

Data Visualization for Policy Analysis: Assignment 2

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Theme

```
#set theme for all plots

my_theme <- theme(plot.background = element_rect(fill="#F4F4F4"),
  plot.margin=unit(c(1,1,1,1),"cm"),
  plot.caption = element_text(family="Montserrat Light", size=6,
    margin=margin(t=20)),
  plot.title = element_text(family="Montserrat", face="bold", size=15),
  plot.subtitle = element_text(family="Courier New"),

  panel.background = element_rect(fill = "#F4F4F4"),
  panel.grid.major.y = element_line(color="black", size=0.25),
  panel.grid.minor.y = element_line(color="black", size=0.25),
  panel.grid.minor.x=element_blank(),
  panel.grid.major.x=element_blank(),

  legend.background = element_rect(fill="#F4F4F4"),
  legend.key = element_blank(),
  legend.title = element_text(family="Montserrat", size=10),
  legend.text = element_text(family="Courier New", size=8),

  axis.ticks.y = element_blank(),
  axis.ticks.x = element_blank(),
  axis.text = element_text(family="Montserrat Light", size=7),
  axis.text.x = element_text(angle = 45, hjust = 1, margin=margin(t=-10)),
  axis.title = element_text(family="Montserrat", size=8),
  axis.title.x = element_text(margin=margin(t=15)),
  axis.title.y = element_text(margin=margin(r=15)))
```

Plot 1

```
ggplot(victim_services, aes(x=year, y=percentage, color=victimservices)) +

  geom_line(size=1) +

  labs(y = "Number of Countries Providing Victim Services", x = "Year",
    title="Majority of countries fail to provide \nservices for victims",
    subtitle="Countries providing services for victims \nof human trafficking, 2000-2011",
    caption="Source: Human Trafficking Indicators, 2000-2011 (Harvard Dataverse)") +

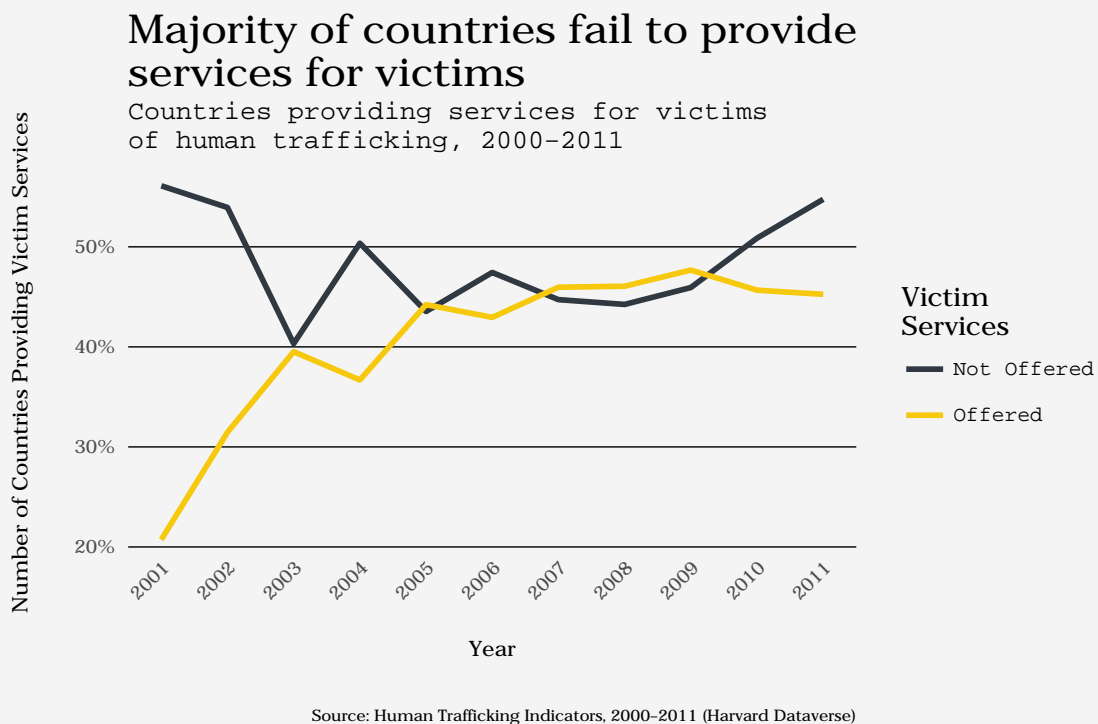
  scale_color_manual(name="Victim\nServices",
    values=c("#303841", "#F6C90E"),
    labels=c("Not Offered", "Offered")) +
```

```
my_theme +

theme(panel.grid.minor.y = element_blank(),
      axis.text.x = element_text(angle = 45, hjust = 1, margin=margin(t=-2))) +

scale_x_continuous(breaks=seq(2001,2011),
                  labels=seq(2001,2011)) +

scale_y_continuous(breaks=c(0.1, 0.2, 0.3, 0.4, 0.5, 0.6),
                  labels=c("10%", "20%", "30%", "40%", "50%", "60%"))
```



The initial sharp increase in countries providing services for victims of human trafficking may be a result of the adoption of the United Nations adoption of the *Palermo Protocol to Prevent, Suppress and Punish Trafficking in Persons, especially Women and Children* in 2000. Up until this point, human trafficking had not been formally defined on the international stage. However, even 17 years following its adoption, most countries continue to lack services for victims. It is yet unclear as to why recent years have demonstrated somewhat of a plateau – or perhaps even a reversal – in progress on this front.

Plot 2

```
ggplot(origin_entry, aes(x=region, fill=origin_region)) +

geom_bar(aes(y = (..count..) / sum(..count..))) +

labs(y = "Percentage of Cases", x = "Point of Entry to the United States",
```

```

title=paste("Majority of U.S. cases involve Latin American \nand Caribbean victims ",
            "transported to the \nU.S. via the southern border", sep=""),
subtitle="International trafficking flows to the United States",
caption="Source: www.HumanTraffickingData.org") +

scale_fill_manual(name="Country of Origin",
                  values=c("#303841", "#F6C90E", "#40616d", "#9A9B94", "#EA9215"),
                  labels=c("East Asia & Pacific", "Europe & Central Asia",
                           "Latin America & Caribbean", "North America",
                           "Sub-Saharan Africa")) +

my_theme +

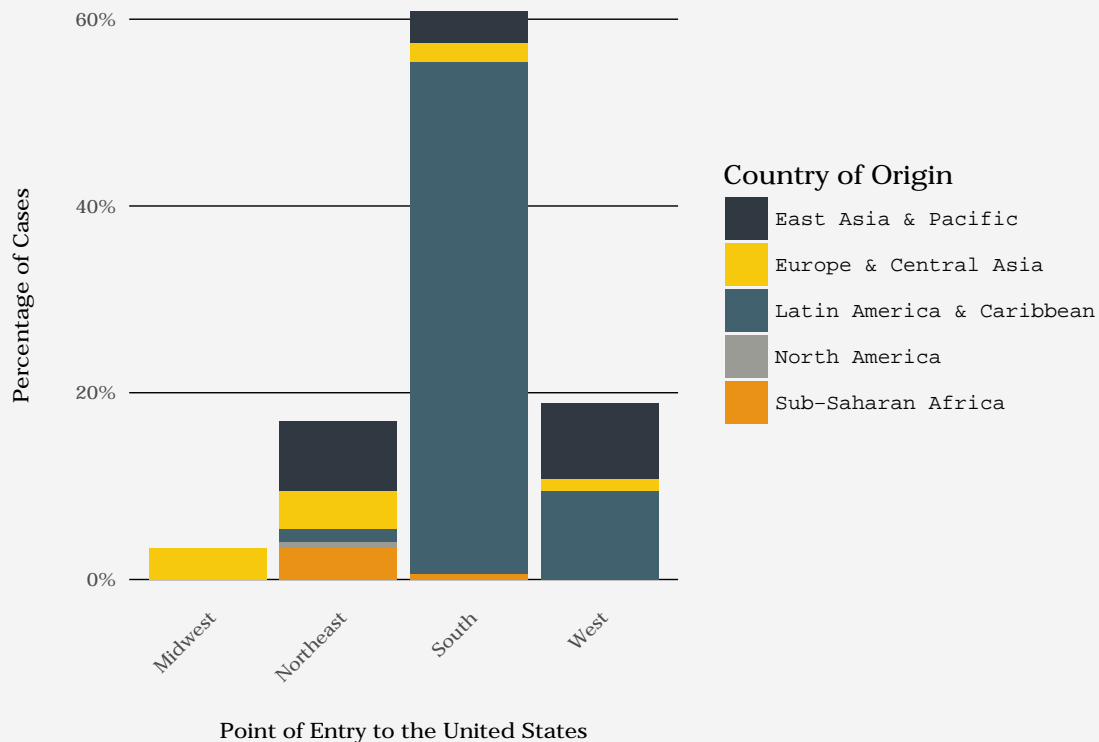
theme(panel.grid.minor.y = element_blank(),
      axis.text.x = element_text(margin=margin(t=-2))) +

scale_x_discrete(labels=c("Midwest", "Northeast", "South", "West")) +
scale_y_continuous(labels = c("0%", "20%", "40%", "60%"),
                   breaks = c(0, 0.2, 0.4, 0.6))

```

Majority of U.S. cases involve Latin American and Caribbean victims transported to the U.S. via the southern border

International trafficking flows to the United States



Source: www.HumanTraffickingData.org

HumanTraffickingData.org documents 869 human trafficking lawsuits over the source of the past two decades, involving 7,050 victims. Approximately 20% of those lawsuits involved foreign victims – comprising 66% of the 7,050 total victims. Many of these victims come from Latin America and the Caribbean. Among the victims whose entry point into the United States is known (which is not always the case), nearly 70% were forced into the U.S. via the southern border. A variety of legal and illegal methods are utilized in order to do so, including smuggling, legal visas, and fake identification.

Plot 3

```
ggplot(combined, aes(x=hdi_score, y=ht_index)) +
  geom_jitter(aes(color=region, size=prosecutions), alpha=0.75) +
  geom_smooth(se=FALSE, color="black") +

labs(y = "Human Trafficking Index (15 = best score)", x = "Human Development Index (1=best score)",
      title="Local quality of life associated with stronger \nanti-trafficking policies",
      subtitle="Human trafficking & human development",
```

```

caption="Source: '3P' Anti-trafficking Policy Index & U.N. Human Development Index") +

my_theme +

theme(plot.subtitle = element_text(family="Courier New", margin=margin(b=10)),
      panel.grid.minor.y = element_blank(),
      legend.position = "bottom",
      legend.direction = "vertical",
      axis.text.x = element_text(angle = 45, hjust = 1, margin=margin(t=-10)),
      axis.title = element_text(family="Montserrat", size=8)) +

scale_color_manual(name="Region",
                   values=c("#303841", "#F6C90E", "#40616d", "#141607",
                           "#9A9B94", "#7d8b2e", "#EA9215"),
                   labels=c("East Asia & Pacific", "Europe & Central Asia",
                           "Latin America & Caribbean", "Middle East & North Africa",
                           "North America", "South Asia", "Sub-Saharan Africa")) +

scale_size_continuous(range=c(1,10), name="Number of Prosecutions \n(2000-2011)") +

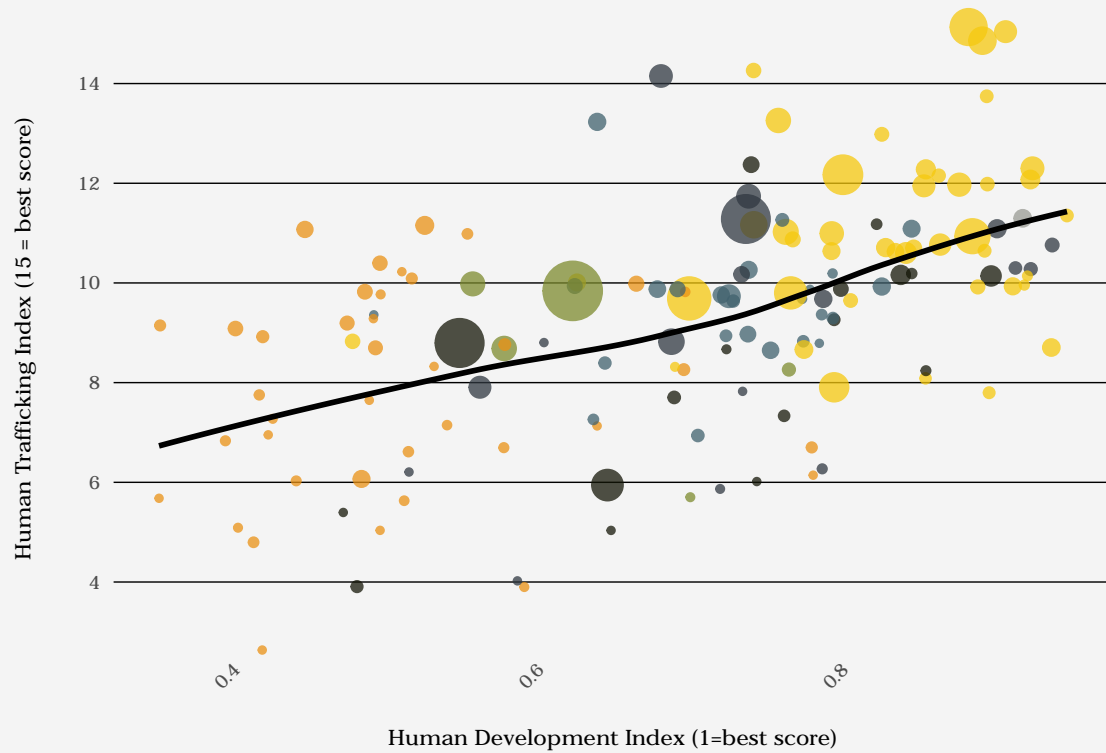
scale_y_continuous(breaks=c(4,6,8,10,12,14),
                   labels=c(4,6,8,10,12,14)) +

scale_x_continuous(breaks=seq(0,1,by=0.2),
                   labels=seq(0,1,by=0.2))

```

Local quality of life associated with stronger anti-trafficking policies

Human trafficking & human development



Number of Prosecutions
(2000-2011)



Region

- East Asia & Pacific
- Europe & Central Asia
- Latin America & Caribbean
- Middle East & North Africa
- North America
- South Asia
- Sub-Saharan Africa

Source: '3P' Anti-trafficking Policy Index & U.N. Human Development Index

The **3P Anti-trafficking Policy Index** was developed through the European Union, and aims to quantify the extent to which each country adheres to the requirements set forth by the United Nations *Palermo Protocol to Prevent, Suppress and Punish Trafficking in Persons, especially Women and Children*. Countries are given a score ranging from 1 (no compliance) to 5 (full compliance) on each of the following dimensions, for a total possible score of 15:

- Prosecution of perpetrators of human trafficking
- Prevention of human trafficking
- Protection of human trafficking victims

The **Human Development Index** was developed by the United Nations, and evaluates life expectancy at birth, average years of schooling, and gross national income per capita.

The tracking between these two indices may suggest that those countries with the resources to foster strong HDI scores are better equipped to comply with the Palermo Protocol. However, the variability in this trend is perhaps more interesting: why would two countries with similar HDI scores – even two countries in the same global region – differ in their willingness or ability to properly address human trafficking?

Plot 4

```
ggplot(filter(traf, defendant_race != "indian" & defendant_race != "other")) +

  geom_boxplot(aes(x=judge_race, y=total_sentence, fill=judge_race),
               width=0.75, outlier.shape=NA) +

  geom_boxplot(aes(x=defendant_race, y=total_sentence, fill=defendant_race),
               width=0.75, outlier.shape=NA) +

  labs(y = "Length of Prison Sentence (years)",
       title=paste("In human trafficking cases, Black defendants",
                    "\nreceive the longest sentences while ",
                    "Asian \njudges deliver the longest sentences", sep=""),
       subtitle="Varying prison stays for perpetrators of human trafficking",
       caption="Source: www.HumanTraffickingData.org") +

  scale_fill_manual(name="Judge Race",
                    values=c("#262c33", "#546373", "#b3920a", "#f2c60e",
                              "#7f807a", "#bebfb6", "#bf7711", "#ff9f17"),
                    labels=c("Asian Defendant", "Asian Judge", "Black Defendant",
                              "Black Judge", "Hispanic Defendant", "Hispanic Judge",
                              "White Defendant", "White Judge")) +

  my_theme +

  theme(legend.position = "none",
        axis.title.x = element_blank()) +

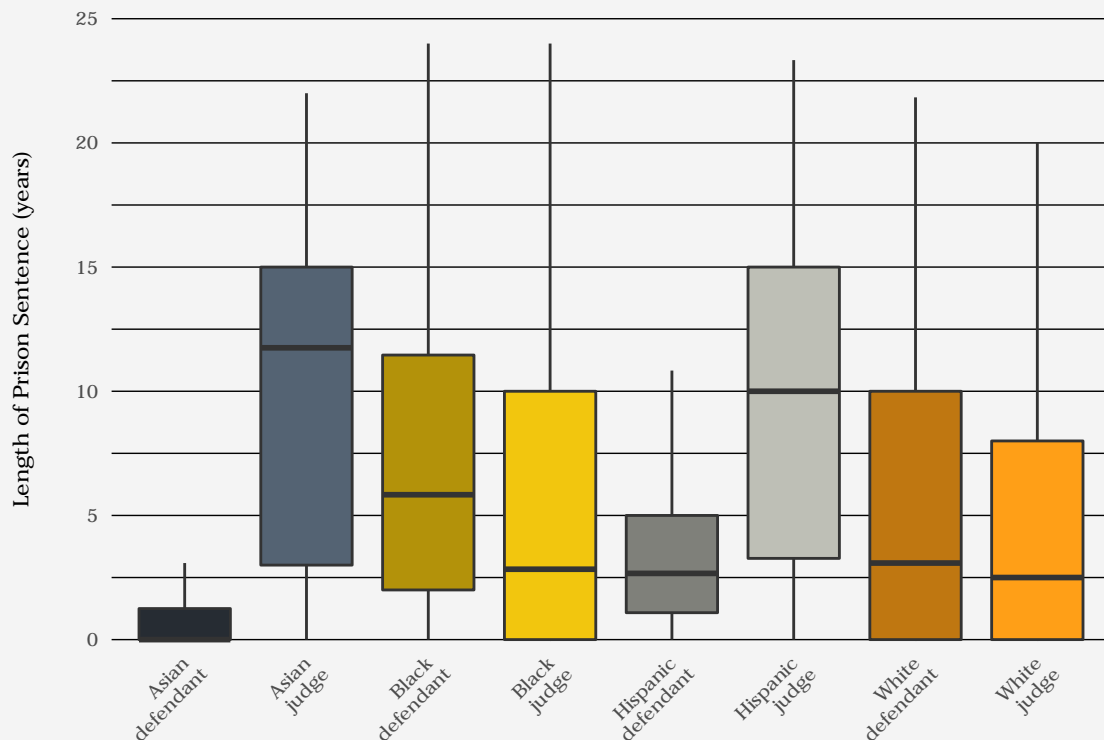
  scale_y_continuous(limits=c(0, 25)) +

  guides(fill=guide_legend(keywidth=0.5, keyheight=1, default.unit="cm")) +

  scale_x_discrete(labels=c("Asian \ndefendant", "Asian \njudge",
                            "Black \ndefendant", "Black \njudge",
                            "Hispanic \ndefendant", "Hispanic \njudge",
                            "White \ndefendant", "White \njudge"))
```

In human trafficking cases, Black defendants receive the longest sentences while Asian judges deliver the longest sentences

Varying prison stays for perpetrators of human trafficking



Source: www.HumanTraffickingData.org

Perpetrators of any crime should receive similar sentences regardless of their own race or that of their judge. This doesn't appear to be the case for human trafficking. While the lengthier sentences received by Black defendants may be the result of the same racial bias that affects sentencing for other crimes, the variation in sentencing based on the race of the judge is perhaps more unusual. Asian and Hispanic judges have delivered sentences that are more than twice as long on average as those delivered by White and Black judges. While the explanation for this is yet unknown, it is possible that Asian and Hispanic judges are more sympathetic to large numbers of Asian and Hispanic victims.

Plot 5

```
ggplot(filter(case_loc, !is.na(region)), aes(x=region, fill=trafficking_type)) +
  geom_bar(aes(y = (.count..)), position="dodge") +
  coord_flip() +

  labs(y = "Number of Cases (2000-2016)", x = "U.S. Region",
       title=paste("Human Trafficking prosecutions \nmost common in the South ",
```



```

    "and \nfor sex trafficking of minors", sep=""),
  subtitle="Human trafficking cases by region and type",
  caption="Source: www.HumanTraffickingData.org") +

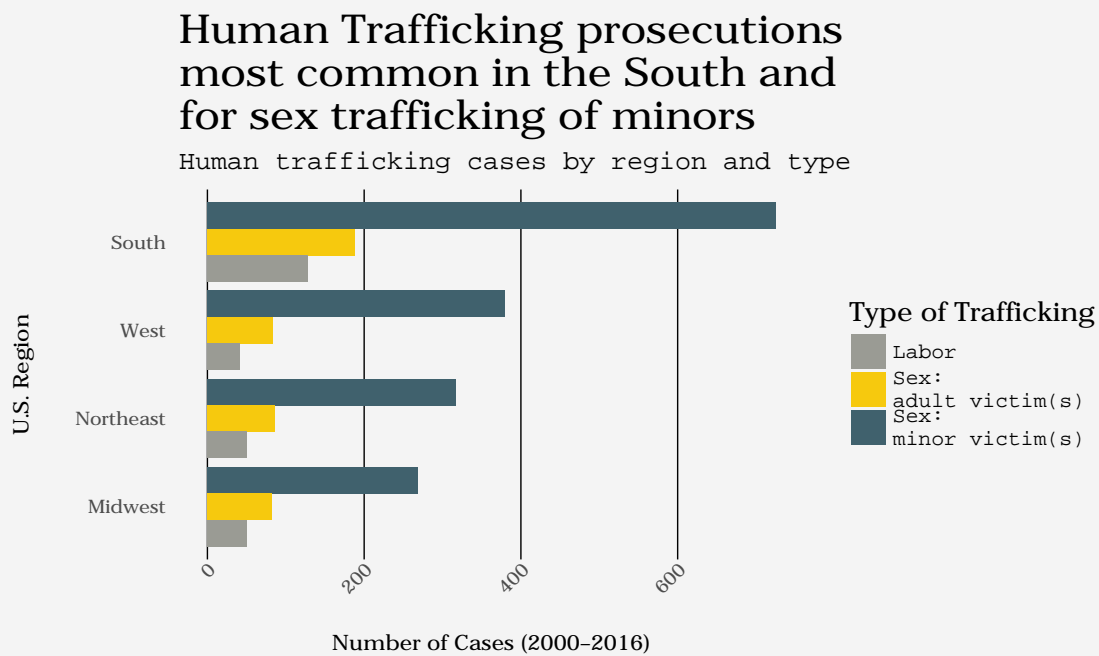
scale_fill_manual(name="Type of Trafficking",
  values=c("#9A9B94", "#F6C90E", "#40616d"),
  labels=c("Labor", "Sex: \nadult victim(s)",
    "Sex: \nminor victim(s)")) +

my_theme +

theme(panel.grid.major.x = element_line(color="black", size=0.25),
  panel.grid.minor.y=element_blank(),
  panel.grid.major.y=element_blank(),
  axis.text.x = element_text(margin=margin(t=-2))) +

guides(fill=guide_legend(keywidth=0.5, keyheight=0.5, default.unit="cm")) +
scale_x_discrete(labels=c("Midwest", "Northeast", "West", "South"))

```



Source: www.HumanTraffickingData.org

With a large majority of foreign victims entering the U.S. through the south, it makes sense that the largest number of human trafficking lawsuits has occurred in the south. However, the fact that sex trafficking cases greatly outnumber labor trafficking cases may be problematic. A 2005 study by the International Labour Organization found that less than half of worldwide trafficking victims are victims of sex trafficking. Either the U.S. diverges from that trend, or labor trafficking cases are not making their way to the courts for one reason or another.