

Assignment 3: Original Visualization 1; Tile Plot

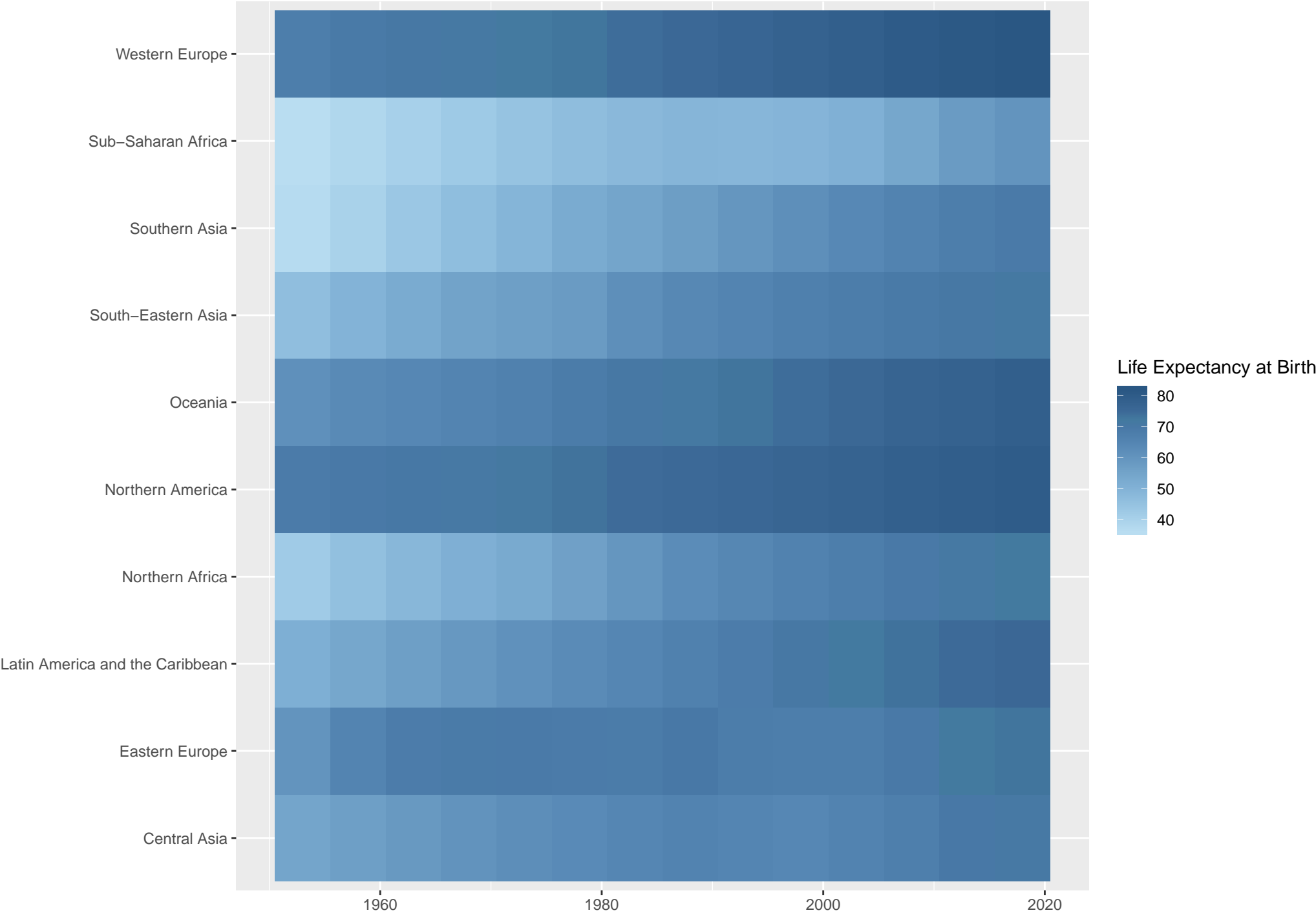
This first visualization shows the change in average life expectancy at birth across the major regions of the world. This tile plot demonstrates two key facts: first, average life expectancy has increased across all regions between 1950 and 2018; second, despite these increases, there remains significant variation in life expectancy across regions. Life expectancy in the Global North reached an average of 80 years as early as the late 1980s, while life expectancy is still under 50 in Sub-Saharan Africa. This visualization should impress upon its' audience the need to continue global health initiatives to address this glaring inequality.

Illustrator Training

As of the writing of this assignment, I have not yet completed the Adobe Illustrator training. Even so, I downloaded the software and attempted to use it on the second visualization (line graph). I did not use it for the first visualization.

An Ageing World

Since 1950, average life expectancy has steadily increased across the world. However, significant disparities between regions remain.



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```
### Data Visualization Assignment 3.1 ###
```

```
# Connor Harrison, Feb 24, 2019 #
```

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```

```
# Require Packages
```

```
library(tidyverse)
```

```
library(readr)
```

```
library(ggthemes)
```

```
# Load Data
```

```
WPP2017_LifeTable <- read_csv("~/Georgetown Docs/Data/WPP2017_LifeTable.csv")
```

```
# Only keep aggregated gender observations
```

```
life_table2 <- filter(WPP2017_LifeTable, Sex=="Total")
```

```
# Infant Mortality Measure: Keep obs where age range is 0-1
```

```
life_table_child <- filter(life_table2, AgeGrp==0)
```

```
# Drop Projections
```

```
life_table_child_p <- filter(life_table_child, MidPeriod<2019)
```

```
# Keep only region aggregated variables
```

```
life_table_child_region_p <- filter(life_table_child_p, Location=="Africa" | Location=="Asia" |  
Location=="Caribbean"
```

```
                                | Location=="Central America" | Location=="Central Asia" | Location=="Eastern  
Africa"
```

```
                                | Location=="Eastern Asia" | Location=="Eastern Europe" | Location=="Europe" |
```

```
                                Location=="High Income Countries" | Location=="Latin America and the  
Caribbean"
```

```

| Location=="Least developed countries" | Location=="Less developed regions" |
  Location=="Less developed regions, excluding China" | Location=="Low-income
countries"

| Location=="Lower-middle-income countries" | Location=="Middle Africa" |
  Location=="Middle-income countries" | Location=="Northern Africa" |
Location=="Northern America"

| Location=="South America" | Location=="South-Central Asia" | Location=="South-
Eastern Asia"

| Location=="Sub-Saharan Africa" | Location=="Upper-middle-income countries" |
  Location=="Western Europe" | Location=="World" | Location=="Oceania" |
Location=="Southern Asia")

```

Refine life tables to selected regions and income categories

```

life_table_child_region2 <- filter(life_table_child_region_p, Location=="Central Asia" |
Location=="Southern Asia" | Location=="South-Eastern Asia" |

  Location=="Northern Africa" | Location=="Sub-Saharan Africa" |
Location=="Western Europe" |

  Location=="Eastern Europe" | Location=="Northern America" | Location=="Latin
America and the Caribbean" |

  Location=="Oceania")

```

Rename Variables Based on Codebook

```

life_table_child_region2 <- select(life_table_child_region2, Region='Location', Year='MidPeriod',
Central_Death_Rate='mx',

  Prob_Dying='qx', Prob_Surviving='px', Number_Deaths='dx', Survival_Ratio='Sx',
  Expectation_of_Life='ex')

```

Tile Plot

```

ggplot(data = life_table_child_region2,
  mapping = aes(x = Year, y = Region)) +
  geom_tile(aes(fill = Expectation_of_Life)) +
  ggthemes::scale_fill_continuous_tableau() +

```

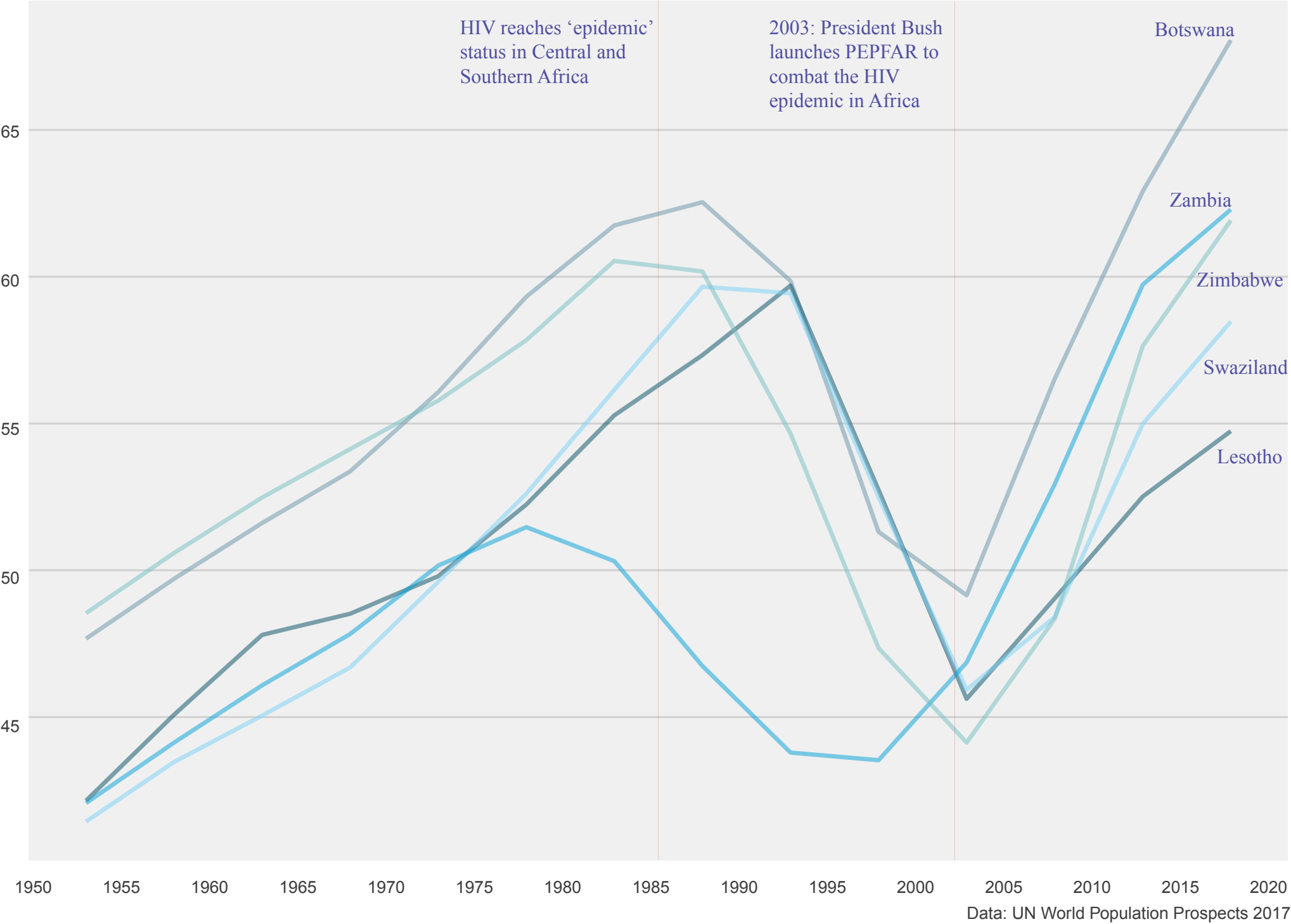
```
theme(plot.title = element_text(face = "bold")) +  
labs(fill="Life Expectancy at Birth",  
      x="", y="",  
      title = "An Ageing World",  
      subtitle = "Since 1950, average life expectancy has steadily increased across\nthe world. However,  
significant disparities between regions remain.",  
      caption = "Data: UN World Population Prospects 2017")
```

Assignment 3: Original Visualization 1; Tile Plot

This visualization shows the impact of the HIV epidemic on five Sub-Saharan African nations; Botswana, Lesotho, Swaziland, Zambia, and Zimbabwe. These five nations were chosen for this visualization because at the peak of the crisis, each of these countries had an adult HIV infection rate over 20%. The first cases of HIV were reported in Central Africa in the early 1960s and spread rapidly, hitting East and Southern Africa the hardest. By 1986, the WHO officially declared HIV as an ‘epidemic’, by which time the virus had progressed from the initial ‘dormancy’ phase to active infection, following which life expectancy dropped sharply in the region. In 2003, President George W. Bush launched the PEPFAR initiative to combat the epidemic through large expenditures to fund treatment, prevention, and awareness campaigns. PEPFAR is widely considered to be one of the most successful foreign aid initiatives of all time, and this visualization demonstrates the impact of the program on life expectancy of affected countries.

The HIV Epidemic in Africa

Impact of HIV on Life Expectancy in 5 Nations



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```
### Data Visualization Assignment 3.2 ###
```

```
# Connor Harrison, Feb 24, 2019 #
```

```
#####
```

```
# Require Packages
```

```
library(tidyverse)
```

```
library(readr)
```

```
library(ggthemes)
```

```
# Load Data
```

```
WPP2017_LifeTable <- read_csv("~/Georgetown Docs/Data/WPP2017_LifeTable.csv")
```

```
# Only keep aggregated gender observations
```

```
life_table2 <- filter(WPP2017_LifeTable, Sex=="Total")
```

```
# Infant Mortality Measure: Keep obs where age range is 0-1
```

```
life_table_child <- filter(life_table2, AgeGrp==0)life_table2 <- filter(WPP2017_LifeTable, Sex=="Total")
```

```
# Life Table for Highly-affected HIV nations
```

```
life_table_hiv <- filter(life_table2, Location=="Lesotho" | Location=="Botswana" |  
Location=="Swaziland"
```

```
  | Location=="Zambia" | Location=="Zimbabwe")
```

```
# Pull out specific age and range period
```

```
life_table_hiv_p <- filter(life_table_hiv, AgeGrp==0 & MidPeriod < 2019)
```

```
# Rename Variables Based on Codebook
```



```

life_table_hiv_p <- select(life_table_hiv_p, Region='Location', Year='MidPeriod',
Central_Death_Rate='mx',

                          Prob_Dying='qx', Prob_Surviving='px', Number_Deaths='dx', Survival_Ratio='Sx',

                          Expectation_of_Life='ex')

# Initial Plot

ggplot(data = life_table_hiv_p,

       mapping = aes(x = Year, y = Expectation_of_Life, color = Region)) +

geom_line()

# Plot

ggplot(data = life_table_hiv_p,

       mapping = aes(x = Year, y = Expectation_of_Life, color = Region)) +

geom_line(size=1.2, alpha=0.5) +

scale_x_continuous(breaks = seq(1950, 2020, 5)) +

scale_y_continuous(breaks = seq(40, 65, 5)) +

theme_fivethirtyeight() +

theme(legend.position = 'none', panel.grid.major.x = element_blank(), panel.border = element_blank())
+

scale_colour_economist() +

labs(fill="",

      x="", y="",

      title = "The HIV Epidemic",

      subtitle = "Impact of HIV on Life Expectancy in 5 African Nations",

      caption = "Data: UN World Population Prospects 2017")

## Visualization Refined in Illustrator ##

# (somewhat) #

```