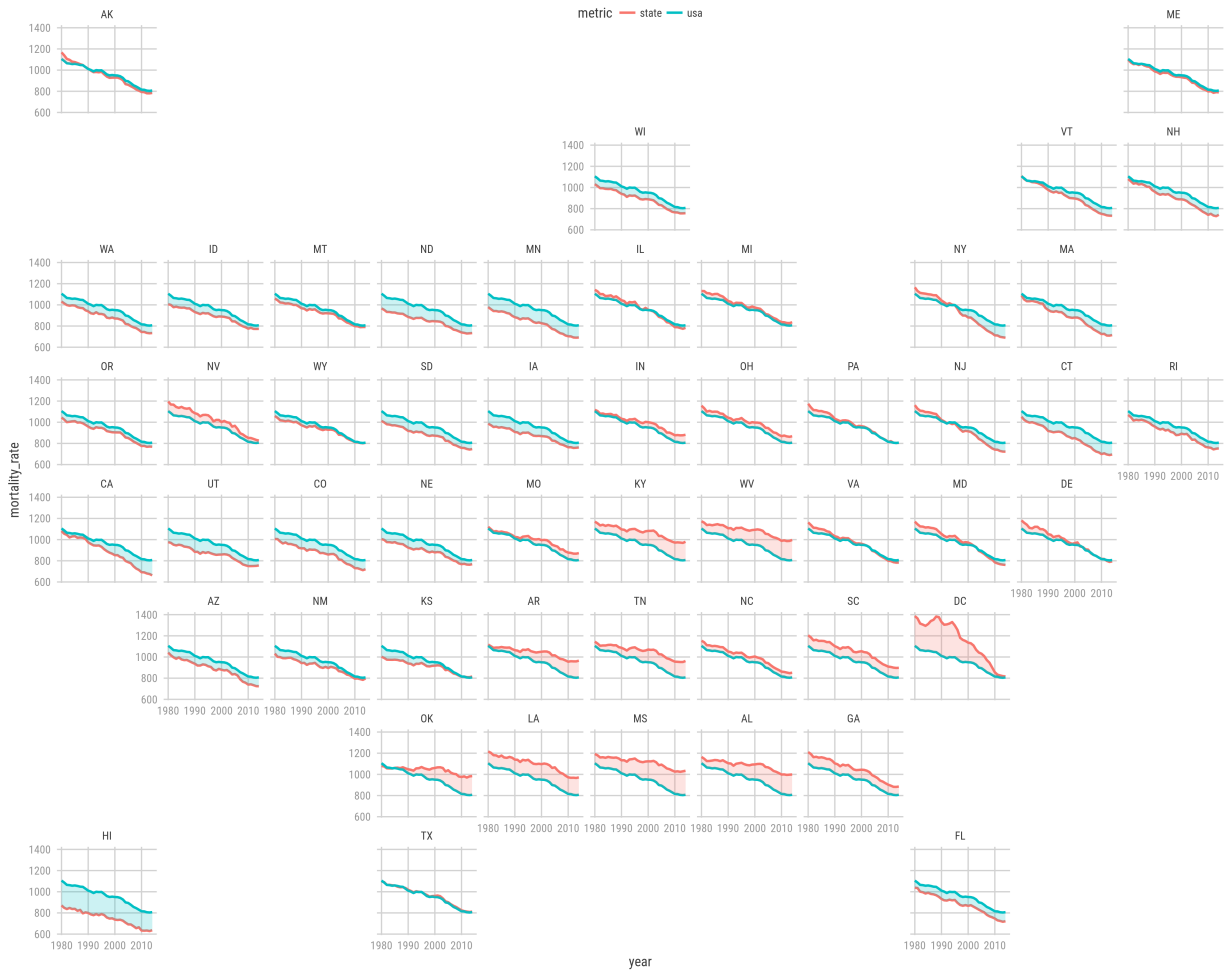

Figure 1: USA vs State Mortality