Analysis

Analysis Overview:

This analysis seeks to explore and compare Turkey's demographic indicators with those of more developed and less developed regions, based on data provided by the UN Demographic Indicators Dataset. By examining critical parameters such as total deaths, crude death rates, and fertility trends, we aim to gain valuable insights into Turkey's demographic status in relation to other regions with varying levels of development.

We will examine these indicators over time to assess whether Turkey's demographic patterns are more aligned with developed countries, which generally experience better healthcare outcomes, or with less developed countries, where healthcare access may be limited, resulting in different development trends.

Analysis Of Birth Rate Among Women Aged 15-19 Over The Years

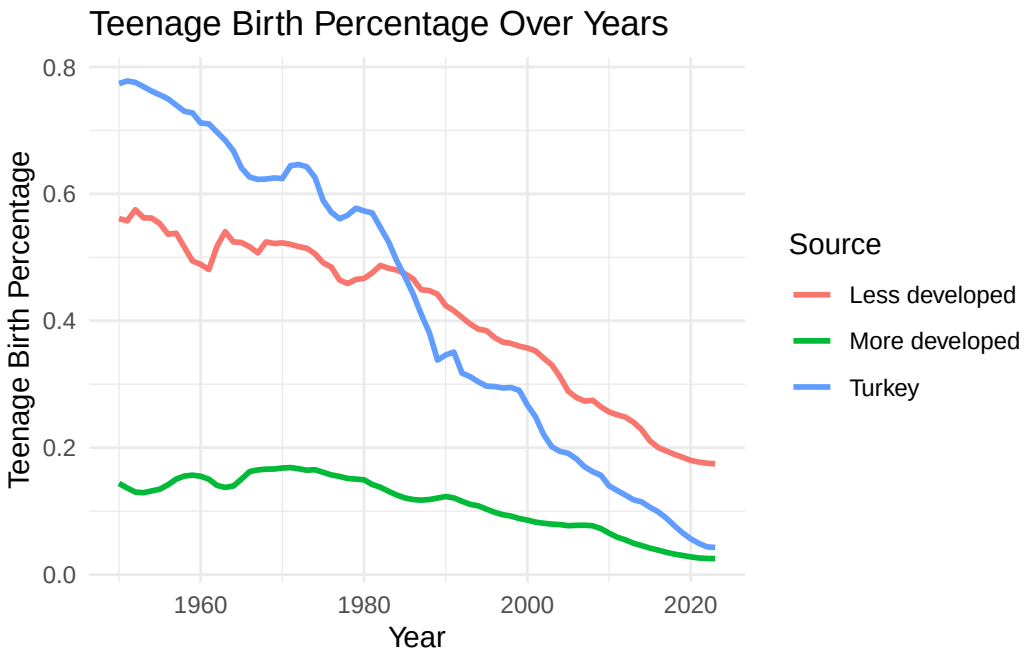
Teen birth rates are shaped by factors like education, healthcare, and family planning. Less developed countries often have higher rates due to limited access to these services. Comparing Turkey to developed and less developed countries helps us understand its progress in these areas.

We created a graph aiming to compare the birth rate among women aged 15-19 in Turkey, More Developed countries, and Less Developed countries.

This code block is used to visualize the graph:

```
library(readxl)
library(tidyverse)
library(ggplot2)


other_parameters <- read_excel("data/other_parameters.xlsx")


turkey_data_other <- other_parameters %>%
  filter(`Region, subregion, country or area *` == "Turkey")

more_developed_data_other <- other_parameters %>%
  filter(`Region, subregion, country or area *` == "More developed regions")

less_developed_data_other <- other_parameters %>%
  filter(`Region, subregion, country or area *` == "Less developed regions")
```

```r
turkey_data_other$Source <- "Turkey"
more_developed_data_other$Source <- "More developed"
less_developed_data_other$Source <- "Less developed"


combined_data <- rbind(turkey_data_other, more_developed_data_other, less_developed_data_other


ggplot(combined_data, aes(x = Year, y = `Teenage Birth Percentage`, color = Source)) +
  geom_line(linewidth = 1) +
  labs(
    title = "Teenage Birth Percentage Over Years",
    x = "Year",
    y = "Teenage Birth Percentage"
  ) +
  theme_minimal()
```



- Unfortunately, in the 1950s, Turkey was behind even the less developed countries in terms of childbirth. However, since the 1990s, it has first caught up with them and nowadays it has reached the level of more developed countries.
- The graph highlights Turkey's transition from having teenage birth rates similar to those of less developed countries in the 1950s to reaching levels comparable to more developed countries in recent years. This trend serves as evidence of Turkey's status as a developing country. The significant reduction in teenage birth rates reflects advancements in socioeconomic development, infrastructure, and access to resources, which are key indicators of a nation progressing toward greater development.

Analysis of Life Expectancy at Birth Over the Years

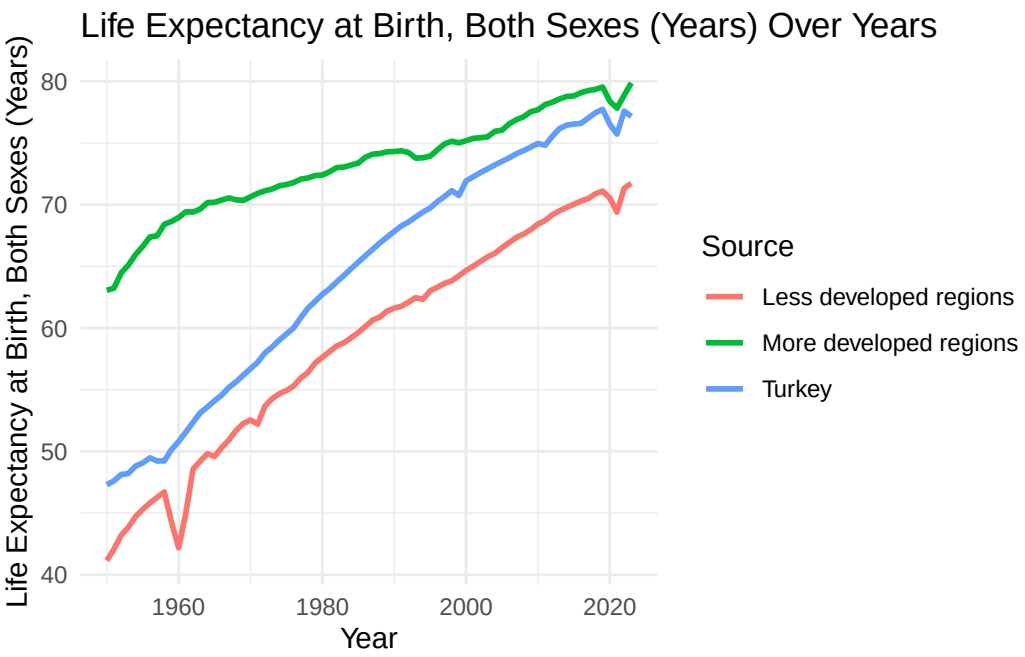
Life expectancy is a key indicator of a population's overall health and well-being. It reflects the average number of years a person can expect to live, considering factors such as healthcare quality, living conditions, sanitation, and nutrition.

In More Developed regions, life expectancy is typically higher due to advanced healthcare systems, better access to medical treatments, and overall higher standards of living.

The following graph illustrates the life expectancy at birth over the years for Turkey, More Developed, and Less Developed countries.

This code block is used to visualize the graph:

```
library(readxl)
library(tidyverse)
library(ggplot2)


life_expectancy <- read_excel("data/life_expectancy.xlsx")


turkey_expectancy <- life_expectancy %>%
  filter(`Region, subregion, country or area *` == "Turkey")

more_developed_expectancy <- life_expectancy %>%
  filter(`Region, subregion, country or area *` == "More developed regions")

less_developed_expectancy <- life_expectancy %>%
  filter(`Region, subregion, country or area *` == "Less developed regions")


turkey_expectancy$Source <- "Turkey"
more_developed_expectancy$Source <- "More developed regions"
less_developed_expectancy$Source <- "Less developed regions"


combined_data <- rbind(turkey_expectancy, more_developed_expectancy, less_developed_expectancy


ggplot(combined_data, aes(x = Year, y = `Life Expectancy at Birth, both sexes (years)`, color
  geom_line(linewidth = 1) +
  labs(
    title = "Life Expectancy at Birth, Both Sexes (Years) Over Years",
    x = "Year",
    y = "Life Expectancy at Birth, Both Sexes (Years)"
  ) +
  theme_minimal()
```



- By examining the graph, just like its geographical location, Turkey serves as a bridge between developed and undeveloped countries in terms of life expectancy as well. However, nowadays, Turkey is extremely close to developed countries. Also, the drops likely caused by COVID-19 in 2020 should not be overlooked.
- This analysis indicates that Turkey is steadily closing the gap with more developed regions, showcasing positive demographic developments in terms of life expectancy.

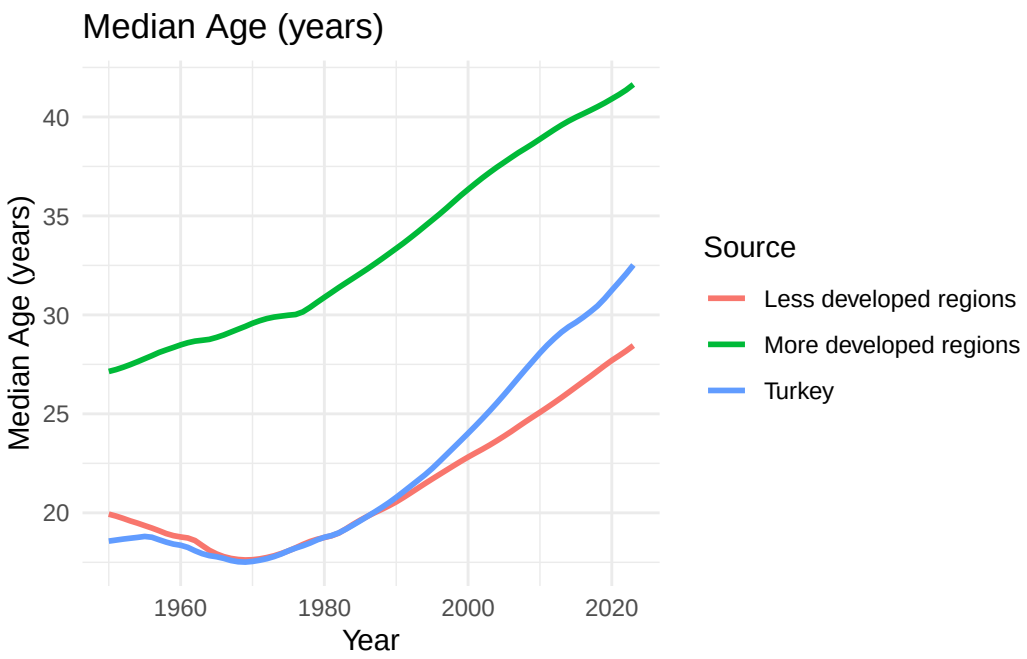
Analysis of Median Age Over the Years

A rising median age typically signals an aging population, which is common in More Developed regions due to lower birth rates and longer life expectancies. These areas often experience a larger proportion of elderly people, which can lead to challenges such as increased demand for healthcare and pension systems.

This code block is used to visualize the graph:

```
library(readxl)
library(tidyverse)
library(ggplot2)


change_in_population <- read_excel("data/change_in_population.xlsx")


turkey_median_age <- change_in_population %>%
  filter(`Region, subregion, country or area *` == "Turkey")

more_developed_median_age <- change_in_population %>%
  filter(`Region, subregion, country or area *` == "More developed regions")

less_developed_median_age <- change_in_population %>%
```

```
  filter(`Region, subregion, country or area *` == "Less developed regions")


turkey_median_age$Source <- "Turkey"
more_developed_median_age$Source <- "More developed regions"
less_developed_median_age$Source <- "Less developed regions"


combined_data <- rbind(turkey_median_age, more_developed_median_age, less_developed_median_age


ggplot(combined_data, aes(x = Year, y = `Median Age, as of 1 July (years)`, color = Source)) +
  geom_line(linewidth = 1) +
  labs(
    title = "Median Age (years)",
    x = "Year",
    y = "Median Age (years)"
  ) +
  theme_minimal()
```



- In the 1950s, Turkey had a very young population, even younger than less developed countries. However, even though it later came to have an older population than those countries, it still has a younger population compared to developed countries.
- While Turkey's population has become older than that of less developed regions, it has not yet reached the aging levels seen in more developed countries, where low birth rates and longer life expectancy have created significantly older populations.

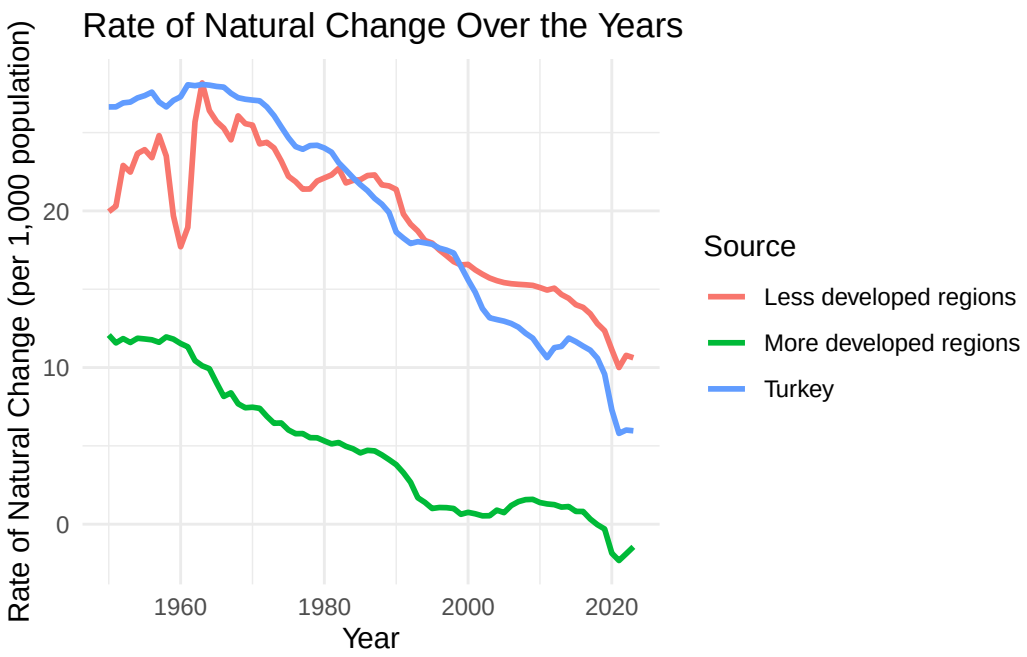
Analysis of Rate Of Natural Change Over the Years

The rate of natural change refers to the difference between the birth rate and the death rate in a population. This rate provides a clear indication of how a population is growing or shrinking, excluding the effects of migration.

A high rate of natural change means a population is growing rapidly, typically due to a high birth rate and/or a low death rate. This is often observed in Less Developed regions. A low or negative rate of natural change, on the other hand, indicates either slow growth or population decline. More Developed regions often experience lower birth rates.

This code block is used to visualize the graph:

```
library(readxl)
library(tidyverse)
library(ggplot2)


change_in_population <- read_excel("data/change_in_population.xlsx")


turkey_rate_of_natural_change <- change_in_population %>%
  filter(`Region, subregion, country or area *` == "Turkey")

more_developed_rate_of_natural_change <- change_in_population %>%
  filter(`Region, subregion, country or area *` == "More developed regions")

less_developed_rate_of_natural_change <- change_in_population %>%
  filter(`Region, subregion, country or area *` == "Less developed regions")


turkey_rate_of_natural_change$Source <- "Turkey"
more_developed_rate_of_natural_change$Source <- "More developed regions"
less_developed_rate_of_natural_change$Source <- "Less developed regions"


combined_data <- rbind(turkey_rate_of_natural_change, more_developed_rate_of_natural_change, l


ggplot(combined_data, aes(x = Year, y = `Rate of Natural Change (per 1,000 population)`, color
  geom_line(linewidth = 1) +
  labs(
    title = "Rate of Natural Change Over the Years",
    x = "Year",
    y = "Rate of Natural Change (per 1,000 population)"
  ) +
  theme_minimal()
```



- While Turkey had the highest population ratio among the groups we compared, its population growth rate has slowed down since the 2000s to be somewhat lower than less developed countries. However, the increase in population ratio in 2020 is noteworthy.

Analysis of Infant Mortality Rate Over the Years

The infant mortality rate refers to the number of infants who die before reaching one year of age, per 1,000 live births in a given year. It is a critical indicator of the overall health and quality of healthcare in a population, as well as the general living conditions.

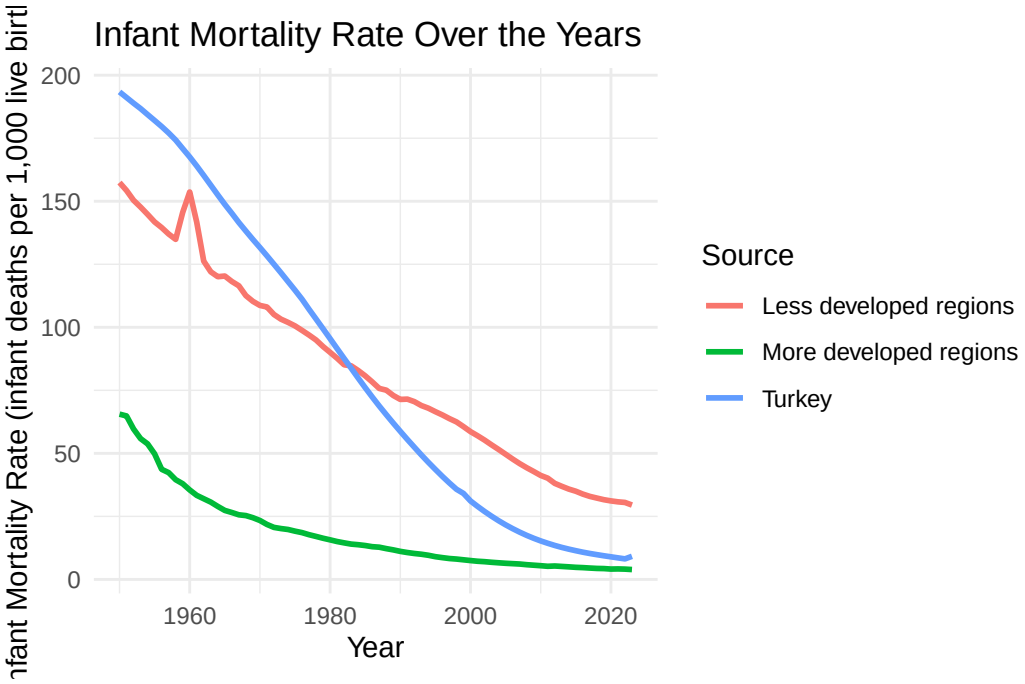
A high infant mortality rate typically reflects challenges such as limited access to healthcare, poor nutrition, inadequate sanitation, and high rates of infectious diseases. This is more commonly seen in Less Developed regions.

The infant mortality rate is not only a measure of health but also a reflection of the effectiveness of a country's healthcare system and its social and economic development. Reducing infant mortality is a key goal for improving public health and overall well-being.

This code block is used to visualize the graph:

```
library(readxl)
library(tidyverse)
library(ggplot2)


child <- read_excel("data/child.xlsx")


turkey_rate_of_infant_mortality <- child %>%
  filter(`Region, subregion, country or area *` == "Turkey")

more_developed_rate_of_infant_mortality <- child %>%
```

```
  filter(`Region, subregion, country or area *` == "More developed regions")

less_developed_rate_of_infant_mortality <- child %>%
  filter(`Region, subregion, country or area *` == "Less developed regions")


turkey_rate_of_infant_mortality$Source <- "Turkey"
more_developed_rate_of_infant_mortality$Source <- "More developed regions"
less_developed_rate_of_infant_mortality$Source <- "Less developed regions"


combined_data <- rbind(turkey_rate_of_infant_mortality, more_developed_rate_of_infant_mortalit


ggplot(combined_data, aes(x = Year, y = `Infant Mortality Rate (infant deaths per 1,000 live b
  geom_line(linewidth = 1) +
  labs(
    title = "Infant Mortality Rate Over the Years",
    x = "Year",
    y = "Infant Mortality Rate (infant deaths per 1,000 live births)"
  ) +
  theme_minimal()
```



- Although Turkey started from a rather poor point in terms of child mortality rate, with a steady improvement rate, it has now reached the level of developed countries.