Refugees

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 # The Set Up ## Load libraries and initial data

```
library(tidyverse)
library(scales)
library(countrycode)
library(lubridate)
library(patchwork)
library(ggflags)
library(RColorBrewer)
library(bbplot)

# Load DHS refugee data
refugees_raw <- read_csv("data/refugee_status.csv", na = c("-", "X", "D"))
```

```
# Create vector of non-countries to filter out
non_countries <- c("Africa", "Asia", "Europe", "North America", "Oceania",
                   "South America", "Unknown", "Other", "Total")

refugees_clean <- refugees_raw %>%
  rename(origin_country = `Continent/Country of Nationality`) %>%
  filter(!(origin_country %in% non_countries)) %>%
  mutate(iso3 = countrycode(origin_country, "country.name", "iso3c",
                            custom_match = c("Korea, North" = "PRK"))) %>%
  mutate(origin_country = countrycode(iso3, "iso3c", "country.name"),
         origin_region = countrycode(iso3, "iso3c", "region"),
         origin_continent = countrycode(iso3, "iso3c", "continent")) %>%
  gather(year, number, -origin_country, -iso3, -origin_region,
         -origin_continent) %>%
  mutate(year = as.numeric(year),
         year_date = ymd(paste0(year, "-01-01")))

# Dataframe with total sum of refugees by country per year
refugees_countries_cumulative <- refugees_clean %>%
  arrange(year_date) %>%
  group_by(origin_country) %>%
  mutate(cumulative_total = cumsum(number))
```

Clean the data

I pivoted wider to be able to calculate the rankings of each country within the 2006-2015 time period. I then sorted each year to determine the top five ranking score so that I could note the top 5 countries of origin of

refugees for each year. I then returned to our tidy dataframe and created a new dataframe with all those countries that ranked in the top 5 over the 2006-2015 time period. And lastly, I saved this newly created dataframe.

```
top_refugees_all <- refugees_countries_cumulative %>%
  filter(year %in% c(2006:2015)) %>%
  drop_na(cumulative_total) %>%
  group_by(year) %>%
  mutate(ranking = rank(cumulative_total)) %>%
  ungroup() %>%
  pivot_wider(names_from = year, names_prefix = "rank_", values_from = ranking)

top_refugee_countries <- top_refugees_all %>%
  select(origin_country, year_date, cumulative_total, rank_2006, rank_2007,
         rank_2008,rank_2009, rank_2010, rank_2011, rank_2012, rank_2013,
         rank_2014, rank_2015) %>%
  filter(rank_2006 >= 49.0 |
         rank_2007 >= 42.0 |
         rank_2008 >= 38.0 |
         rank_2009 >= 37.0 |
         rank_2010 >= 35 |
         rank_2011 >= 35.0 |
         rank_2012 >= 32 |
         rank_2013 >= 30 |
         rank_2014 >=30 |
         rank_2015 >= 28.0)

alltime_refugee <- refugees_countries_cumulative %>%
  filter(origin_country %in% c("Cuba","Iran","Russia","Somalia","Vietnam",
                               "Myanmar (Burma)","Iraq"))

write.csv(alltime_refugee, "alltime_refugees.csv")
```

Import the refined data

Offline, I added the number of refugees granted asylum each year as both a number and proportion to total number of refugees as well as the GDP per capita for each country each year. The number of refugees granted asylym came from the 2015 Yearbook of Immigration Statistics from the Department of Homeland Security. The GDP per capita numbers came from the World Bank's DataBank.

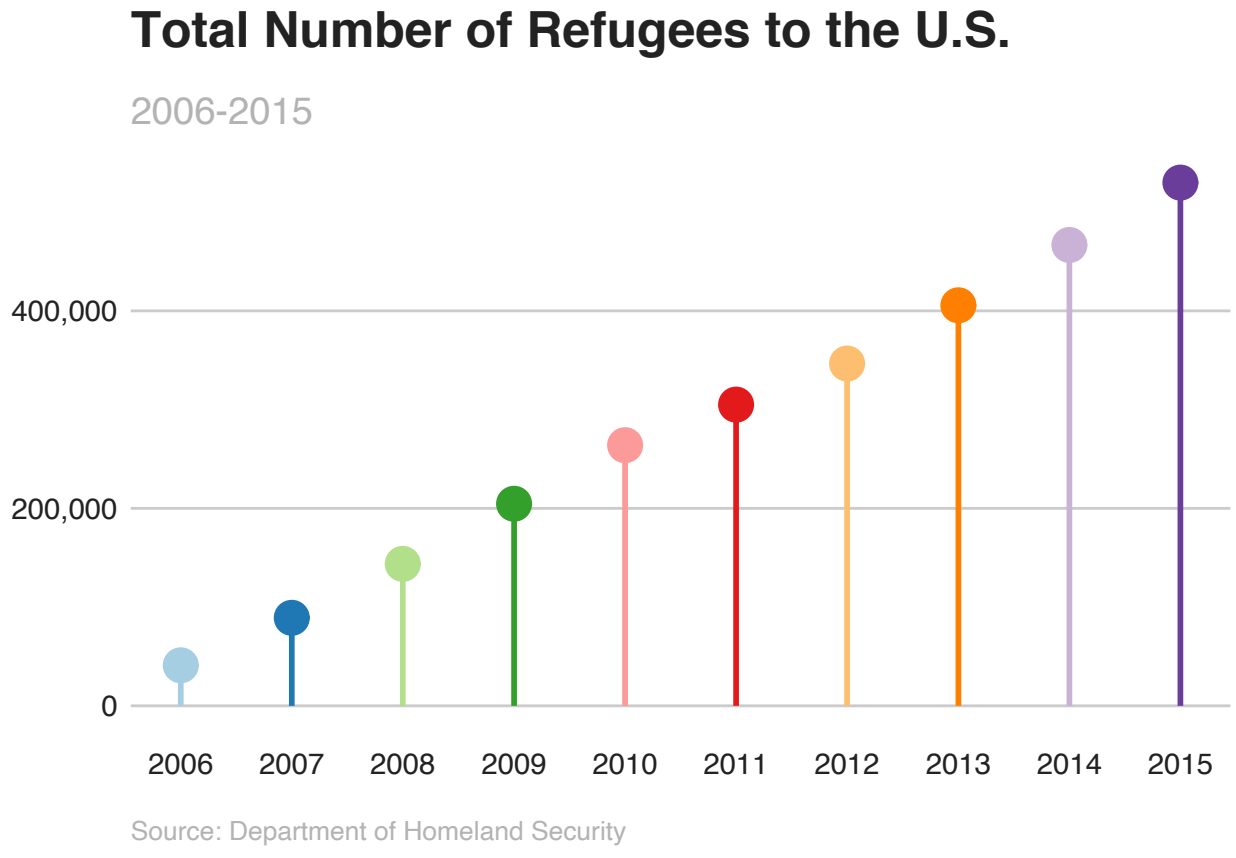
I then imported that dataframe to work with for the visualizations.

```
complete_refugees <- read_csv("data/alltime_complete_refugees.csv")
```

Visualizations of refugee data

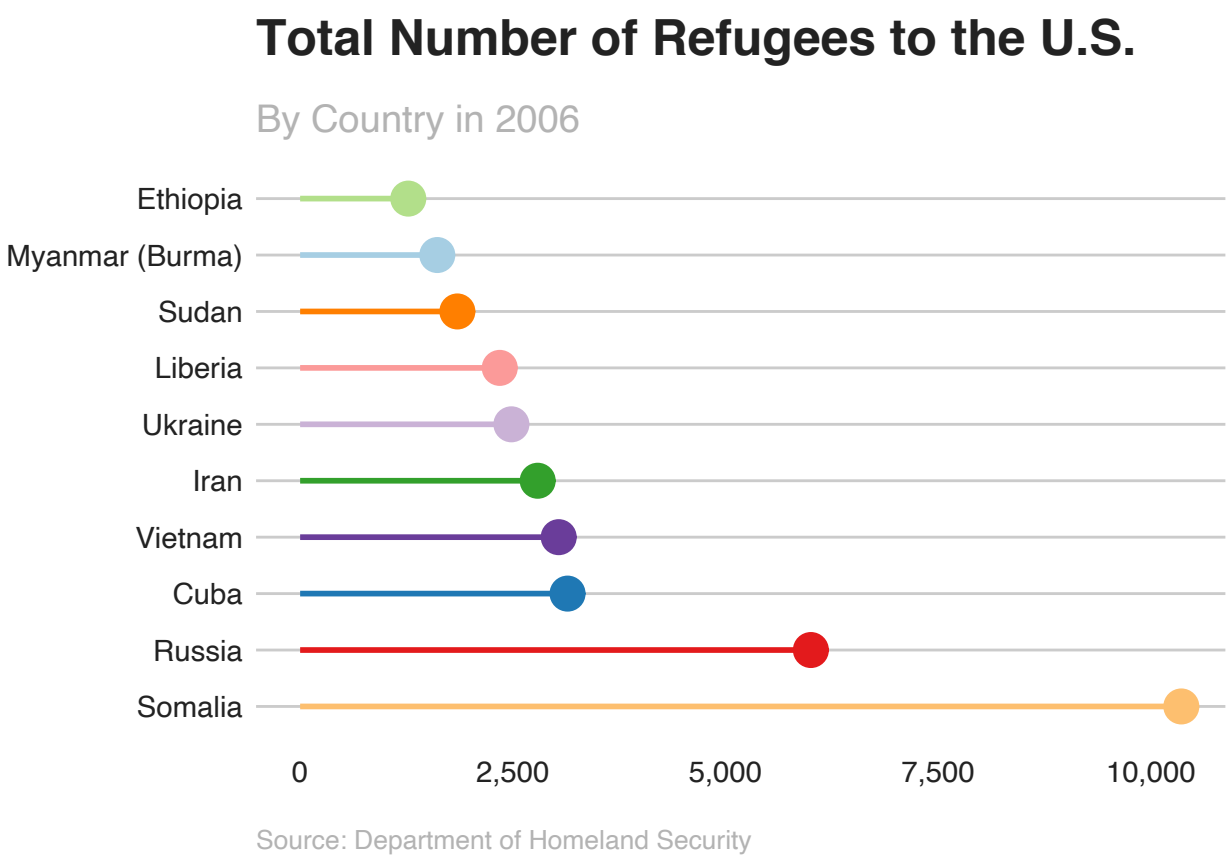
```
total <- refugees_countries_cumulative %>%
  group_by(year_date) %>%
  summarise(total = sum(cumulative_total, na.rm = TRUE))

mypalette <- brewer.pal(10,"Paired")
```

```r
# Total number of refugees over time
total_plot <- ggplot(total,
                     aes(x = year_date, y = total)) +
  geom_pointrange(aes(ymin = 0, ymax = total),
                  fatten = 5, size = 1, col = mypalette) +
  scale_y_continuous(labels = comma) +
  scale_x_date(date_breaks = "1 year", date_labels = "%Y") +
  labs(x = NULL, y = NULL,
       title = "Total Number of Refugees to the U.S.",
       subtitle = "2006-2015",
       caption = "Source: Department of Homeland Security") +
  bbc_style() +
  theme(panel.grid.minor = element_blank(),
        plot.title = element_text(face = "bold", size = rel(1.7)),
        plot.subtitle = element_text(face = "plain", size = rel(1.3),
                                     color = "grey70"),
        plot.caption = element_text(face = "italic", size = rel(0.9),
                                    color = "grey70", hjust = 0),
        axis.text = element_text(size = rel(1)),
        legend.position = "none")

total_plot
```



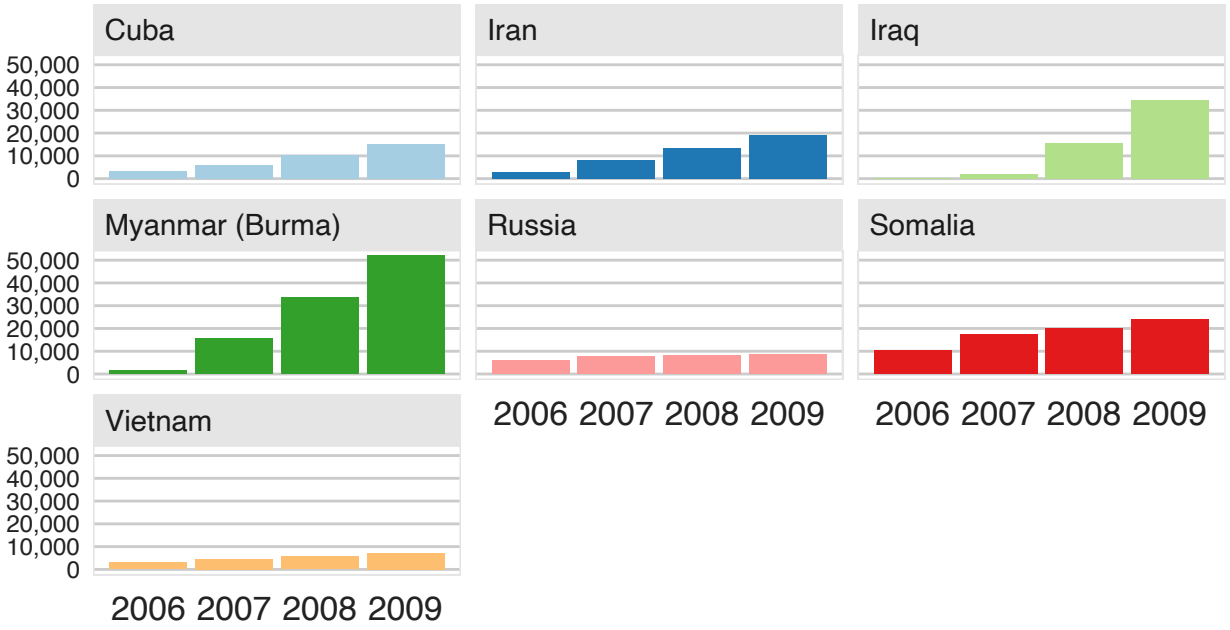
```r
year_2006 <-refugees_countries_cumulative %>%
  filter(year == 2006 & cumulative_total >= 1000)

year_2006$origin_country <- factor(
  year_2006$origin_country, levels = c("Somalia","Russia","Cuba","Vietnam",
                                       "Iran","Ukraine","Liberia",
                                       "Sudan","Myanmar (Burma)","Ethiopia"))
```

```r
year_2006 <- ggplot(year_2006,
                    aes(x = origin_country, y = cumulative_total)) +
  geom_pointrange(aes(ymin = 0, ymax = cumulative_total),
                  fatten = 5, size = 1, col = mypalette) +
  scale_y_continuous(labels = comma) +
  labs(x = NULL, y = NULL,
       title = "Total Number of Refugees to the U.S.",
       subtitle = "By Country in 2006",
       caption = "Source: Department of Homeland Security") +
  bbc_style() +
  theme(panel.grid.minor = element_blank(),
        plot.title = element_text(face = "bold", size = rel(1.7)),
        plot.subtitle = element_text(face = "plain", size = rel(1.3),
                                     color = "grey70"),
        plot.caption = element_text(face = "italic", size = rel(0.9),
                                    color = "grey70", hjust = 0),
        axis.text = element_text(size = rel(1)),
        legend.position = "none") +
  coord_flip()

year_2006
```

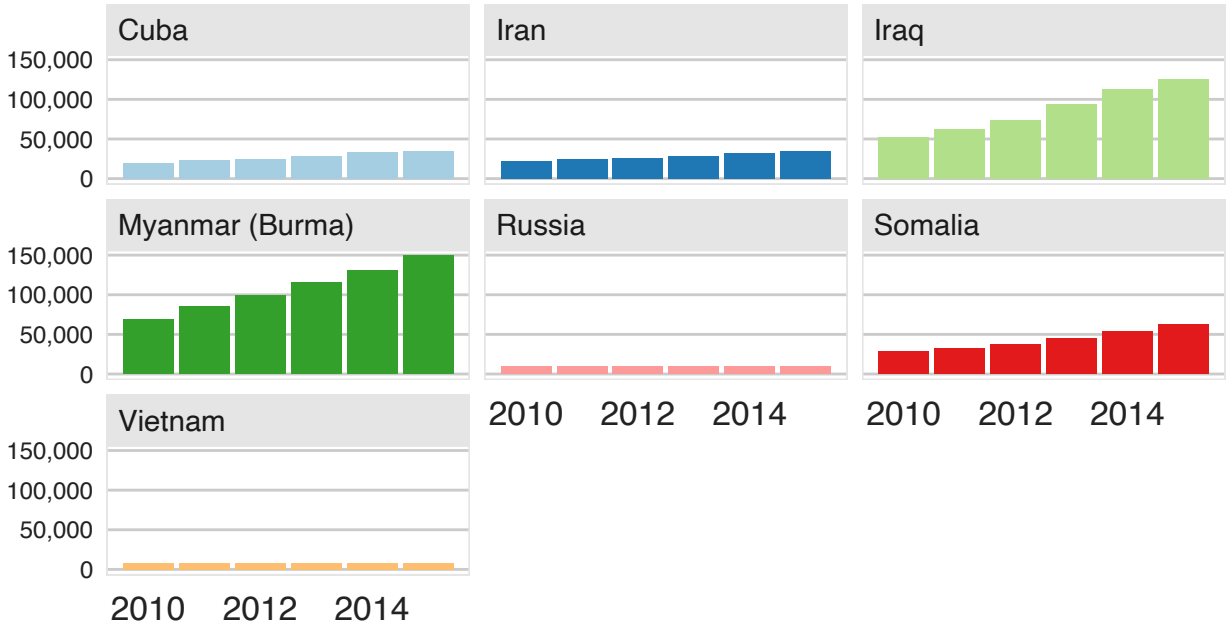



```
years2006_2009 <- complete_refugees %>%
  filter(year %in% c(2006:2009))

years2006_2009_plot <- ggplot(years2006_2009,
                              aes(x = year, y = cumulative_total,
                                  fill = origin_country)) +
  geom_col() +
  scale_fill_brewer(palette = "Paired") +
  scale_y_continuous(labels = comma) +
  facet_wrap(vars(origin_country)) +
  labs(x = NULL, y = NULL,
       title = "Total Number of Refugees to the U.S.",
       subtitle = "By Country, 2006-2009",
       caption = "Source: Department of Homeland Security") +
  bbc_style() +
  theme(panel.grid.minor = element_blank(),
        plot.title = element_text(face = "bold", size = rel(1.7)),
        plot.subtitle = element_text(face = "plain", size = rel(1.3),
                                     color = "grey70"),
        plot.caption = element_text(face = "italic", size = rel(0.9),
                                    color = "grey70", hjust = 0),
        axis.text.x = element_text(size = rel(.7)),
        axis.text.y = element_text(size = rel(.5)),
        strip.text = element_text(size = rel(1), hjust = 0),
        legend.position = "none",
        strip.background = element_rect(fill = "grey90", color = NA),
```

```
        panel.border = element_rect(color = "grey90", fill = NA))

years2010_2015 <- complete_refugees %>%
  filter(year %in% c(2010:2015))

years2010_2015_plot <- ggplot(years2010_2015,
                              aes(x = year, y = cumulative_total,
                                  fill = origin_country)) +
  geom_col() +
  scale_fill_brewer(palette = "Paired") +
  scale_y_continuous(labels = comma) +
  facet_wrap(vars(origin_country)) +
  labs(x = NULL, y = NULL,
       title = "Total Number of Refugees to the U.S.",
       subtitle = "By Country, 2010-2015",
       caption = "Source: Department of Homeland Security") +
  bbc_style() +
  theme(panel.grid.minor = element_blank(),
        plot.title = element_text(face = "bold", size = rel(1.7)),
        plot.subtitle = element_text(face = "plain", size = rel(1.3),
                                     color = "grey70"),
        plot.caption = element_text(face = "italic", size = rel(0.9),
                                    color = "grey70", hjust = 0),
        axis.text.x = element_text(size = rel(.7)),
        axis.text.y = element_text(size = rel(.5)),
        strip.text = element_text(size = rel(1), hjust = 0),
        legend.position = "none",
        strip.background = element_rect(fill = "grey90", color = NA),
        panel.border = element_rect(color = "grey90", fill = NA))

years2006_2009_plot
```



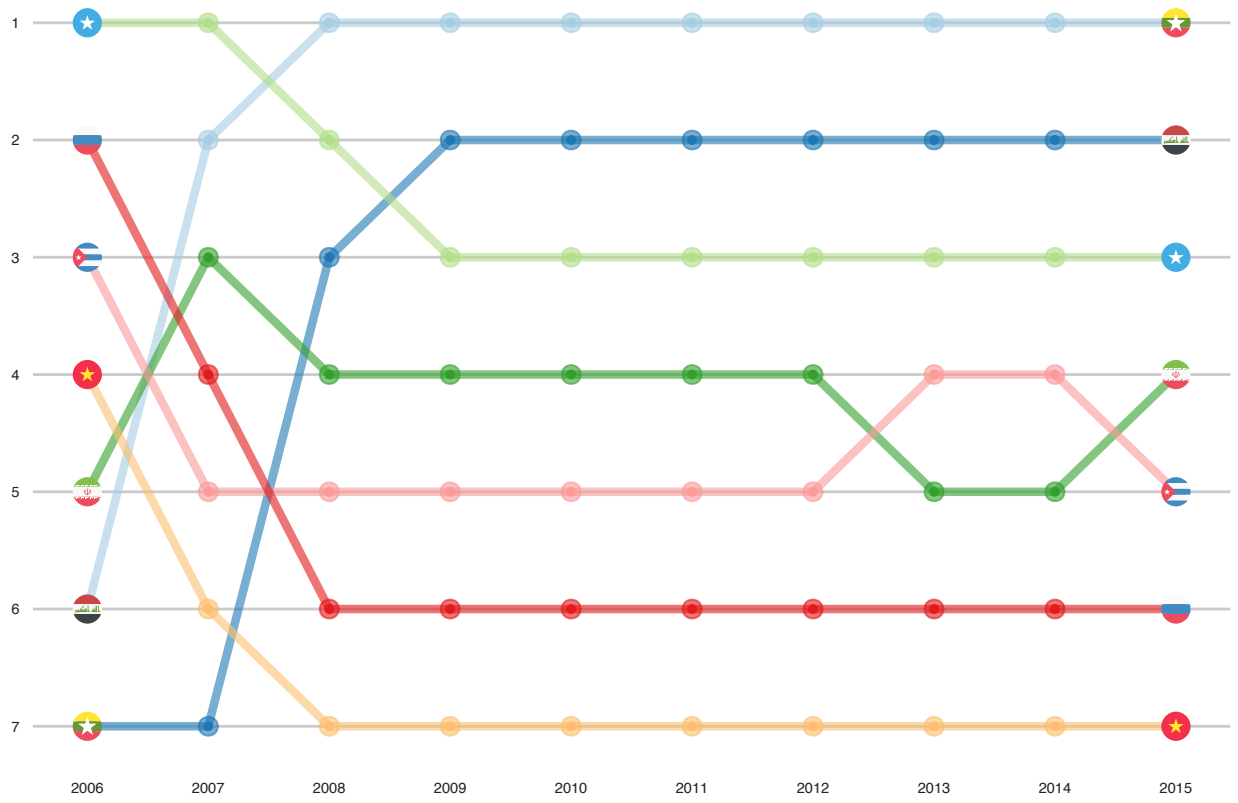

```
years2010_2015_plot
```



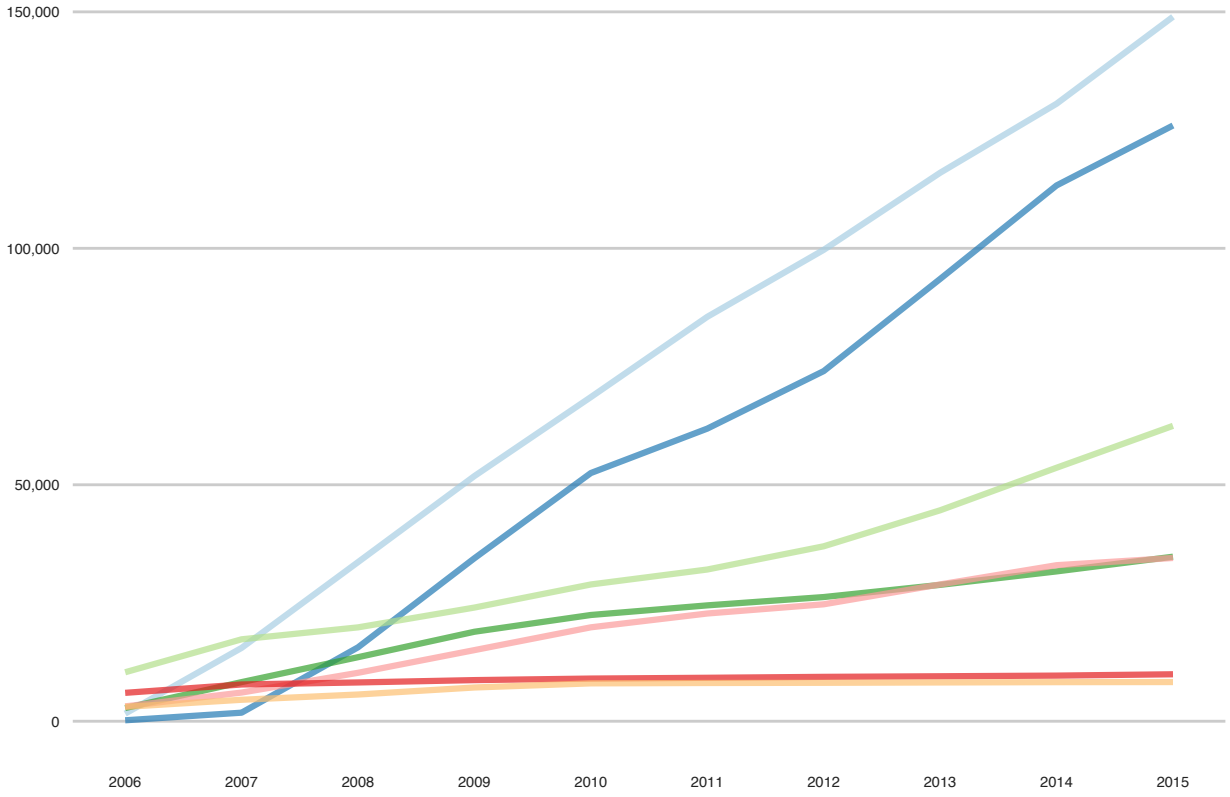

```
complete_refugees$origin_country <- factor(
  complete_refugees$origin_country, levels = c(
    "Myanmar (Burma)","Iraq","Somalia","Iran","Cuba","Russia","Vietnam"))


total_over_time_plot <- ggplot(complete_refugees,
                               mapping = aes(year, cumulative_total,
                                             color = origin_country)) +
  geom_line(size = 1.1, alpha = .7) +
  scale_color_brewer(palette = "Paired") +
  scale_x_continuous(breaks = 2006:2015, minor_breaks = 2006:2015) +
  scale_y_continuous(labels = comma) +
  labs(x = NULL, y = NULL) +
  bbc_style() +
  theme(panel.grid.minor = element_blank(),
        axis.text = element_text(size = rel(.5)),
        legend.position = "none")

ggsave(total_over_time_plot, filename = "outputs/total_over_time_plot.png",
       dpi = 300, type = "cairo",
       width = 4, height = 3, units = "in")

ggsave(total_over_time_plot, filename = "outputs/total_over_time_plot.pdf",
       device = cairo_pdf,
       width = 4, height = 3, units = "in")
```

```r
alltime_rank <- complete_refugees %>%
  group_by(year) %>%
  mutate(rank = dense_rank(desc(cumulative_total)))

country_flags_start <- data.frame(
  x = 2006, y = 1:7,
  country = c("so","ru","cu","vn","ir","iq","mm"),
  stringsAsFactors = FALSE)

country_flags_end <- data.frame(
  x = 2015, y = 1:7,
  country = c("mm","iq","so","ir","cu","ru","vn"),
  stringsAsFactors = FALSE)
```

```r
rankings_plot <- ggplot(alltime_rank,
                        aes(x = year, y = rank, color = origin_country)) +
  geom_line(alpha = .6, size = 1.5) +
  geom_point(size = 1) +
  geom_point(alpha = .6, size = 3) +
  geom_point(size = 1) +
  scale_color_brewer(palette = "Paired") +
  scale_y_reverse(breaks = 1:7) +
  scale_x_continuous(breaks = 2006:2016, minor_breaks = 2006:2016) +
  geom_flag(data = country_flags_start,
            aes(x = x, y = y, country = country, size = 1),inherit.aes = FALSE) +
  geom_flag(data = country_flags_end,
            aes(x = x, y = y, country = country, size = 1),inherit.aes = FALSE) +
  theme(legend.position = "none") +
  labs(x = NULL,
       y = NULL) +
  bbc_style() +
  theme(panel.grid.minor = element_blank(),
        axis.text = element_text(size = rel(.5)),
        legend.position = "none")

ggsave(rankings_plot, filename = "outputs/rankings_plot.png",
       dpi = 300, type = "cairo",
       width = 4, height = 3, units = "in")

ggsave(rankings_plot, filename = "outputs/rankings_plot.pdf",
       device = cairo_pdf,
       width = 4, height = 3, units = "in")

rankings_plot
```




```
total_over_time_plot
```


150,000
100,000
50,000
0
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015