

# Introduction

## Unemployment

Unemployment refers to the situation where a person is actively searching for employment but is unable to find work. It is considered a key measure of the health of the economy. Unemployment rate is calculated by dividing the number of unemployed people by the number of people in the labor force. High rates of unemployment can signal economic distress, while extremely low rates of unemployment may indicate an overheated economy.

The Dataset that is being explored in this notebook focuses on the African continent, over a time span of 13 years (2010 - 2022)

```
In [2]: # Importing the necessary Libraries
import numpy as np
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
```

The datasets were pulled from [The World Bank Data \(<https://data.worldbank.org/indicator/SL.UEM.TOTL.ZS>\)](https://data.worldbank.org/indicator/SL.UEM.TOTL.ZS)

```
In [3]: # Load the first CSV file
#df1 = pd.read_csv('0de008d6-370d-4d5a-a0ed-a99b4ad16385_Data.csv')

# Load the second CSV file
#df2 = pd.read_csv('unemployment_2.csv')

# Concatenate the two dataframes
#merged_df = pd.concat([df1, df2])

# Save the merged dataframe to a new CSV file
#merged_df.to_csv('merged_file.csv', index=False)
```

```
In [4]: # Load the dataset from a CSV file named 'merged_file.csv'
df = pd.read_csv('merged_file.csv')

# Display the first row of the dataframe
df.head(1)
```

Out[4]:

	Country Name	Country Code	Series Name	Series Code	2022 [YR2022]	2021 [YR2021]	2020 [YR2020]	2019 [YR2019]	20 [YR201]
0	Algeria	DZA	Compulsory education, duration (years)	SE.COM.DURS	10	10	10	10	10

```
In [5]: # Display the dimensions of the dataframe df
df.shape
```

Out[5]: (3391, 17)

```
In [6]: # Create a pivot table from the DataFrame 'df'
# The pivot table will have a multi-index using 'Country Code' and 'Country Name'
pivoted_df = df.pivot_table(index=['Country Code', 'Country Name'], columns='Series Name', values=['2022 [YR2022]', '2021 [YR2021]', '2020 [YR2020]', '2019 [YR2019]', '2018 [YR2018]', '2017 [YR2017]', '2016 [YR2016]', '2015 [YR2015]', '2014 [YR2014]', '2013 [YR2013]', '2012 [YR2012]', '2011 [YR2011]', '2010 [YR2010]'], aggfunc='sum')

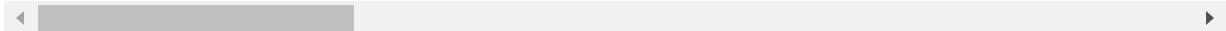
# Display the first 5 rows of the pivot table
pivoted_df.head()
```

Out[6]:

2010 [YR2010]

Series Name	Age dependency ratio (% of working-age population)	Age dependency ratio, old (% of working-age population)	Age dependency ratio, young (% of working-age population)	Compulsory education, duration (years)	Current expenditure on primary total exp in prima instituti
Country Code	Country Name				
AGO	Angola	93.5865714749235	5.03076696433558	88.5558045105879	6
ARE	United Arab Emirates	16.1720159473084	0.204450212873666	15.9675657344347	6
BDI	Burundi	89.4163225949188	4.40883651794272	85.0074860769761	.. 88.0884
BEN	Benin	88.2084184308842	5.98647073474471	82.2219476961395	6 85.3099
BFA	Burkina Faso	93.5238467586573	5.23698585462312	88.2868609040342	10

5 rows × 637 columns



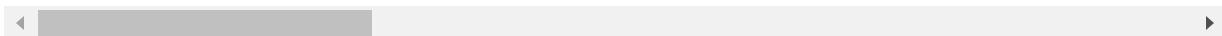
```
In [7]: # Reset the index of the DataFrame 'pivoted_df'
pivoted_df.reset_index(inplace=True)

# Display the first 5 rows of the DataFrame after resetting the index
pivoted_df.head()
```

Out[7]:

	Country Code	Country Name	2010 [YR2010]	Age dependency ratio (% of working-age population)	Age dependency ratio, old (% of working-age population)	Age dependency ratio, young (% of working-age population)	Compulsory education, duration (years)
Series Name							
0	AGO	Angola	93.5865714749235	5.03076696433558	88.5558045105879	6	
1	ARE	United Arab Emirates	16.1720159473084	0.204450212873666	15.9675657344347	6	
2	BDI	Burundi	89.4163225949188	4.40883651794272	85.0074860769761	..	
3	BEN	Benin	88.2084184308842	5.98647073474471	82.2219476961395	6	
4	BFA	Burkina Faso	93.5238467586573	5.23698585462312	88.2868609040342	10	

5 rows × 639 columns



```
In [53]: # Display the dimension of the new dataframe
pivoted_df.shape
```

Out[53]: (54, 158)

```
In [9]: # Confirm the dtype of the dataframe
type(pivoted_df)
```

Out[9]: pandas.core.frame.DataFrame

```
In [10]: # Accessing all the dataframe's columns
df_columns0 = pivoted_df.columns.get_level_values(0).unique()
df_columns0
#df_columns0 = pivoted_df.columns.get_level_values(1).unique()
#df_columns0
```

```
Out[10]: Index(['Country Code', 'Country Name', '2010 [YR2010]', '2011 [YR2011]',
               '2012 [YR2012]', '2013 [YR2013]', '2014 [YR2014]', '2015 [YR2015]',
               '2016 [YR2016]', '2017 [YR2017]', '2018 [YR2018]', '2019 [YR2019]',
               '2020 [YR2020]', '2021 [YR2021]', '2022 [YR2022]'],
              dtype='object')
```

```
In [54]: # Check for missing values in the DataFrame 'pivoted_df'  
pivoted_df.isna().sum().sort_values(ascending=False)
```

Out[54]:

		Series Name
Country Code		
0		
2018 [YR2018]	0	Unemployment, male (% of male labor force) (modeled ILO estimate)
		Compulsory education, duration (years)
0		Population ages 0-14 (% of total population)
0		Population ages 15-64 (% of total population)
0		Population ages 65 and above (% of total population)
0		Population growth (annual %)
0		Population, total
0		Unemployment, female (% of female labor force) (modeled ILO estimate)
0		Unemployment, total (% of total labor force) (modeled ILO estimate)
0		Age dependency ratio, old (% of working-age population)
0		Age dependency ratio, young (% of working-age population)
0		Age dependency ratio, old (% of working-age population)
0		Age dependency ratio, young (% of working-age population)
0		Compulsory education, duration (years)
0		Population ages 0-14 (% of total population)
0		Population ages 15-64 (% of total population)
0		Population ages 65 and above (% of total population)
0		Age dependency ratio, young (% of working-age population)
0		Age dependency ratio (% of working-age population)
0		Population, total
0		Age dependency ratio, young (% of working-age population)
0		Population growth (annual %)
0		Population, total
0		Unemployment, female (% of female labor force) (modeled ILO estimate)
0		Unemployment, male (% of male labor force) (modeled ILO estimate)
0		Unemployment, total (% of total labor force) (modeled ILO estimate)
0		Age dependency ratio (% of working-age population)

Age dependency ratio, old (% of working-age population)  
0  
Compulsory education, duration (years)  
0  
Unemployment, total (% of total labor force) (modeled ILO esti  
mate) 0  
Population ages 0-14 (% of total population)  
0  
Population ages 15-64 (% of total population)  
0  
Population ages 65 and above (% of total population)  
0  
Population growth (annual %)  
0  
Population, total  
0  
Unemployment, female (% of female labor force) (modeled ILO es  
timate) 0  
Unemployment, male (% of male labor force) (modeled ILO estima  
te) 0  
2019 [YR2019] Population growth (annual %)  
0  
Unemployment, female (% of female labor force) (modeled ILO es  
timate) 0  
Country Name  
0  
2022 [YR2022] Age dependency ratio, young (% of working-age population)  
0  
2021 [YR2021] Population growth (annual %)  
0  
Population, total  
0  
Unemployment, female (% of female labor force) (modeled ILO es  
timate) 0  
Unemployment, male (% of male labor force) (modeled ILO estima  
te) 0  
Unemployment, total (% of total labor force) (modeled ILO esti  
mate) 0  
2022 [YR2022] Age dependency ratio (% of working-age population)  
0  
Age dependency ratio, old (% of working-age population)  
0  
Compulsory education, duration (years)  
0  
2021 [YR2021] Population ages 15-64 (% of total population)  
0  
2022 [YR2022] Population ages 0-14 (% of total population)  
0  
Population ages 15-64 (% of total population)  
0  
Population ages 65 and above (% of total population)  
0  
Population growth (annual %)  
0  
Population, total  
0  
Unemployment, female (% of female labor force) (modeled ILO es

time) 0 Unemployment, male (% of male labor force) (modeled ILO estimate)  
te) 0  
2021 [YR2021] Population ages 65 and above (% of total population)  
0  
Population ages 0-14 (% of total population)  
0  
2019 [YR2019] Unemployment, male (% of male labor force) (modeled ILO estimate)  
te) 0  
2020 [YR2020] Population ages 65 and above (% of total population)  
0  
2019 [YR2019] Unemployment, total (% of total labor force) (modeled ILO estimate)  
te) 0  
2020 [YR2020] Age dependency ratio (% of working-age population)  
0  
Age dependency ratio, old (% of working-age population)  
0  
Age dependency ratio, young (% of working-age population)  
0  
Compulsory education, duration (years)  
0  
Population ages 0-14 (% of total population)  
0  
Population ages 15-64 (% of total population)  
0  
Population growth (annual %)  
0  
2021 [YR2021] Compulsory education, duration (years)  
0  
2020 [YR2020] Population, total  
0  
Unemployment, female (% of female labor force) (modeled ILO estimate)  
time) 0  
te) 0  
Unemployment, male (% of male labor force) (modeled ILO estimate)  
mate) 0  
Unemployment, total (% of total labor force) (modeled ILO estimate)  
2021 [YR2021] Age dependency ratio (% of working-age population)  
0  
Age dependency ratio, old (% of working-age population)  
0  
Age dependency ratio, young (% of working-age population)  
0  
2016 [YR2016] Population ages 65 and above (% of total population)  
0  
Population ages 15-64 (% of total population)  
0  
Population ages 0-14 (% of total population)  
0  
2012 [YR2012] Compulsory education, duration (years)  
0  
2011 [YR2011] Population, total  
0  
Unemployment, female (% of female labor force) (modeled ILO estimate)  
time) 0  
te) 0  
Unemployment, male (% of male labor force) (modeled ILO estimate)

Unemployment, total (% of total labor force) (modeled ILO estimate) 0  
2012 [YR2012] Age dependency ratio (% of working-age population)  
0  
Age dependency ratio, old (% of working-age population)  
0  
Age dependency ratio, young (% of working-age population)  
0  
Population ages 0-14 (% of total population)  
0  
2011 [YR2011] Population ages 65 and above (% of total population)  
0  
2012 [YR2012] Population ages 15-64 (% of total population)  
0  
Population ages 65 and above (% of total population)  
0  
Population growth (annual %)  
0  
Population, total  
0  
Unemployment, female (% of female labor force) (modeled ILO estimate) 0  
Unemployment, male (% of male labor force) (modeled ILO estimate) 0  
Unemployment, total (% of total labor force) (modeled ILO estimate) 0  
2011 [YR2011] Population growth (annual %)  
0  
Population ages 15-64 (% of total population)  
0  
2016 [YR2016] Compulsory education, duration (years)  
0  
2010 [YR2010] Population growth (annual %)  
0  
Age dependency ratio (% of working-age population)  
0  
Age dependency ratio, old (% of working-age population)  
0  
Age dependency ratio, young (% of working-age population)  
0  
Compulsory education, duration (years)  
0  
Population ages 0-14 (% of total population)  
0  
Population ages 15-64 (% of total population)  
0  
Population ages 65 and above (% of total population)  
0  
Population, total  
0  
2011 [YR2011] Population ages 0-14 (% of total population)  
0  
2010 [YR2010] Unemployment, female (% of female labor force) (modeled ILO estimate) 0  
Unemployment, male (% of male labor force) (modeled ILO estimate) 0  
Unemployment, total (% of total labor force) (modeled ILO esti

mate) 0  
2011 [YR2011] Age dependency ratio (% of working-age population)  
0  
Age dependency ratio, old (% of working-age population)  
0  
Age dependency ratio, young (% of working-age population)  
0  
Compulsory education, duration (years)  
0  
2013 [YR2013] Age dependency ratio (% of working-age population)  
0  
Age dependency ratio, old (% of working-age population)  
0  
Age dependency ratio, young (% of working-age population)  
0  
2015 [YR2015] Population ages 65 and above (% of total population)  
0  
2014 [YR2014] Unemployment, total (% of total labor force) (modeled ILO esti  
mate) 0  
2015 [YR2015] Age dependency ratio (% of working-age population)  
0  
Age dependency ratio, old (% of working-age population)  
0  
Age dependency ratio, young (% of working-age population)  
0  
Compulsory education, duration (years)  
0  
Population ages 0-14 (% of total population)  
0  
Population ages 15-64 (% of total population)  
0  
Population growth (annual %)  
0  
2013 [YR2013] Compulsory education, duration (years)  
0  
2015 [YR2015] Population, total  
0  
Unemployment, female (% of female labor force) (modeled ILO es  
timate) 0  
Unemployment, male (% of male labor force) (modeled ILO estima  
te) 0  
Unemployment, total (% of total labor force) (modeled ILO esti  
mate) 0  
2016 [YR2016] Age dependency ratio (% of working-age population)  
0  
Age dependency ratio, old (% of working-age population)  
0  
Age dependency ratio, young (% of working-age population)  
0  
2014 [YR2014] Unemployment, male (% of male labor force) (modeled ILO estima  
te) 0  
Unemployment, female (% of female labor force) (modeled ILO es  
timate) 0  
Population, total  
0  
Population growth (annual %)  
0

```
2013 [YR2013] Population ages 0-14 (% of total population)
0
Population ages 15-64 (% of total population)
0
Population ages 65 and above (% of total population)
0
Population growth (annual %)
0
Population, total
0
Unemployment, female (% of female labor force) (modeled ILO es-
timate) 0
Unemployment, male (% of male labor force) (modeled ILO estima-
te) 0
Unemployment, total (% of total labor force) (modeled ILO esti-
mate) 0
2014 [YR2014] Age dependency ratio (% of working-age population)
0
Age dependency ratio, old (% of working-age population)
0
Age dependency ratio, young (% of working-age population)
0
Compulsory education, duration (years)
0
Population ages 0-14 (% of total population)
0
Population ages 15-64 (% of total population)
0
Population ages 65 and above (% of total population)
0
2022 [YR2022] Unemployment, total (% of total labor force) (modeled ILO esti-
mate) 0
dtype: int64
```

```
In [12]: # Replace non-numeric values ('..') with NaN for the entire DataFrame
pivoted_df.replace('..', np.nan, inplace=True)

# Convert numerical columns to float data type
numerical_cols = [col for col in df_columns0 if col not in ['Country Code', 'Country Name']]
for col in numerical_cols:
    pivoted_df[col] = pivoted_df[col].astype(float)

# Check the dtypes of the columns in the dataframe
pivoted_df.dtypes
```

```
Out[12]: Series Name
Country Code
object
Country Name
object
2010 [YR2010] Age dependency ratio (% of working-age population)
float64
Age dependency ratio, old (% of working-age population)
float64
Age dependency ratio, young (% of working-age population)
float64

...
2022 [YR2022] Unemployment, youth female (% of female labor force ages 15-24) (national estimate)
float64
Unemployment, youth male (% of male labor force ages 15-24) (modeled ILO estimate)
float64
Unemployment, youth male (% of male labor force ages 15-24) (national estimate)
float64
Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)
float64
Unemployment, youth total (% of total labor force ages 15-24) (national estimate)
float64
Length: 639, dtype: object
```

```
In [13]: pivoted_df[df_columns0].values
```

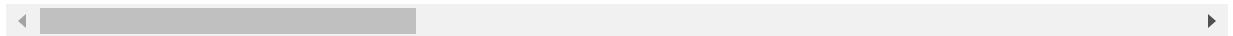
```
Out[13]: array([['AGO', 'Angola', 93.5865714749235, ..., nan, 17.279, nan],
   ['ARE', 'United Arab Emirates', 16.1720159473084, ..., 6.204,
    9.288, 10.383],
   ['BDI', 'Burundi', 89.4163225949188, ..., nan, 1.554, nan],
   ...,
   ['ZAF', 'South Africa', 50.6689277078122, ..., 46.113, 51.519,
    49.571],
   ['ZMB', 'Zambia', 93.5334111091871, ..., nan, 11.033, nan],
   ['ZWE', 'Zimbabwe', 85.5645678660316, ..., nan, 12.374, nan]],
  dtype=object)
```

In [14]: `pivoted_df.head()`

Out[14]:

Series Name	Country Code	Country Name	2010 [YR2010]						Current education expenditure, primary (% of total expenditure in primary public institutions)	e... exp... se... inst
			Age dependency ratio (% of working-age population)	Age dependency ratio, old (% of working-age population)	Age dependency ratio, young (% of working-age population)	Compulsory education duration (years)				
0	AGO	Angola	93.586571	5.030767	88.555805	6.0			NaN	
1	ARE	United Arab Emirates	16.172016	0.204450	15.967566	6.0			NaN	
2	BDI	Burundi	89.416323	4.408837	85.007486		NaN	88.088478	9:	
3	BEN	Benin	88.208418	5.986471	82.221948	6.0	85.309959	9:		
4	BFA	Burkina Faso	93.523847	5.236986	88.286861	10.0	100.000000	9		

5 rows × 639 columns



In [55]: # Checking for missing values after changing the dtype  
pivoted\_df.isna().sum().sort\_values(ascending=False)

Out[55]:

		Series Name
Country Code		
0		
2018 [YR2018]	0	Unemployment, male (% of male labor force) (modeled ILO estimate)
		Compulsory education, duration (years)
0		Population ages 0-14 (% of total population)
0		Population ages 15-64 (% of total population)
0		Population ages 65 and above (% of total population)
0		Population growth (annual %)
0		Population, total
0		Unemployment, female (% of female labor force) (modeled ILO estimate)
0		Unemployment, total (% of total labor force) (modeled ILO estimate)
0		Age dependency ratio, old (% of working-age population)
0		Age dependency ratio, young (% of working-age population)
0		Age dependency ratio, old (% of working-age population)
0		Age dependency ratio, young (% of working-age population)
0		Compulsory education, duration (years)
0		Population ages 0-14 (% of total population)
0		Population ages 15-64 (% of total population)
0		Population ages 65 and above (% of total population)
0		Age dependency ratio, young (% of working-age population)
0		Age dependency ratio (% of working-age population)
0		Population, total
0		Age dependency ratio, young (% of working-age population)
0		Population growth (annual %)
0		Population, total
0		Unemployment, female (% of female labor force) (modeled ILO estimate)
0		Unemployment, male (% of male labor force) (modeled ILO estimate)
0		Unemployment, total (% of total labor force) (modeled ILO estimate)
0		Age dependency ratio (% of working-age population)

Age dependency ratio, old (% of working-age population)  
0  
Compulsory education, duration (years)  
0  
Unemployment, total (% of total labor force) (modeled ILO esti  
mate) 0  
Population ages 0-14 (% of total population)  
0  
Population ages 15-64 (% of total population)  
0  
Population ages 65 and above (% of total population)  
0  
Population growth (annual %)  
0  
Population, total  
0  
Unemployment, female (% of female labor force) (modeled ILO es  
timate) 0  
Unemployment, male (% of male labor force) (modeled ILO estima  
te) 0  
2019 [YR2019] Population growth (annual %)  
0  
Unemployment, female (% of female labor force) (modeled ILO es  
timate) 0  
Country Name  
0  
2022 [YR2022] Age dependency ratio, young (% of working-age population)  
0  
2021 [YR2021] Population growth (annual %)  
0  
Population, total  
0  
Unemployment, female (% of female labor force) (modeled ILO es  
timate) 0  
Unemployment, male (% of male labor force) (modeled ILO estima  
te) 0  
Unemployment, total (% of total labor force) (modeled ILO esti  
mate) 0  
2022 [YR2022] Age dependency ratio (% of working-age population)  
0  
Age dependency ratio, old (% of working-age population)  
0  
Compulsory education, duration (years)  
0  
2021 [YR2021] Population ages 15-64 (% of total population)  
0  
2022 [YR2022] Population ages 0-14 (% of total population)  
0  
Population ages 15-64 (% of total population)  
0  
Population ages 65 and above (% of total population)  
0  
Population growth (annual %)  
0  
Population, total  
0  
Unemployment, female (% of female labor force) (modeled ILO es

time) 0 Unemployment, male (% of male labor force) (modeled ILO estimate)  
te) 0  
2021 [YR2021] Population ages 65 and above (% of total population)  
0  
Population ages 0-14 (% of total population)  
0  
2019 [YR2019] Unemployment, male (% of male labor force) (modeled ILO estimate)  
te) 0  
2020 [YR2020] Population ages 65 and above (% of total population)  
0  
2019 [YR2019] Unemployment, total (% of total labor force) (modeled ILO estimate)  
te) 0  
2020 [YR2020] Age dependency ratio (% of working-age population)  
0  
Age dependency ratio, old (% of working-age population)  
0  
Age dependency ratio, young (% of working-age population)  
0  
Compulsory education, duration (years)  
0  
Population ages 0-14 (% of total population)  
0  
Population ages 15-64 (% of total population)  
0  
Population growth (annual %)  
0  
2021 [YR2021] Compulsory education, duration (years)  
0  
2020 [YR2020] Population, total  
0  
Unemployment, female (% of female labor force) (modeled ILO estimate)  
time) 0  
te) 0  
Unemployment, male (% of male labor force) (modeled ILO estimate)  
mate) 0  
Unemployment, total (% of total labor force) (modeled ILO estimate)  
2021 [YR2021] Age dependency ratio (% of working-age population)  
0  
Age dependency ratio, old (% of working-age population)  
0  
Age dependency ratio, young (% of working-age population)  
0  
2016 [YR2016] Population ages 65 and above (% of total population)  
0  
Population ages 15-64 (% of total population)  
0  
Population ages 0-14 (% of total population)  
0  
2012 [YR2012] Compulsory education, duration (years)  
0  
2011 [YR2011] Population, total  
0  
Unemployment, female (% of female labor force) (modeled ILO estimate)  
time) 0  
te) 0  
Unemployment, male (% of male labor force) (modeled ILO estimate)

Unemployment, total (% of total labor force) (modeled ILO estimate) 0  
2012 [YR2012] Age dependency ratio (% of working-age population)  
0  
Age dependency ratio, old (% of working-age population)  
0  
Age dependency ratio, young (% of working-age population)  
0  
Population ages 0-14 (% of total population)  
0  
2011 [YR2011] Population ages 65 and above (% of total population)  
0  
2012 [YR2012] Population ages 15-64 (% of total population)  
0  
Population ages 65 and above (% of total population)  
0  
Population growth (annual %)  
0  
Population, total  
0  
Unemployment, female (% of female labor force) (modeled ILO estimate) 0  
Unemployment, male (% of male labor force) (modeled ILO estimate) 0  
Unemployment, total (% of total labor force) (modeled ILO estimate) 0  
2011 [YR2011] Population growth (annual %)  
0  
Population ages 15-64 (% of total population)  
0  
2016 [YR2016] Compulsory education, duration (years)  
0  
2010 [YR2010] Population growth (annual %)  
0  
Age dependency ratio (% of working-age population)  
0  
Age dependency ratio, old (% of working-age population)  
0  
Age dependency ratio, young (% of working-age population)  
0  
Compulsory education, duration (years)  
0  
Population ages 0-14 (% of total population)  
0  
Population ages 15-64 (% of total population)  
0  
Population ages 65 and above (% of total population)  
0  
Population, total  
0  
2011 [YR2011] Population ages 0-14 (% of total population)  
0  
2010 [YR2010] Unemployment, female (% of female labor force) (modeled ILO estimate) 0  
Unemployment, male (% of male labor force) (modeled ILO estimate) 0  
Unemployment, total (% of total labor force) (modeled ILO esti

mate) 0  
2011 [YR2011] Age dependency ratio (% of working-age population)  
0  
Age dependency ratio, old (% of working-age population)  
0  
Age dependency ratio, young (% of working-age population)  
0  
Compulsory education, duration (years)  
0  
2013 [YR2013] Age dependency ratio (% of working-age population)  
0  
Age dependency ratio, old (% of working-age population)  
0  
Age dependency ratio, young (% of working-age population)  
0  
2015 [YR2015] Population ages 65 and above (% of total population)  
0  
2014 [YR2014] Unemployment, total (% of total labor force) (modeled ILO esti  
mate) 0  
2015 [YR2015] Age dependency ratio (% of working-age population)  
0  
Age dependency ratio, old (% of working-age population)  
0  
Age dependency ratio, young (% of working-age population)  
0  
Compulsory education, duration (years)  
0  
Population ages 0-14 (% of total population)  
0  
Population ages 15-64 (% of total population)  
0  
Population growth (annual %)  
0  
2013 [YR2013] Compulsory education, duration (years)  
0  
2015 [YR2015] Population, total  
0  
Unemployment, female (% of female labor force) (modeled ILO es  
timate) 0  
Unemployment, male (% of male labor force) (modeled ILO estima  
te) 0  
Unemployment, total (% of total labor force) (modeled ILO esti  
mate) 0  
2016 [YR2016] Age dependency ratio (% of working-age population)  
0  
Age dependency ratio, old (% of working-age population)  
0  
Age dependency ratio, young (% of working-age population)  
0  
2014 [YR2014] Unemployment, male (% of male labor force) (modeled ILO estima  
te) 0  
Unemployment, female (% of female labor force) (modeled ILO es  
timate) 0  
Population, total  
0  
Population growth (annual %)  
0

```
2013 [YR2013] Population ages 0-14 (% of total population)
0
Population ages 15-64 (% of total population)
0
Population ages 65 and above (% of total population)
0
Population growth (annual %)
0
Population, total
0
Unemployment, female (% of female labor force) (modeled ILO es-
timate) 0
Unemployment, male (% of male labor force) (modeled ILO estima-
te) 0
Unemployment, total (% of total labor force) (modeled ILO esti-
mate) 0
2014 [YR2014] Age dependency ratio (% of working-age population)
0
Age dependency ratio, old (% of working-age population)
0
Age dependency ratio, young (% of working-age population)
0
Compulsory education, duration (years)
0
Population ages 0-14 (% of total population)
0
Population ages 15-64 (% of total population)
0
Population ages 65 and above (% of total population)
0
2022 [YR2022] Unemployment, total (% of total labor force) (modeled ILO esti-
mate) 0
dtype: int64
```

```
In [17]: # Define a threshold for the maximum number of missing values allowed in a column and create a list of columns in 'pivoted_df'
# that have more than 10 missing values
threshold = [col for col in pivoted_df.columns if pivoted_df[col].isna().sum() > 10]

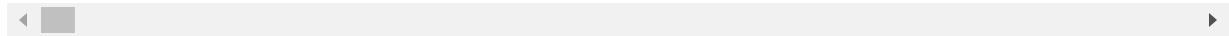
# Set pandas display options to show all rows and columns
pd.set_option('display.max_rows', None)
pd.set_option('display.max_columns', None)

# Drop the columns in 'pivoted_df' that have more than 10 missing values
pivoted_df.drop(threshold, axis=1, inplace=True)

# Display the first 5 rows of the DataFrame after dropping the columns
pivoted_df.head()
```

Out[17]:

Series Name	Country Code	Country Name	2010 [YR2010]						Popul age
			Age dependency ratio (% of working-age population)	Age dependency ratio, old (% of working-age population)	Age dependency ratio, young (% of working-age population)	Compulsory education, duration (years)	Population ages 0-14 (% of total population)		
0	AGO	Angola	93.586571	5.030767	88.555805	6.0	45.744807	1068	
1	ARE	United Arab Emirates	16.172016	0.204450	15.967566	6.0	13.744765	116	
2	BDI	Burundi	89.416323	4.408837	85.007486	NaN	44.878646	409	
3	BEN	Benin	88.208418	5.986471	82.221948	6.0	43.686649	412	
4	BFA	Burkina Faso	93.523847	5.236986	88.286861	10.0	45.620663	735	



```
In [18]: # checking the dimension of the dataframe
pivoted_df.shape
```

Out[18]: (69, 288)

In [19]: # Checking for NaN values again  
pivoted\_df.isna().sum().sort\_values(ascending=False)

**Out[19]:**

Series Name
2012 [YR2012] Compulsory education, duration (years)
6
2011 [YR2011] Compulsory education, duration (years)
6
2010 [YR2010] Compulsory education, duration (years)
6
2013 [YR2013] Compulsory education, duration (years)
6
2014 [YR2014] Compulsory education, duration (years)
6
2016 [YR2016] Compulsory education, duration (years)
5
2017 [YR2017] Compulsory education, duration (years)
5
2022 [YR2022] Compulsory education, duration (years)
5
2018 [YR2018] Compulsory education, duration (years)
5
2021 [YR2021] Compulsory education, duration (years)
5
2019 [YR2019] Compulsory education, duration (years)
5
2015 [YR2015] Compulsory education, duration (years)
5
2020 [YR2020] Compulsory education, duration (years)
5
2019 [YR2019] Unemployment, female (% of female labor force) (modeled ILO estimate)
1
2014 [YR2014] Unemployment, female (% of female labor force) (modeled ILO estimate)
1
2019 [YR2019] Unemployment, male (% of male labor force) (modeled ILO estimate)
1
2014 [YR2014] Unemployment, male (% of male labor force) (modeled ILO estimate)
1
2019 [YR2019] Unemployment, total (% of total labor force) (modeled ILO estimate)
1
Unemployment, youth female (% of female labor force ages 15-24) (modeled ILO estimate)
1
Unemployment, youth male (% of male labor force ages 15-24) (modeled ILO estimate)
1
Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)
1
2022 [YR2022] Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)
1
2013 [YR2013] Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)
1
2014 [YR2014] Unemployment, youth female (% of female labor force ages 15-24) (modeled ILO estimate)
1
2013 [YR2013] Unemployment, youth male (% of male labor force ages 15-24) (modeled ILO estimate)
1
Unemployment, youth female (% of female labor force ages 15-24) (modeled ILO estimate)
1
Unemployment, total (% of total labor force) (modeled ILO estimate)
1
Unemployment, male (% of male labor force) (modeled ILO estimate)
1

2020 [YR2020] Unemployment, female (% of female labor force) (modeled ILO estimate) 1  
Unemployment, male (% of male labor force) (modeled ILO estimate) 1  
Unemployment, total (% of total labor force) (modeled ILO estimate) 1  
Unemployment, youth female (% of female labor force ages 15-24) (modeled ILO estimate) 1  
2012 [YR2012] Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate) 1  
Unemployment, youth male (% of male labor force ages 15-24) (modeled ILO estimate) 1  
2014 [YR2014] Unemployment, total (% of total labor force) (modeled ILO estimate) 1  
2018 [YR2018] Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate) 1  
2014 [YR2014] Unemployment, youth male (% of male labor force ages 15-24) (modeled ILO estimate) 1  
2016 [YR2016] Unemployment, female (% of female labor force) (modeled ILO estimate) 1  
2017 [YR2017] Unemployment, female (% of female labor force) (modeled ILO estimate) 1  
Unemployment, male (% of male labor force) (modeled ILO estimate) 1  
Unemployment, total (% of total labor force) (modeled ILO estimate) 1  
Unemployment, youth female (% of female labor force ages 15-24) (modeled ILO estimate) 1  
Unemployment, youth male (% of male labor force ages 15-24) (modeled ILO estimate) 1  
Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate) 1  
2016 [YR2016] Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate) 1  
Unemployment, youth male (% of male labor force ages 15-24) (modeled ILO estimate) 1  
Unemployment, youth female (% of female labor force ages 15-24) (modeled ILO estimate) 1  
Unemployment, total (% of total labor force) (modeled ILO estimate) 1  
Unemployment, male (% of male labor force) (modeled ILO estimate) 1  
2018 [YR2018] Unemployment, female (% of female labor force) (modeled ILO estimate) 1  
2014 [YR2014] Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate) 1  
2018 [YR2018] Unemployment, male (% of male labor force) (modeled ILO estimate) 1  
Unemployment, total (% of total labor force) (modeled ILO estimate) 1  
2015 [YR2015] Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate) 1  
Unemployment, youth male (% of male labor force ages 15-24) (modeled ILO estimate) 1  
Unemployment, youth female (% of female labor force ages 15-24) (modeled ILO estimate) 1  
Unemployment, total (% of total labor force) (modeled ILO estimate) 1

mate) 1  
Unemployment, male (% of male labor force) (modeled ILO estimate) 1  
Unemployment, female (% of female labor force) (modeled ILO estimate) 1  
2018 [YR2018] Unemployment, youth female (% of female labor force ages 15-24) (modeled ILO estimate) 1  
Unemployment, youth male (% of male labor force ages 15-24) (modeled ILO estimate) 1  
2012 [YR2012] Unemployment, total (% of total labor force) (modeled ILO estimate) 1  
Unemployment, youth female (% of female labor force ages 15-24) (modeled ILO estimate) 1  
2013 [YR2013] Unemployment, female (% of female labor force) (modeled ILO estimate) 1  
2012 [YR2012] Unemployment, male (% of male labor force) (modeled ILO estimate) 1  
2010 [YR2010] Unemployment, youth female (% of female labor force ages 15-24) (modeled ILO estimate) 1  
2011 [YR2011] Unemployment, youth female (% of female labor force ages 15-24) (modeled ILO estimate) 1  
Unemployment, total (% of total labor force) (modeled ILO estimate) 1  
Unemployment, male (% of male labor force) (modeled ILO estimate) 1  
Unemployment, female (% of female labor force) (modeled ILO estimate) 1  
2010 [YR2010] Unemployment, female (% of female labor force) (modeled ILO estimate) 1  
Unemployment, male (% of male labor force) (modeled ILO estimate) 1  
Unemployment, total (% of total labor force) (modeled ILO estimate) 1  
2021 [YR2021] Unemployment, female (% of female labor force) (modeled ILO estimate) 1  
2011 [YR2011] Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate) 1  
2021 [YR2021] Unemployment, male (% of male labor force) (modeled ILO estimate) 1  
Unemployment, total (% of total labor force) (modeled ILO estimate) 1  
2010 [YR2010] Unemployment, youth male (% of male labor force ages 15-24) (modeled ILO estimate) 1  
Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate) 1  
2021 [YR2021] Unemployment, youth female (% of female labor force ages 15-24) (modeled ILO estimate) 1  
2012 [YR2012] Unemployment, female (% of female labor force) (modeled ILO estimate) 1  
2021 [YR2021] Unemployment, youth male (% of male labor force ages 15-24) (modeled ILO estimate) 1  
2011 [YR2011] Unemployment, youth male (% of male labor force ages 15-24) (modeled ILO estimate) 1  
2021 [YR2021] Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate) 1  
2022 [YR2022] Unemployment, youth male (% of male labor force ages 15-24) (modeled ILO estimate) 1

Unemployment, youth female (% of female labor force ages 15-24) (modeled ILO estimate) 1  
2020 [YR2020] Unemployment, youth male (% of male labor force ages 15-24) (modeled ILO estimate) 1  
2022 [YR2022] Unemployment, female (% of female labor force) (modeled ILO estimate) 1  
2020 [YR2020] Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate) 1  
2022 [YR2022] Unemployment, male (% of male labor force) (modeled ILO estimate) 1  
Population growth (annual %)  
1  
Unemployment, total (% of total labor force) (modeled ILO estimate) 1  
Population, male (% of total population)  
0  
2018 [YR2018] Age dependency ratio (% of working-age population)  
0  
2022 [YR2022] Population, total  
0  
Population ages 65 and above (% of total population)  
0  
Population ages 15-64 (% of total population)  
0  
Population ages 0-14, total  
0  
2017 [YR2017] Population, total  
0  
2022 [YR2022] Population ages 0-14 (% of total population)  
0  
Age dependency ratio, young (% of working-age population)  
0  
Age dependency ratio, old (% of working-age population)  
0  
Age dependency ratio (% of working-age population)  
0  
2018 [YR2018] Age dependency ratio, old (% of working-age population)  
0  
Population, total  
0  
2022 [YR2022] Population ages 15-64, total  
0  
2018 [YR2018] Population, male (% of total population)  
0  
Population ages 0-14 (% of total population)  
0  
Population ages 0-14, total  
0  
Population ages 15-64 (% of total population)  
0  
Population ages 15-64, total  
0  
Population ages 65 and above (% of total population)  
0  
Population ages 65 and above, total  
0  
Population growth (annual %)

0  
2019 [YR2019] Age dependency ratio (% of working-age population)  
0  
2018 [YR2018] Population, female (% of total population)  
0  
Population, male  
0  
2022 [YR2022] Population ages 65 and above, total  
0  
Population, female  
0  
Population, female (% of total population)  
0  
Population, male  
0  
2018 [YR2018] Age dependency ratio, young (% of working-age population)  
0  
Population, female  
0  
2019 [YR2019] Population ages 65 and above (% of total population)  
0  
Age dependency ratio, old (% of working-age population)  
0  
2021 [YR2021] Population ages 65 and above, total  
0  
Population ages 15-64, total  
0  
Population ages 15-64 (% of total population)  
0  
2017 [YR2017] Population, male  
0  
2020 [YR2020] Population ages 0-14, total  
0  
Population ages 15-64 (% of total population)  
0  
Population ages 15-64, total  
0  
Population ages 65 and above (% of total population)  
0  
Population ages 65 and above, total  
0  
Population growth (annual %)  
0  
Population, female  
0  
Population, female (% of total population)  
0  
Population, male  
0  
Population, male (% of total population)  
0  
Population, total  
0  
2021 [YR2021] Population ages 0-14, total  
0  
Population ages 0-14 (% of total population)  
0

Age dependency ratio, young (% of working-age population)  
0  
Age dependency ratio, old (% of working-age population)  
0  
Age dependency ratio (% of working-age population)  
0  
Population ages 65 and above (% of total population)  
0  
Population growth (annual %)  
0  
2019 [YR2019] Age dependency ratio, young (% of working-age population)  
0  
2020 [YR2020] Population ages 0-14 (% of total population)  
0  
2019 [YR2019] Population ages 0-14 (% of total population)  
0  
Population ages 0-14, total  
0  
Population ages 15-64 (% of total population)  
0  
Population ages 15-64, total  
0  
Population ages 65 and above, total  
0  
Population growth (annual %)  
0  
Population, female  
0  
2021 [YR2021] Population, total  
0  
Population, male (% of total population)  
0  
Population, male  
0  
2019 [YR2019] Population, female (% of total population)  
0  
Population, male  
0  
Population, male (% of total population)  
0  
Population, total  
0  
2020 [YR2020] Age dependency ratio (% of working-age population)  
0  
Age dependency ratio, old (% of working-age population)  
0  
2021 [YR2021] Population, female (% of total population)  
0  
2020 [YR2020] Age dependency ratio, young (% of working-age population)  
0  
2021 [YR2021] Population, female  
0  
2017 [YR2017] Population, male (% of total population)  
0  
Country Code  
0  
2017 [YR2017] Population, female (% of total population)

0  
2012 [YR2012] Population, male  
0  
Age dependency ratio (% of working-age population)  
0  
Age dependency ratio, old (% of working-age population)  
0  
Age dependency ratio, young (% of working-age population)  
0  
Population ages 0-14 (% of total population)  
0  
Population ages 0-14, total  
0  
Population ages 15-64 (% of total population)  
0  
Population ages 15-64, total  
0  
Population ages 65 and above (% of total population)  
0  
Population ages 65 and above, total  
0  
Population growth (annual %)  
0  
Population, female  
0  
Population, female (% of total population)  
0  
Population, male (% of total population)  
0  
2011 [YR2011] Population, male (% of total population)  
0  
2012 [YR2012] Population, total  
0  
2013 [YR2013] Age dependency ratio (% of working-age population)  
0  
Age dependency ratio, old (% of working-age population)  
0  
Age dependency ratio, young (% of working-age population)  
0  
Population ages 0-14 (% of total population)  
0  
Population ages 0-14, total  
0  
Population ages 15-64 (% of total population)  
0  
Population ages 15-64, total  
0  
Population ages 65 and above (% of total population)  
0  
Population ages 65 and above, total  
0  
Population growth (annual %)  
0  
Population, female  
0  
2011 [YR2011] Population, total  
0

Population, male  
0  
2017 [YR2017] Population, female  
0  
2010 [YR2010] Population, male  
0  
Age dependency ratio (% of working-age population)  
0  
Age dependency ratio, old (% of working-age population)  
0  
Age dependency ratio, young (% of working-age population)  
0  
Population ages 0-14 (% of total population)  
0  
Population ages 0-14, total  
0  
Population ages 15-64 (% of total population)  
0  
Population ages 15-64, total  
0  
Population ages 65 and above (% of total population)  
0  
Population ages 65 and above, total  
0  
Population growth (annual %)  
0  
Population, female  
0  
Population, female (% of total population)  
0  
Population, male (% of total population)  
0  
2011 [YR2011] Population, female (% of total population)  
0  
2010 [YR2010] Population, total  
0  
2011 [YR2011] Age dependency ratio (% of working-age population)  
0  
Age dependency ratio, old (% of working-age population)  
0  
Age dependency ratio, young (% of working-age population)  
0  
Population ages 0-14 (% of total population)  
0  
Population ages 0-14, total  
0  
Population ages 15-64 (% of total population)  
0  
Population ages 15-64, total  
0  
Population ages 65 and above (% of total population)  
0  
Population ages 65 and above, total  
0  
Population growth (annual %)  
0  
Population, female

0  
2013 [YR2013] Population, female (% of total population)  
0  
Population, male  
0  
Population, male (% of total population)  
0  
2016 [YR2016] Population, female (% of total population)  
0  
2015 [YR2015] Population, total  
0  
2016 [YR2016] Age dependency ratio (% of working-age population)  
0  
Age dependency ratio, old (% of working-age population)  
0  
Age dependency ratio, young (% of working-age population)  
0  
Population ages 0-14 (% of total population)  
0  
Population ages 0-14, total  
0  
Population ages 15-64 (% of total population)  
0  
Population ages 15-64, total  
0  
Population ages 65 and above (% of total population)  
0  
Population ages 65 and above, total  
0  
Country Name  
0  
2016 [YR2016] Population, female  
0  
Population, male  
0  
2013 [YR2013] Population, total  
0  
2016 [YR2016] Population, male (% of total population)  
0  
Population, total  
0  
2017 [YR2017] Age dependency ratio (% of working-age population)  
0  
Age dependency ratio, old (% of working-age population)  
0  
Age dependency ratio, young (% of working-age population)  
0  
Population ages 0-14 (% of total population)  
0  
Population ages 0-14, total  
0  
Population ages 15-64 (% of total population)  
0  
Population ages 15-64, total  
0  
Population ages 65 and above (% of total population)  
0

Population ages 65 and above, total  
0  
Population growth (annual %)  
0  
2015 [YR2015] Population, male (% of total population)  
0  
Population, male  
0  
Population, female (% of total population)  
0  
Population, female  
0  
2014 [YR2014] Age dependency ratio (% of working-age population)  
0  
Age dependency ratio, old (% of working-age population)  
0  
Age dependency ratio, young (% of working-age population)  
0  
Population ages 0-14 (% of total population)  
0  
Population ages 0-14, total  
0  
Population ages 15-64 (% of total population)  
0  
Population ages 15-64, total  
0  
Population ages 65 and above (% of total population)  
0  
Population ages 65 and above, total  
0  
Population growth (annual %)  
0  
Population, female  
0  
Population, female (% of total population)  
0  
Population, male  
0  
Population, male (% of total population)  
0  
Population, total  
0  
2015 [YR2015] Age dependency ratio (% of working-age population)  
0  
Age dependency ratio, old (% of working-age population)  
0  
Age dependency ratio, young (% of working-age population)  
0  
Population ages 0-14 (% of total population)  
0  
Population ages 0-14, total  
0  
Population ages 15-64 (% of total population)  
0  
Population ages 15-64, total  
0  
Population ages 65 and above (% of total population)

```
0          Population ages 65 and above, total
0          Population growth (annual %)
0  2016 [YR2016]  Population growth (annual %)
0
dtype: int64
```

## Fill in missing values with the mean

```
In [20]: # Import the SimpleImputer class from the sklearn.impute module
from sklearn.impute import SimpleImputer

# Iterate over each column in the DataFrame 'pivoted_df'
for col in pivoted_df:
    # Check if the data type of the column is not 'object'
    if pivoted_df[col].dtype != 'object': # Numerical column
        # Create an instance of the SimpleImputer class
        imputer = SimpleImputer(strategy='mean')

        # Apply the imputer to the column
        pivoted_df[col] = imputer.fit_transform(pivoted_df[[col]])
```

```
In [21]: # Check for missing values
pivoted_df.isna().sum().sort_values(ascending=False)
```

Out[21]:

	Series Name
Country Code	
0	
Country Name	
0	
2018 [YR2018]	Unemployment, total (% of total labor force) (modeled ILO estimate)
	0
	Unemployment, male (% of male labor force) (modeled ILO estimate)
	0
	Unemployment, female (% of female labor force) (modeled ILO estimate)
	0
	Population, total
0	
	Population, male (% of total population)
0	
	Population, male
0	
	Population, female (% of total population)
0	
	Population, female
0	
	Population growth (annual %)
0	
	Population ages 65 and above, total
0	
	Population ages 65 and above (% of total population)
0	
	Population ages 15-64, total
0	
	Population ages 15-64 (% of total population)
0	
	Population ages 0-14, total
0	
	Population ages 0-14 (% of total population)
0	
4)	Unemployment, youth female (% of female labor force ages 15-24) (modeled ILO estimate)
	0
	Unemployment, youth male (% of male labor force ages 15-24) (modeled ILO estimate)
	0
	Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)
	0
2019 [YR2019]	Population ages 65 and above (% of total population)
0	
	Population, male (% of total population)
0	
	Population, male
0	
	Population, female (% of total population)
0	
	Population, female
0	
	Population growth (annual %)
0	
	Population ages 65 and above, total
0	
	Population ages 15-64, total
0	

Age dependency ratio (% of working-age population)  
0  
Population ages 15-64 (% of total population)  
0  
Population ages 0-14, total  
0  
Population ages 0-14 (% of total population)  
0  
Compulsory education, duration (years)  
0  
Age dependency ratio, young (% of working-age population)  
0  
Age dependency ratio, old (% of working-age population)  
0  
2018 [YR2018] Compulsory education, duration (years)  
0  
Age dependency ratio, young (% of working-age population)  
0  
Age dependency ratio, old (% of working-age population)  
0  
2016 [YR2016] Unemployment, youth female (% of female labor force ages 15-24) (modeled ILO estimate) 0  
2017 [YR2017] Compulsory education, duration (years)  
0  
Age dependency ratio, young (% of working-age population)  
0  
Age dependency ratio, old (% of working-age population)  
0  
Age dependency ratio (% of working-age population)  
0  
2016 [YR2016] Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate) 0  
Unemployment, youth male (% of male labor force ages 15-24) (modeled ILO estimate) 0  
Unemployment, total (% of total labor force) (modeled ILO estimate) 0  
2017 [YR2017] Population ages 0-14, total  
0  
2016 [YR2016] Unemployment, male (% of male labor force) (modeled ILO estimate) 0  
Unemployment, female (% of female labor force) (modeled ILO estimate) 0  
Population, total  
0  
Population, male (% of total population)  
0  
Population, male  
0  
Population, female (% of total population)  
0  
2017 [YR2017] Population ages 0-14 (% of total population)  
0  
Population ages 15-64 (% of total population)  
0  
2018 [YR2018] Age dependency ratio (% of working-age population)  
0  
2017 [YR2017] Population, total

0  
    Unemployment, youth total (% of total labor force ages 15-24)  
(modeled ILO estimate) 0  
        Unemployment, youth male (% of male labor force ages 15-24) (m  
odeled ILO estimate) 0  
            Unemployment, youth female (% of female labor force ages 15-2  
4) (modeled ILO estimate) 0  
            Unemployment, total (% of total labor force) (modeled ILO esti  
mate) 0  
            Unemployment, male (% of male labor force) (modeled ILO estima  
te) 0  
            Unemployment, female (% of female labor force) (modeled ILO es  
timate) 0  
            Population, male (% of total population)  
0  
    Population ages 15-64, total  
0  
    Population, male  
0  
    Population, female (% of total population)  
0  
    Population, female  
0  
    Population growth (annual %)  
0  
    Population ages 65 and above, total  
0  
    Population ages 65 and above (% of total population)  
0  
2019 [YR2019] Population, total  
0  
    Unemployment, female (% of female labor force) (modeled ILO es  
timate) 0  
        Unemployment, male (% of male labor force) (modeled ILO estima  
te) 0  
2021 [YR2021] Unemployment, total (% of total labor force) (modeled ILO esti  
mate) 0  
2022 [YR2022] Age dependency ratio, young (% of working-age population)  
0  
    Age dependency ratio, old (% of working-age population)  
0  
    Age dependency ratio (% of working-age population)  
0  
2021 [YR2021] Unemployment, youth total (% of total labor force ages 15-24)  
(modeled ILO estimate) 0  
        Unemployment, youth male (% of male labor force ages 15-24) (m  
odeled ILO estimate) 0  
            Unemployment, youth female (% of female labor force ages 15-2  
4) (modeled ILO estimate) 0  
            Unemployment, male (% of male labor force) (modeled ILO estima  
te) 0  
2022 [YR2022] Population ages 0-14 (% of total population)  
0  
2021 [YR2021] Unemployment, female (% of female labor force) (modeled ILO es  
timate) 0  
    Population, total  
0

Population, male (% of total population)  
0  
Population, male  
0  
Population, female (% of total population)  
0  
Population, female  
0  
2022 [YR2022] Compulsory education, duration (years)  
0  
Population ages 0-14, total  
0  
2021 [YR2021] Population ages 65 and above, total  
0  
2022 [YR2022] Population, male (% of total population)  
0  
Unemployment, youth male (% of male labor force ages 15-24) (modeled ILO estimate) 0  
Unemployment, youth female (% of female labor force ages 15-24) (modeled ILO estimate) 0  
Unemployment, total (% of total labor force) (modeled ILO estimate) 0  
Unemployment, male (% of male labor force) (modeled ILO estimate) 0  
Unemployment, female (% of female labor force) (modeled ILO estimate) 0  
Population, total  
0  
Population, male  
0  
Population ages 15-64 (% of total population)  
0  
Population, female (% of total population)  
0  
Population, female  
0  
Population growth (annual %)  
0  
Population ages 65 and above, total  
0  
Population ages 65 and above (% of total population)  
0  
Population ages 15-64, total  
0  
2021 [YR2021] Population growth (annual %)  
0  
Population ages 65 and above (% of total population)  
0  
2019 [YR2019] Unemployment, total (% of total labor force) (modeled ILO estimate) 0  
2020 [YR2020] Population ages 0-14 (% of total population)  
0  
Population growth (annual %)  
0  
Population ages 65 and above, total  
0  
Population ages 65 and above (% of total population)

0 Population ages 15-64, total  
0 Population ages 15-64 (% of total population)  
0 Population ages 0-14, total  
0 Compulsory education, duration (years)  
0 Population, female (% of total population)  
0 Age dependency ratio, young (% of working-age population)  
0 Age dependency ratio, old (% of working-age population)  
0 Age dependency ratio (% of working-age population)  
0 2019 [YR2019] Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate) 0  
Unemployment, youth male (% of male labor force ages 15-24) (modeled ILO estimate) 0  
Unemployment, youth female (% of female labor force ages 15-24) (modeled ILO estimate) 0  
2020 [YR2020] Population, female  
0 Population, male  
0 2021 [YR2021] Population ages 15-64, total  
0 Age dependency ratio (% of working-age population)  
0 Population ages 15-64 (% of total population)  
0 Population ages 0-14, total  
0 Population ages 0-14 (% of total population)  
0 Compulsory education, duration (years)  
0 Age dependency ratio, young (% of working-age population)  
0 Age dependency ratio, old (% of working-age population)  
0 2020 [YR2020] Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate) 0  
Population, male (% of total population)  
0 Unemployment, youth male (% of male labor force ages 15-24) (modeled ILO estimate) 0  
Unemployment, youth female (% of female labor force ages 15-24) (modeled ILO estimate) 0  
Unemployment, total (% of total labor force) (modeled ILO estimate) 0  
Unemployment, male (% of male labor force) (modeled ILO estimate) 0  
Unemployment, female (% of female labor force) (modeled ILO estimate) 0

Population, total  
0  
2016 [YR2016] Population, female  
0  
Population growth (annual %)  
0  
Population ages 65 and above, total  
0  
2011 [YR2011] Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate) 0  
2012 [YR2012] Population ages 0-14, total  
0  
Population ages 0-14 (% of total population)  
0  
Compulsory education, duration (years)  
0  
Age dependency ratio, young (% of working-age population)  
0  
Age dependency ratio, old (% of working-age population)  
0  
Age dependency ratio (% of working-age population)  
0  
2011 [YR2011] Unemployment, youth male (% of male labor force ages 15-24) (modeled ILO estimate) 0  
2012 [YR2012] Population ages 15-64, total  
0  
2011 [YR2011] Unemployment, youth female (% of female labor force ages 15-24) (modeled ILO estimate) 0  
Unemployment, total (% of total labor force) (modeled ILO estimate) 0  
Unemployment, male (% of male labor force) (modeled ILO estimate) 0  
Unemployment, female (% of female labor force) (modeled ILO estimate) 0  
Population, total  
0  
Population, male (% of total population)  
0  
2012 [YR2012] Population ages 15-64 (% of total population)  
0  
Population ages 65 and above (% of total population)  
0  
2011 [YR2011] Population, female (% of total population)  
0  
2012 [YR2012] Unemployment, male (% of male labor force) (modeled ILO estimate) 0  
2013 [YR2013] Age dependency ratio, old (% of working-age population)  
0  
Age dependency ratio (% of working-age population)  
0  
2012 [YR2012] Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate) 0  
Unemployment, youth male (% of male labor force ages 15-24) (modeled ILO estimate) 0  
Unemployment, youth female (% of female labor force ages 15-24) (modeled ILO estimate) 0  
Unemployment, total (% of total labor force) (modeled ILO estimate)

mate) 0  
timate) Unemployment, female (% of female labor force) (modeled ILO es  
0  
Population ages 65 and above, total  
0  
Population, total  
0  
Population, male (% of total population)  
0  
Population, male  
0  
Population, female (% of total population)  
0  
Population, female  
0  
Population growth (annual %)  
0  
2011 [YR2011] Population, male  
0  
Population, female  
0  
2013 [YR2013] Compulsory education, duration (years)  
0  
2010 [YR2010] Population ages 15-64, total  
0  
Population, male  
0  
Population, female (% of total population)  
0  
Population, female  
0  
Population growth (annual %)  
0  
Population ages 65 and above, total  
0  
Population ages 65 and above (% of total population)  
0  
Population ages 15-64 (% of total population)  
0  
Population, total  
0  
Population ages 0-14, total  
0  
Population ages 0-14 (% of total population)  
0  
Compulsory education, duration (years)  
0  
Age dependency ratio, young (% of working-age population)  
0  
Age dependency ratio, old (% of working-age population)  
0  
Age dependency ratio (% of working-age population)  
0  
Population, male (% of total population)  
0  
Unemployment, female (% of female labor force) (modeled ILO es  
timate) 0

2011 [YR2011] Population growth (annual %)  
0  
Compulsory education, duration (years)  
0  
Population ages 65 and above, total  
0  
Population ages 65 and above (% of total population)  
0  
Population ages 15-64, total  
0  
Population ages 15-64 (% of total population)  
0  
Population ages 0-14, total  
0  
Population ages 0-14 (% of total population)  
0  
Age dependency ratio, young (% of working-age population)  
0  
2010 [YR2010] Unemployment, male (% of male labor force) (modeled ILO estimate)  
0  
2011 [YR2011] Age dependency ratio, old (% of working-age population)  
0  
Age dependency ratio (% of working-age population)  
0  
2010 [YR2010] Unemployment, youth total (% of total labor force ages 15-24)  
(modeled ILO estimate) 0  
Unemployment, youth male (% of male labor force ages 15-24) (modeled ILO estimate) 0  
Unemployment, youth female (% of female labor force ages 15-24) (modeled ILO estimate) 0  
Unemployment, total (% of total labor force) (modeled ILO estimate) 0  
2013 [YR2013] Age dependency ratio, young (% of working-age population)  
0  
Population ages 0-14 (% of total population)  
0  
2016 [YR2016] Population ages 65 and above (% of total population)  
0  
2015 [YR2015] Population ages 0-14, total  
0  
Population, female  
0  
Population growth (annual %)  
0  
Population ages 65 and above, total  
0  
Population ages 65 and above (% of total population)  
0  
Population ages 15-64, total  
0  
Population ages 15-64 (% of total population)  
0  
Population ages 0-14 (% of total population)  
0  
Population, male  
0  
Compulsory education, duration (years)

0  
Age dependency ratio, young (% of working-age population)  
0  
Age dependency ratio, old (% of working-age population)  
0  
Age dependency ratio (% of working-age population)  
0  
2014 [YR2014] Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate) 0  
Unemployment, youth male (% of male labor force ages 15-24) (modeled ILO estimate) 0  
2015 [YR2015] Population, female (% of total population)  
0  
Population, male (% of total population)  
0  
2014 [YR2014] Unemployment, total (% of total labor force) (modeled ILO estimate) 0  
2016 [YR2016] Age dependency ratio, old (% of working-age population)  
0  
Population ages 15-64, total  
0  
Population ages 15-64 (% of total population)  
0  
Population ages 0-14, total  
0  
Population ages 0-14 (% of total population)  
0  
Compulsory education, duration (years)  
0  
Age dependency ratio, young (% of working-age population)  
0  
Age dependency ratio (% of working-age population)  
0  
2015 [YR2015] Population, total  
0  
Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate) 0  
Unemployment, youth male (% of male labor force ages 15-24) (modeled ILO estimate) 0  
Unemployment, youth female (% of female labor force ages 15-24) (modeled ILO estimate) 0  
Unemployment, total (% of total labor force) (modeled ILO estimate) 0  
Unemployment, male (% of male labor force) (modeled ILO estimate) 0  
Unemployment, female (% of female labor force) (modeled ILO estimate) 0  
2014 [YR2014] Unemployment, youth female (% of female labor force ages 15-24) (modeled ILO estimate) 0  
Unemployment, male (% of male labor force) (modeled ILO estimate) 0  
2013 [YR2013] Population ages 0-14, total  
0  
Population, male  
0  
Unemployment, youth female (% of female labor force ages 15-24) (modeled ILO estimate) 0

mate) Unemployment, total (% of total labor force) (modeled ILO esti  
0  
te) Unemployment, male (% of male labor force) (modeled ILO estima  
0  
timate) Unemployment, female (% of female labor force) (modeled ILO es  
0  
Population, total  
0  
Population, male (% of total population)  
0  
Population, female (% of total population)  
0  
Unemployment, youth total (% of total labor force ages 15-24)  
(modeled ILO estimate) 0  
Population, female  
0  
Population growth (annual %)  
0  
Population ages 65 and above, total  
0  
Population ages 65 and above (% of total population)  
0  
Population ages 15-64, total  
0  
Population ages 15-64 (% of total population)  
0  
Unemployment, youth male (% of male labor force ages 15-24) (m  
odeled ILO estimate) 0  
2014 [YR2014] Age dependency ratio (% of working-age population)  
0  
Unemployment, female (% of female labor force) (modeled ILO es  
timate) 0  
Population ages 65 and above, total  
0  
Population, total  
0  
Population, male (% of total population)  
0  
Population, male  
0  
Population, female (% of total population)  
0  
Population, female  
0  
Population growth (annual %)  
0  
Population ages 65 and above (% of total population)  
0  
Age dependency ratio, old (% of working-age population)  
0  
Population ages 15-64, total  
0  
Population ages 15-64 (% of total population)  
0  
Population ages 0-14, total  
0  
Population ages 0-14 (% of total population)

```

0          Compulsory education, duration (years)
0          Age dependency ratio, young (% of working-age population)
0
2022 [YR2022] Unemployment, youth total (% of total labor force ages 15-24)
(modeled ILO estimate)      0
dtype: int64

```

## Confirm accuracy of African countries

```
In [22]: # Create a List named 'africa' that contains the names of African countries
africa = ['Algeria', 'Angola', 'Benin', 'Botswana', 'Burkina Faso', 'Burundi',
'Cabo Verde', 'Cameroon', 'Central African Republic', 'Chad', 'Comoros',
'Democratic Republic of the Congo', 'Republic of the Congo', 'Djibouti',
'Egypt', 'Equatorial Guinea', 'Eritrea', 'Eswatini', 'Ethiopia',
'Gabon', 'Gambia', 'Ghana', 'Guinea', 'Guinea-Bissau', 'Côte d'Ivoire',
'Kenya', 'Lesotho', 'Liberia', 'Libya', 'Madagascar', 'Malawi',
'Mali', 'Mauritania', 'Mauritius', 'Morocco', 'Mozambique', 'Namibia',
'Niger', 'Nigeria', 'Rwanda', 'Sao Tome and Principe', 'Senegal',
'Seychelles', 'Sierra Leone', 'Somalia', 'South Africa', 'South Sudan',
'Sudan', 'Tanzania', 'Togo', 'Tunisia', 'Uganda', 'Zambia', 'Zimbabwe',]
```

```
In [23]: # Create a List named 'africa_check' that contains the names of countries in
# 'pivoted_df' that are not in the 'africa' list
africa_check = [col for col in pivoted_df['Country Name'] if col not in africa]

# Display the 'africa_check' list
africa_check
```

```
Out[23]: ['United Arab Emirates',
'Bahrain',
"Cote d'Ivoire",
'Congo, Dem. Rep.',
'Congo, Rep.',
'Egypt, Arab Rep.',
'Gambia, The',
'Iran, Islamic Rep.',
'Iraq',
'Israel',
'Jordan',
'Kuwait',
'Lebanon',
'Malta',
'Oman',
'West Bank and Gaza',
'Qatar',
'Saudi Arabia',
'Syrian Arab Republic',
'Yemen, Rep.]
```

```
In [24]: # Create a list named 'not_africa' that contains the names of non-African countries in the africa_check list  
not_africa = ['United Arab Emirates', 'Bahrain', 'Iran, Islamic Rep.', 'Iraq',  
             'Israel', 'Jordan', 'Kuwait', 'Lebanon', 'Malta', 'Oman', 'Qatar',  
             'Saudi Arabia', 'Syrian Arab Republic', 'West Bank and Gaza', 'Yemen, Rep.]
```

```
In [25]: # Drop the rows in 'pivoted_df' where the 'Country Name' is in the 'not_africa' list  
pivoted_df = pivoted_df.drop(pivoted_df[pivoted_df['Country Name'].isin(not_africa)].index)  
  
# Display the number of rows in 'pivoted_df' after dropping the rows  
len(pivoted_df)
```

Out[25]: 54

```
In [26]: pivoted_df.columns
```

Now our MultiIndex DataFrame is as clean as it can be

EDA

Let's take a look at what insights we can derive from our data.

```
In [27]: # Create a List named 'year' that contains the column names of 'pivoted_df'  
year = list(pivoted_df.columns)  
  
# Remove the first two elements from the 'year' list  
del year[0:2]  
  
# Display the 'year' List after the first two elements have been removed  
year
```

```
Out[27]: [(['2010 [YR2010]', 'Age dependency ratio (% of working-age population)'),  
          ('2010 [YR2010]', 'Age dependency ratio, old (% of working-age population)'),  
          ('2010 [YR2010]',  
           'Age dependency ratio, young (% of working-age population)'),  
          ('2010 [YR2010]', 'Compulsory education, duration (years)'),  
          ('2010 [YR2010]', 'Population ages 0-14 (% of total population)'),  
          ('2010 [YR2010]', 'Population ages 0-14, total'),  
          ('2010 [YR2010]', 'Population ages 15-64 (% of total population)'),  
          ('2010 [YR2010]', 'Population ages 15-64, total'),  
          ('2010 [YR2010]', 'Population ages 65 and above (% of total population)'),  
          ('2010 [YR2010]', 'Population ages 65 and above, total'),  
          ('2010 [YR2010]', 'Population growth (annual %)'),  
          ('2010 [YR2010]', 'Population, female'),  
          ('2010 [YR2010]', 'Population, female (% of total population)'),  
          ('2010 [YR2010]', 'Population, male'),  
          ('2010 [YR2010]', 'Population, male (% of total population)'),  
          ('2010 [YR2010]', 'Population, total'),  
          ('2010 [YR2010]',  
           'Unemployment, female (% of female labor force) (modeled ILO estimate)'),  
          ('2010 [YR2010]',  
           'Unemployment, male (% of male labor force) (modeled ILO estimate)'),  
          ('2010 [YR2010]',  
           'Unemployment, total (% of total labor force) (modeled ILO estimate)'),  
          ('2010 [YR2010]',  
           'Unemployment, youth female (% of female labor force ages 15-24) (modeled ILO estimate)'),  
          ('2010 [YR2010]',  
           'Unemployment, youth male (% of male labor force ages 15-24) (modeled ILO estimate)'),  
          ('2010 [YR2010]',  
           'Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)'),  
          ('2011 [YR2011]', 'Age dependency ratio (% of working-age population)'),  
          ('2011 [YR2011]', 'Age dependency ratio, old (% of working-age population)'),  
          ('2011 [YR2011]',  
           'Age dependency ratio, young (% of working-age population)'),  
          ('2011 [YR2011]', 'Compulsory education, duration (years)'),  
          ('2011 [YR2011]', 'Population ages 0-14 (% of total population)'),  
          ('2011 [YR2011]', 'Population ages 0-14, total'),  
          ('2011 [YR2011]', 'Population ages 15-64 (% of total population)'),  
          ('2011 [YR2011]', 'Population ages 15-64, total'),  
          ('2011 [YR2011]', 'Population ages 65 and above (% of total population)'),  
          ('2011 [YR2011]', 'Population ages 65 and above, total'),  
          ('2011 [YR2011]', 'Population growth (annual %)'),  
          ('2011 [YR2011]', 'Population, female'),  
          ('2011 [YR2011]', 'Population, female (% of total population)'),  
          ('2011 [YR2011]', 'Population, male'),  
          ('2011 [YR2011]', 'Population, male (% of total population)'),  
          ('2011 [YR2011]', 'Population, total'),  
          ('2011 [YR2011]',  
           'Unemployment, female (% of female labor force) (modeled ILO estimate)'),  
          ('2011 [YR2011]',  
           'Unemployment, male (% of male labor force) (modeled ILO estimate)'),  
          ('2011 [YR2011]',  
           'Unemployment, total (% of total labor force) (modeled ILO estimate)'),
```

('2011 [YR2011]',  
    'Unemployment, youth female (% of female labor force ages 15-24) (modeled ILO estimate)'),  
    ('2011 [YR2011]',  
        'Unemployment, youth male (% of male labor force ages 15-24) (modeled ILO estimate)'),  
    ('2011 [YR2011]',  
        'Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)'),  
    ('2012 [YR2012]', 'Age dependency ratio (% of working-age population)'),  
    ('2012 [YR2012]', 'Age dependency ratio, old (% of working-age population)'),  
    ('2012 [YR2012]',  
        'Age dependency ratio, young (% of working-age population)'),  
    ('2012 [YR2012]', 'Compulsory education, duration (years)'),  
    ('2012 [YR2012]', 'Population ages 0-14 (% of total population)'),  
    ('2012 [YR2012]', 'Population ages 0-14, total'),  
    ('2012 [YR2012]', 'Population ages 15-64 (% of total population)'),  
    ('2012 [YR2012]', 'Population ages 15-64, total'),  
    ('2012 [YR2012]', 'Population ages 65 and above (% of total population)'),  
    ('2012 [YR2012]', 'Population ages 65 and above, total'),  
    ('2012 [YR2012]', 'Population growth (annual %)'),  
    ('2012 [YR2012]', 'Population, female'),  
    ('2012 [YR2012]', 'Population, female (% of total population)'),  
    ('2012 [YR2012]', 'Population, male'),  
    ('2012 [YR2012]', 'Population, male (% of total population)'),  
    ('2012 [YR2012]', 'Population, total'),  
    ('2012 [YR2012]',  
        'Unemployment, female (% of female labor force) (modeled ILO estimate)'),  
    ('2012 [YR2012]',  
        'Unemployment, male (% of male labor force) (modeled ILO estimate)'),  
    ('2012 [YR2012]',  
        'Unemployment, total (% of total labor force) (modeled ILO estimate)'),  
    ('2012 [YR2012]',  
        'Unemployment, youth female (% of female labor force ages 15-24) (modeled ILO estimate)'),  
    ('2012 [YR2012]',  
        'Unemployment, youth male (% of male labor force ages 15-24) (modeled ILO estimate)'),  
    ('2012 [YR2012]',  
        'Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)'),  
    ('2013 [YR2013]', 'Age dependency ratio (% of working-age population)'),  
    ('2013 [YR2013]', 'Age dependency ratio, old (% of working-age population)'),  
    ('2013 [YR2013]',  
        'Age dependency ratio, young (% of working-age population)'),  
    ('2013 [YR2013]', 'Compulsory education, duration (years)'),  
    ('2013 [YR2013]', 'Population ages 0-14 (% of total population)'),  
    ('2013 [YR2013]', 'Population ages 0-14, total'),  
    ('2013 [YR2013]', 'Population ages 15-64 (% of total population)'),  
    ('2013 [YR2013]', 'Population ages 15-64, total'),  
    ('2013 [YR2013]', 'Population ages 65 and above (% of total population)'),  
    ('2013 [YR2013]', 'Population ages 65 and above, total'),  
    ('2013 [YR2013]', 'Population growth (annual %)'),  
    ('2013 [YR2013]', 'Population, female'),  
    ('2013 [YR2013]', 'Population, female (% of total population)'),

```
('2013 [YR2013]', 'Population, male'),
('2013 [YR2013]', 'Population, male (% of total population)'),
('2013 [YR2013]', 'Population, total'),
('2013 [YR2013]',
 'Unemployment, female (% of female labor force) (modeled ILO estimate)'),
('2013 [YR2013]',
 'Unemployment, male (% of male labor force) (modeled ILO estimate)'),
('2013 [YR2013]',
 'Unemployment, total (% of total labor force) (modeled ILO estimate)'),
('2013 [YR2013]',
 'Unemployment, youth female (% of female labor force ages 15-24) (modeled ILO estimate)'),
('2013 [YR2013]',
 'Unemployment, youth male (% of male labor force ages 15-24) (modeled ILO estimate)'),
('2013 [YR2013]',
 'Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)'),
('2014 [YR2014]', 'Age dependency ratio (% of working-age population)'),
('2014 [YR2014]', 'Age dependency ratio, old (% of working-age population)'),
('2014 [YR2014]',
 'Age dependency ratio, young (% of working-age population)'),
('2014 [YR2014]', 'Compulsory education, duration (years)'),
('2014 [YR2014]', 'Population ages 0-14 (% of total population)'),
('2014 [YR2014]', 'Population ages 0-14, total'),
('2014 [YR2014]', 'Population ages 15-64 (% of total population)'),
('2014 [YR2014]', 'Population ages 15-64, total'),
('2014 [YR2014]', 'Population ages 65 and above (% of total population)'),
('2014 [YR2014]', 'Population ages 65 and above, total'),
('2014 [YR2014]', 'Population growth (annual %)'),
('2014 [YR2014]', 'Population, female'),
('2014 [YR2014]', 'Population, female (% of total population)'),
('2014 [YR2014]', 'Population, male'),
('2014 [YR2014]', 'Population, male (% of total population)'),
('2014 [YR2014]', 'Population, total'),
('2014 [YR2014]',
 'Unemployment, female (% of female labor force) (modeled ILO estimate)'),
('2014 [YR2014]',
 'Unemployment, male (% of male labor force) (modeled ILO estimate)'),
('2014 [YR2014]',
 'Unemployment, total (% of total labor force) (modeled ILO estimate)'),
('2014 [YR2014]',
 'Unemployment, youth female (% of female labor force ages 15-24) (modeled ILO estimate)'),
('2014 [YR2014]',
 'Unemployment, youth male (% of male labor force ages 15-24) (modeled ILO estimate)'),
('2014 [YR2014]',
 'Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)'),
('2015 [YR2015]', 'Age dependency ratio (% of working-age population)'),
('2015 [YR2015]', 'Age dependency ratio, old (% of working-age population)'),
('2015 [YR2015]',
 'Age dependency ratio, young (% of working-age population)'),
('2015 [YR2015]', 'Compulsory education, duration (years)'),
```

('2015 [YR2015]', 'Population ages 0-14 (% of total population)'),  
('2015 [YR2015]', 'Population ages 0-14, total'),  
('2015 [YR2015]', 'Population ages 15-64 (% of total population)'),  
('2015 [YR2015]', 'Population ages 15-64, total'),  
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('2015 [YR2015]', 'Population ages 65 and above, total'),  
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('2015 [YR2015]', 'Population, female (% of total population)'),  
('2015 [YR2015]', 'Population, male'),  
('2015 [YR2015]', 'Population, male (% of total population)'),  
('2015 [YR2015]', 'Population, total'),  
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('2015 [YR2015]',  
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('2015 [YR2015]',  
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('2015 [YR2015]',  
 'Unemployment, youth male (% of male labor force ages 15-24) (modeled ILO estimate)'),  
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 'Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)'),  
('2016 [YR2016]', 'Age dependency ratio (% of working-age population)'),  
('2016 [YR2016]', 'Age dependency ratio, old (% of working-age population)'),  
('2016 [YR2016]',  
 'Age dependency ratio, young (% of working-age population)'),  
('2016 [YR2016]', 'Compulsory education, duration (years)'),  
('2016 [YR2016]', 'Population ages 0-14 (% of total population)'),  
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('2016 [YR2016]', 'Population ages 15-64 (% of total population)'),  
('2016 [YR2016]', 'Population ages 15-64, total'),  
('2016 [YR2016]', 'Population ages 65 and above (% of total population)'),  
('2016 [YR2016]', 'Population ages 65 and above, total'),  
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('2016 [YR2016]', 'Population, female (% of total population)'),  
('2016 [YR2016]', 'Population, male'),  
('2016 [YR2016]', 'Population, male (% of total population)'),  
('2016 [YR2016]', 'Population, total'),  
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('2016 [YR2016]',  
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'Unemployment, male (% of male labor force) (modeled ILO estimate)'),  
('2018 [YR2018]'),  
'Unemployment, total (% of total labor force) (modeled ILO estimate)'),  
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'Unemployment, youth male (% of male labor force ages 15-24) (modeled ILO estimate)'),  
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'Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)'),  
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('2019 [YR2019]'), 'Age dependency ratio, old (% of working-age population)'),  
('2019 [YR2019]'),  
'Age dependency ratio, young (% of working-age population)'),  
('2019 [YR2019]'), 'Compulsory education, duration (years)'),  
('2019 [YR2019]'), 'Population ages 0-14 (% of total population)'),  
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('2019 [YR2019]'), 'Population ages 15-64 (% of total population)'),  
('2019 [YR2019]'), 'Population ages 15-64, total'),  
('2019 [YR2019]'), 'Population ages 65 and above (% of total population)'),  
('2019 [YR2019]'), 'Population ages 65 and above, total'),  
('2019 [YR2019]'), 'Population growth (annual %)'),  
('2019 [YR2019]'), 'Population, female'),  
('2019 [YR2019]'), 'Population, female (% of total population)'),  
('2019 [YR2019]'), 'Population, male'),  
('2019 [YR2019]'), 'Population, male (% of total population)'),  
('2019 [YR2019]'), 'Population, total'),  
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('2019 [YR2019]'),  
'Unemployment, male (% of male labor force) (modeled ILO estimate)'),  
('2019 [YR2019]'),  
'Unemployment, total (% of total labor force) (modeled ILO estimate)'),  
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('2019 [YR2019]'),  
'Unemployment, youth male (% of male labor force ages 15-24) (modeled ILO estimate)'),  
('2019 [YR2019]'),  
'Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)'),  
('2020 [YR2020]'), 'Age dependency ratio (% of working-age population)'),  
('2020 [YR2020]'), 'Age dependency ratio, old (% of working-age population)'),  
('2020 [YR2020]'),  
'Age dependency ratio, young (% of working-age population)'),  
('2020 [YR2020]'), 'Compulsory education, duration (years)'),  
('2020 [YR2020]'), 'Population ages 0-14 (% of total population)'),  
('2020 [YR2020]'), 'Population ages 0-14, total'),  
('2020 [YR2020]'), 'Population ages 15-64 (% of total population)'),  
('2020 [YR2020]'), 'Population ages 15-64, total'),  
('2020 [YR2020]'), 'Population ages 65 and above (% of total population)'),  
('2020 [YR2020]'), 'Population ages 65 and above, total'),

```

('2020 [YR2020]', 'Population growth (annual %)'),
('2020 [YR2020]', 'Population, female'),
('2020 [YR2020]', 'Population, female (% of total population)'),
('2020 [YR2020]', 'Population, male'),
('2020 [YR2020]', 'Population, male (% of total population)'),
('2020 [YR2020]', 'Population, total'),
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('2020 [YR2020]', 'Unemployment, male (% of male labor force) (modeled ILO estimate)'),
('2020 [YR2020]', 'Unemployment, total (% of total labor force) (modeled ILO estimate)'),
('2020 [YR2020]', 'Unemployment, youth female (% of female labor force ages 15-24) (modeled ILO estimate)'),
('2020 [YR2020]', 'Unemployment, youth male (% of male labor force ages 15-24) (modeled ILO estimate)'),
('2020 [YR2020]', 'Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)'),
('2021 [YR2021]', 'Age dependency ratio (% of working-age population)'),
('2021 [YR2021]', 'Age dependency ratio, old (% of working-age population)'),
('2021 [YR2021]', 'Age dependency ratio, young (% of working-age population)'),
('2021 [YR2021]', 'Compulsory education, duration (years)'),
('2021 [YR2021]', 'Population ages 0-14 (% of total population)'),
('2021 [YR2021]', 'Population ages 0-14, total'),
('2021 [YR2021]', 'Population ages 15-64 (% of total population)'),
('2021 [YR2021]', 'Population ages 15-64, total'),
('2021 [YR2021]', 'Population ages 65 and above (% of total population)'),
('2021 [YR2021]', 'Population ages 65 and above, total'),
('2021 [YR2021]', 'Population growth (annual %)'),
('2021 [YR2021]', 'Population, female'),
('2021 [YR2021]', 'Population, female (% of total population)'),
('2021 [YR2021]', 'Population, male'),
('2021 [YR2021]', 'Population, male (% of total population)'),
('2021 [YR2021]', 'Population, total'),
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('2021 [YR2021]', 'Unemployment, male (% of male labor force) (modeled ILO estimate)'),
('2021 [YR2021]', 'Unemployment, total (% of total labor force) (modeled ILO estimate)'),
('2021 [YR2021]', 'Unemployment, youth female (% of female labor force ages 15-24) (modeled ILO estimate)'),
('2021 [YR2021]', 'Unemployment, youth male (% of male labor force ages 15-24) (modeled ILO estimate)'),
('2021 [YR2021]', 'Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)'),
('2022 [YR2022]', 'Age dependency ratio (% of working-age population)'),
('2022 [YR2022]', 'Age dependency ratio, old (% of working-age population)'),

```

```
('2022 [YR2022]',  
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('2022 [YR2022]', 'Compulsory education, duration (years)'),  
('2022 [YR2022]', 'Population ages 0-14 (% of total population)'),  
('2022 [YR2022]', 'Population ages 0-14, total'),  
('2022 [YR2022]', 'Population ages 15-64 (% of total population)'),  
('2022 [YR2022]', 'Population ages 15-64, total'),  
('2022 [YR2022]', 'Population ages 65 and above (% of total population)'),  
('2022 [YR2022]', 'Population ages 65 and above, total'),  
('2022 [YR2022]', 'Population growth (annual %)'),  
('2022 [YR2022]', 'Population, female'),  
('2022 [YR2022]', 'Population, female (% of total population)'),  
('2022 [YR2022]', 'Population, male'),  
('2022 [YR2022]', 'Population, male (% of total population)'),  
('2022 [YR2022]', 'Population, total'),  
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('2022 [YR2022]',  
 'Unemployment, male (% of male labor force) (modeled ILO estimate)'),  
('2022 [YR2022]',  
 'Unemployment, total (% of total labor force) (modeled ILO estimate)'),  
('2022 [YR2022]',  
 'Unemployment, youth female (% of female labor force ages 15-24) (modeled I  
LO estimate)'),  
('2022 [YR2022]',  
 'Unemployment, youth male (% of male labor force ages 15-24) (modeled ILO e  
stimate)'),  
('2022 [YR2022]',  
 'Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO  
estimate)'])
```

```
In [29]: # Create a List named 'drop_col' that contains the names of the columns to be
# dropped from the DataFrame 'pivoted_df'
drop_col = ['Population ages 0-14, total', 'Population ages 15-64, total', 'Po
pulation ages 65 and above, total', 'Population, female',
            'Population, female (% of total population)', 'Population, male',
'Population, male (% of total population)',
            'Unemployment, youth female (% of female labor force ages 15-24)
(modeled ILO estimate)',
            'Unemployment, youth male (% of male labor force ages 15-24) (mode
led ILO estimate)',
            'Unemployment, youth total (% of total labor force ages 15-24) (mo
deled ILO estimate)']

# Create an empty List named 'drop_c'
drop_c = []

# Iterate over each element in the 'drop_col' list
for i in drop_col:
    # For each column in the 'year' list, check if the element from 'drop_col'
    # is in the column name
    for col in year:
        # If the element from 'drop_col' is in the column name, add the column
        # name to the 'drop_c' list
        if i in col:
            drop_c.append(col)

# Display the 'drop_c' list
drop_c
```

Out[29]: (54, 158)

```
In [ ]: # Drop the columns in 'pivoted_df' that are in the 'drop_c' list
pivoted_df = pivoted_df.drop(drop_c, axis=1)

# Display the shape of 'pivoted_df' after dropping the columns
pivoted_df.shape
```

```
In [30]: # Update the year variable
year = list(pivoted_df.columns)
del year[0:2]
year
```

```
Out[30]: [(['2010 [YR2010]', 'Age dependency ratio (% of working-age population)'),  
          ('2010 [YR2010]', 'Age dependency ratio, old (% of working-age population)'),  
          ('2010 [YR2010]',  
           'Age dependency ratio, young (% of working-age population)'),  
          ('2010 [YR2010]', 'Compulsory education, duration (years)'),  
          ('2010 [YR2010]', 'Population ages 0-14 (% of total population)'),  
          ('2010 [YR2010]', 'Population ages 15-64 (% of total population)'),  
          ('2010 [YR2010]', 'Population ages 65 and above (% of total population)'),  
          ('2010 [YR2010]', 'Population growth (annual %)'),  
          ('2010 [YR2010]', 'Population, total'),  
          ('2010 [YR2010]',  
           'Unemployment, female (% of female labor force) (modeled ILO estimate)'),  
          ('2010 [YR2010]',  
           'Unemployment, male (% of male labor force) (modeled ILO estimate)'),  
          ('2010 [YR2010]',  
           'Unemployment, total (% of total labor force) (modeled ILO estimate)'),  
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          ('2011 [YR2011]', 'Age dependency ratio, old (% of working-age population)'),  
          ('2011 [YR2011]',  
           'Age dependency ratio, young (% of working-age population)'),  
          ('2011 [YR2011]', 'Compulsory education, duration (years)'),  
          ('2011 [YR2011]', 'Population ages 0-14 (% of total population)'),  
          ('2011 [YR2011]', 'Population ages 15-64 (% of total population)'),  
          ('2011 [YR2011]', 'Population ages 65 and above (% of total population)'),  
          ('2011 [YR2011]', 'Population growth (annual %)'),  
          ('2011 [YR2011]', 'Population, total'),  
          ('2011 [YR2011]',  
           'Unemployment, female (% of female labor force) (modeled ILO estimate)'),  
          ('2011 [YR2011]',  
           'Unemployment, male (% of male labor force) (modeled ILO estimate)'),  
          ('2011 [YR2011]',  
           'Unemployment, total (% of total labor force) (modeled ILO estimate)'),  
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          ('2012 [YR2012]', 'Age dependency ratio, old (% of working-age population)'),  
          ('2012 [YR2012]',  
           'Age dependency ratio, young (% of working-age population)'),  
          ('2012 [YR2012]', 'Compulsory education, duration (years)'),  
          ('2012 [YR2012]', 'Population ages 0-14 (% of total population)'),  
          ('2012 [YR2012]', 'Population ages 15-64 (% of total population)'),  
          ('2012 [YR2012]', 'Population ages 65 and above (% of total population)'),  
          ('2012 [YR2012]', 'Population growth (annual %)'),  
          ('2012 [YR2012]', 'Population, total'),  
          ('2012 [YR2012]',  
           'Unemployment, female (% of female labor force) (modeled ILO estimate)'),  
          ('2012 [YR2012]',  
           'Unemployment, male (% of male labor force) (modeled ILO estimate)'),  
          ('2012 [YR2012]',  
           'Unemployment, total (% of total labor force) (modeled ILO estimate)'),  
          ('2013 [YR2013]', 'Age dependency ratio (% of working-age population)'),  
          ('2013 [YR2013]', 'Age dependency ratio, old (% of working-age population)'),  
          ('2013 [YR2013]',  
           'Age dependency ratio, young (% of working-age population)'),  
          ('2013 [YR2013]', 'Compulsory education, duration (years)'),
```

('2013 [YR2013]', 'Population ages 0-14 (% of total population)'),  
('2013 [YR2013]', 'Population ages 15-64 (% of total population)'),  
('2013 [YR2013]', 'Population ages 65 and above (% of total population)'),  
('2013 [YR2013]', 'Population growth (annual %)'),  
('2013 [YR2013]', 'Population, total'),  
('2013 [YR2013]',  
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('2013 [YR2013]',  
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n)'),  
('2014 [YR2014]',  
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('2014 [YR2014]', 'Compulsory education, duration (years)'),  
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('2014 [YR2014]', 'Population ages 65 and above (% of total population)'),  
('2014 [YR2014]', 'Population growth (annual %)'),  
('2014 [YR2014]', 'Population, total'),  
('2014 [YR2014]',  
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('2014 [YR2014]',  
 'Unemployment, male (% of male labor force) (modeled ILO estimate)'),  
('2014 [YR2014]',  
 'Unemployment, total (% of total labor force) (modeled ILO estimate)'),  
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('2015 [YR2015]', 'Age dependency ratio, old (% of working-age populatio  
n)'),  
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('2015 [YR2015]',  
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('2016 [YR2016]', 'Age dependency ratio, old (% of working-age populatio  
n)'),  
('2016 [YR2016]',  
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('2016 [YR2016]', 'Compulsory education, duration (years)'),  
('2016 [YR2016]', 'Population ages 0-14 (% of total population)'),  
('2016 [YR2016]', 'Population ages 15-64 (% of total population)'),  
('2016 [YR2016]', 'Population ages 65 and above (% of total population)'),  
('2016 [YR2016]', 'Population growth (annual %)'),  
('2016 [YR2016]', 'Population, total'),  
('2016 [YR2016]',

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'Unemployment, female (% of female labor force) (modeled ILO estimate)'),  
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('2017 [YR2017]', 'Age dependency ratio, old (% of working-age populatio  
n)'),  
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('2017 [YR2017]', 'Population growth (annual %)'),  
('2017 [YR2017]', 'Population, total'),  
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 'Unemployment, male (% of male labor force) (modeled ILO estimate)'),  
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('2018 [YR2018]', 'Age dependency ratio, old (% of working-age populatio  
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('2018 [YR2018]',  
 'Age dependency ratio, young (% of working-age population)'),  
('2018 [YR2018]', 'Compulsory education, duration (years)'),  
('2018 [YR2018]', 'Population ages 0-14 (% of total population)'),  
('2018 [YR2018]', 'Population ages 15-64 (% of total population)'),  
('2018 [YR2018]', 'Population ages 65 and above (% of total population)'),  
('2018 [YR2018]', 'Population growth (annual %)'),  
('2018 [YR2018]', 'Population, total'),  
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('2018 [YR2018]',  
 'Unemployment, male (% of male labor force) (modeled ILO estimate)'),  
('2018 [YR2018]',  
 'Unemployment, total (% of total labor force) (modeled ILO estimate)'),  
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('2019 [YR2019]', 'Age dependency ratio, old (% of working-age populatio  
n)'),  
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 'Age dependency ratio, young (% of working-age population)'),  
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('2019 [YR2019]', 'Population ages 65 and above (% of total population)'),  
('2019 [YR2019]', 'Population growth (annual %)'),  
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('2019 [YR2019]',  
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('2019 [YR2019]',  
 'Unemployment, male (% of male labor force) (modeled ILO estimate)'),  
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 'Unemployment, total (% of total labor force) (modeled ILO estimate)'),  
('2020 [YR2020]', 'Age dependency ratio (% of working-age population)'),
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('2020 [YR2020]', 'Age dependency ratio, old (% of working-age population)'),
('2020 [YR2020]', 'Age dependency ratio, young (% of working-age population)'),
('2020 [YR2020]', 'Compulsory education, duration (years)'),
('2020 [YR2020]', 'Population ages 0-14 (% of total population)'),
('2020 [YR2020]', 'Population ages 15-64 (% of total population)'),
('2020 [YR2020]', 'Population ages 65 and above (% of total population)'),
('2020 [YR2020]', 'Population growth (annual %)'),
('2020 [YR2020]', 'Population, total'),
('2020 [YR2020]', 'Unemployment, female (% of female labor force) (modeled ILO estimate)'),
('2020 [YR2020]', 'Unemployment, male (% of male labor force) (modeled ILO estimate)'),
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('2021 [YR2021]', 'Age dependency ratio, old (% of working-age population)'),
('2021 [YR2021]', 'Age dependency ratio, young (% of working-age population)'),
('2021 [YR2021]', 'Compulsory education, duration (years)'),
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('2021 [YR2021]', 'Population ages 15-64 (% of total population)'),
('2021 [YR2021]', 'Population ages 65 and above (% of total population)'),
('2021 [YR2021]', 'Population growth (annual %)'),
('2021 [YR2021]', 'Population, total'),
('2021 [YR2021]', 'Unemployment, female (% of female labor force) (modeled ILO estimate)'),
('2021 [YR2021]', 'Unemployment, male (% of male labor force) (modeled ILO estimate)'),
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('2022 [YR2022]', 'Age dependency ratio, old (% of working-age population'),
('2022 [YR2022]', 'Age dependency ratio, young (% of working-age population)'),
('2022 [YR2022]', 'Compulsory education, duration (years)'),
('2022 [YR2022]', 'Population ages 0-14 (% of total population)'),
('2022 [YR2022]', 'Population ages 15-64 (% of total population)'),
('2022 [YR2022]', 'Population ages 65 and above (% of total population)'),
('2022 [YR2022]', 'Population growth (annual %)'),
('2022 [YR2022]', 'Population, total'),
('2022 [YR2022]', 'Unemployment, female (% of female labor force) (modeled ILO estimate)'),
('2022 [YR2022]', 'Unemployment, male (% of male labor force) (modeled ILO estimate)'),
('2022 [YR2022]', 'Unemployment, total (% of total labor force) (modeled ILO estimate)'])
```

In [58]: `type(pivoted_df)`

Out[58]: `pandas.core.frame.DataFrame`

```
In [56]: # Define a function named 'plot_bar' that takes four parameters: 'year', 'df', 'indicator', and 'plot_type'
def plot_bar(year, df, indicator, plot_type):
    """This function is used to create a series of bar plots for a specified indicator over multiple years.
    Each bar plot shows the percentage values for different countries
    args:
        year (list): A list that contains the column names of 'pivoted_df'.
        df (DataFrame): The dataset that is going to be used for the analysis.
        indicator (str): A string used to filter the dataframe.
        plot_type (sns.barplot): A seaborn barplot object.

    Returns:
        plt.show(object): A visual representation of the barplot.
    """
# Import the 'math' module for mathematical operations
import math

# Get the number of years for which the specified indicator's data is available
# This is done by checking if the indicator is in each year in the 'year' list
num_years = len([i for i in year if indicator in i[0]])

# Create a list of years where the specified indicator's data is available
year_10 = [yr for yr in year if indicator in yr[0]]

# Calculate the number of rows needed for the subplots
# The number of rows is the ceiling of the number of years divided by 2
# This means that there will be 2 columns of subplots
num_rows = math.ceil(num_years / 2)

# Create a figure with the calculated number of rows and 2 columns
# The size of the figure is 20 units wide and 7 units tall for each row
fig, axs = plt.subplots(num_rows, 2, figsize=(20, 7 * num_rows))

# Flatten the axes array to make iterating over it easier
axs = axs.flatten()

# Iterate over the years and the axes simultaneously
for ax, yr in zip(axs, year_10):
    # If the indicator is in the year, create a bar plot for that year
    if indicator in yr:
        # The x-values are the country names, the y-values are the data for the year, and the plot is added to the current axes
        plot_type(x=df['Country Name'], y=df[yr], ax=ax)

    # Set the x-label to 'Country Names'
    ax.set_xlabel('Country Names')

    # Set the y-label to 'Percentage'
    ax.set_ylabel('Percentage')
```

```
# Set the title to the year
ax.set_title(f'{yr}')

# For each x-tick label, rotate it 90 degrees and set the font size to 8
for label in ax.get_xticklabels():
    label.set_rotation(90)
    label.set_fontsize(8)

# If the number of years is not even, remove the last subplot as it is unused
if num_years % 2 != 0:
    fig.delaxes(axs[-1])

# Adjust the layout so that the subplots do not overlap
plt.tight_layout()

# Display the figure
plt.show()
```

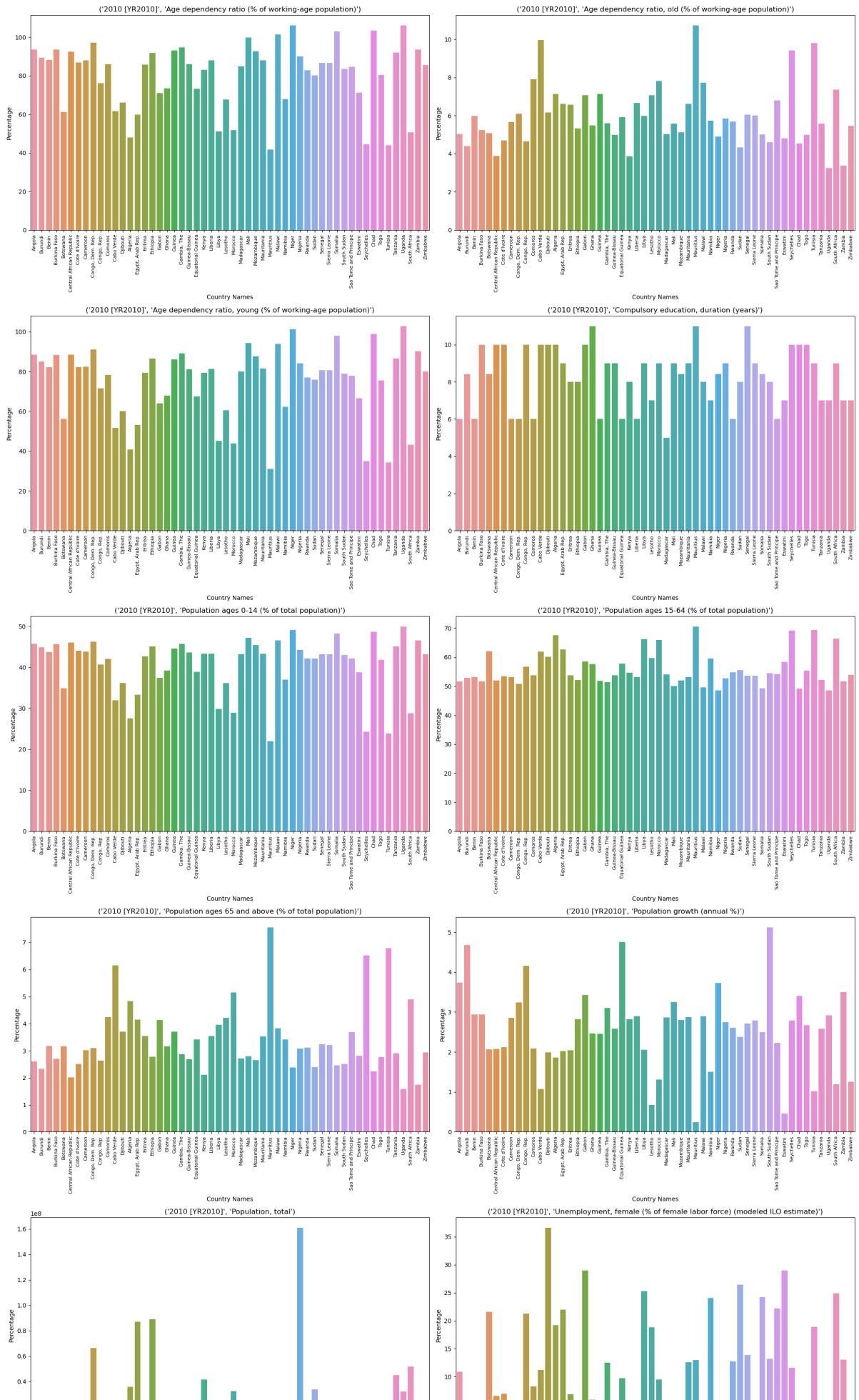
```
In [33]: # Define the indicator and the type of plot
# The indicator is set to '2010 [YR2010]', which means the data for the year 2010 will be used
indicator = '2010 [YR2010]'

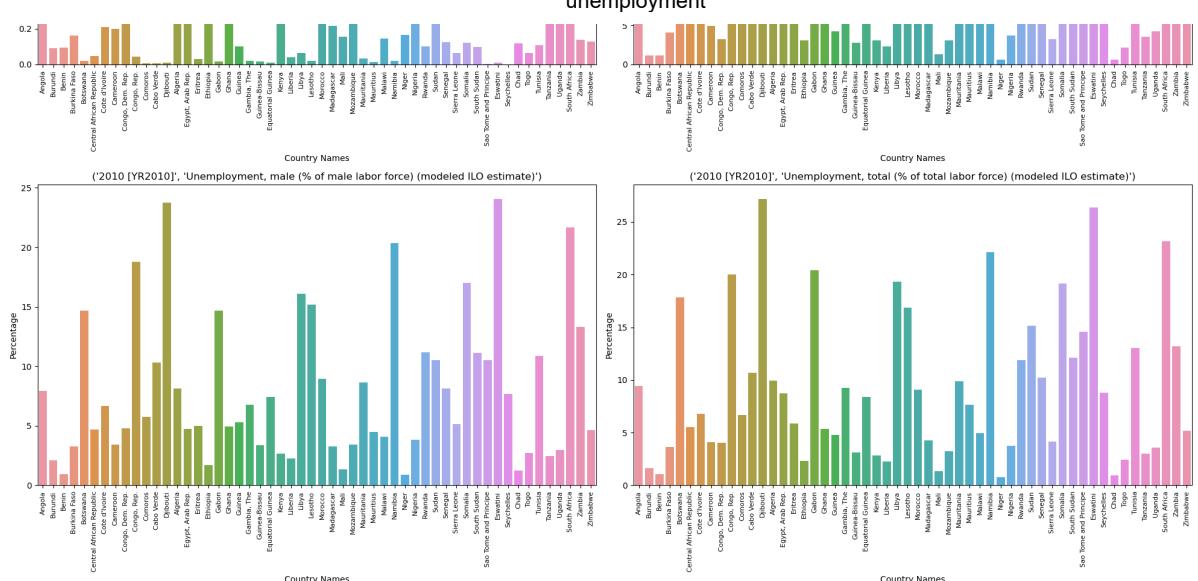
# The plot type is set to seaborn's barplot function
plot_type = sns.barplot

# Call the 'plot_bar' function with the specified year, DataFrame, indicator,
# and plot type
# The function will create a series of bar plots for the specified indicator over multiple years
# Each bar plot will show the percentage values for different countries
plot_bar(year, pivoted_df, indicator, plot_type)
```



unemployment





# Insights from year 2010

## Unemployment (Total % of labor force)

The percentage of the total labor force that is not currently employed but is available for and seeking employment

- High
  - 1. Djibouti - 25% +
  - 2. Eswatini - 25% +
  - 3. South Africa - 23% +

## Age dependency ratio

The Age Dependency Ratio is an economic metric that measures the ratio of dependents to the working-age population.

### Total Age Dependency rate

- High
  - 1. Niger - 100% +
  - 2. Uganda - 100% +
  - 3. Chad - 100% +
- Low
  - 1. Mauritius 30%+
  - 2. Tunisia 30%+
  - 3. Seychelles 30%+
- Old (High)
  - 1. Mauritius - 10(100)%
  - 2. Cabo verde - 9(90% +)
  - 3. Tunisia - 9(90% +)
- (Low)
  - 1. Uganda - 30% +
  - 2. Zambia - 30% +
  - 3. Kenya - 30% +
- Young (High)
  - 1. Uganda - 100% +
  - 2. Niger - 90%+
  - 3. Chad - 90%+
- (low)
  - 1. Mauritius 30%+
  - 2. Tunisia 30%+
  - A. Seychelles 30%+

## Conclusion

High unemployment rates combined with a high Age Dependency Ratio can have significant policy implications. Governments may need to consider policies to increase employment rates, improve job skills among the working-age population.

## Compulsory Education Duration Statistics

- 6years - 8
- 6years (greater than & less than or equal to 7years) - 13
- 8years - 1
- 8years (greater than & less than or equal to 10years) - 26
- 10years (greater than 10) - 3 ##### Conclusion Longer periods of compulsory education can lead to a more skilled workforce. These skills can make individuals more competitive in the job market, potentially reducing unemployment rates.

## Total Population

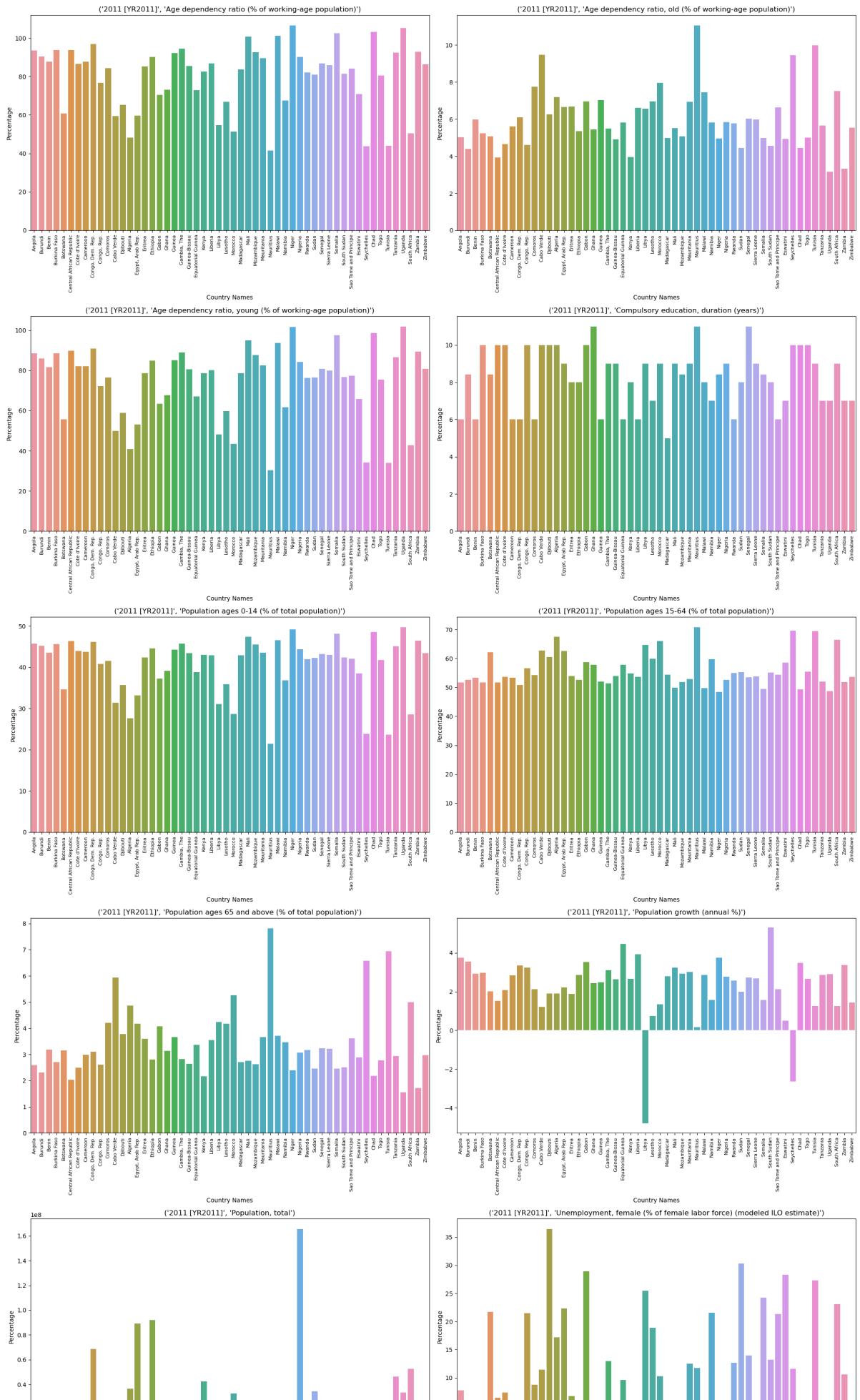
The total population refers to the total number of humans currently living on each of these countries within the time line in focus(2010) High:

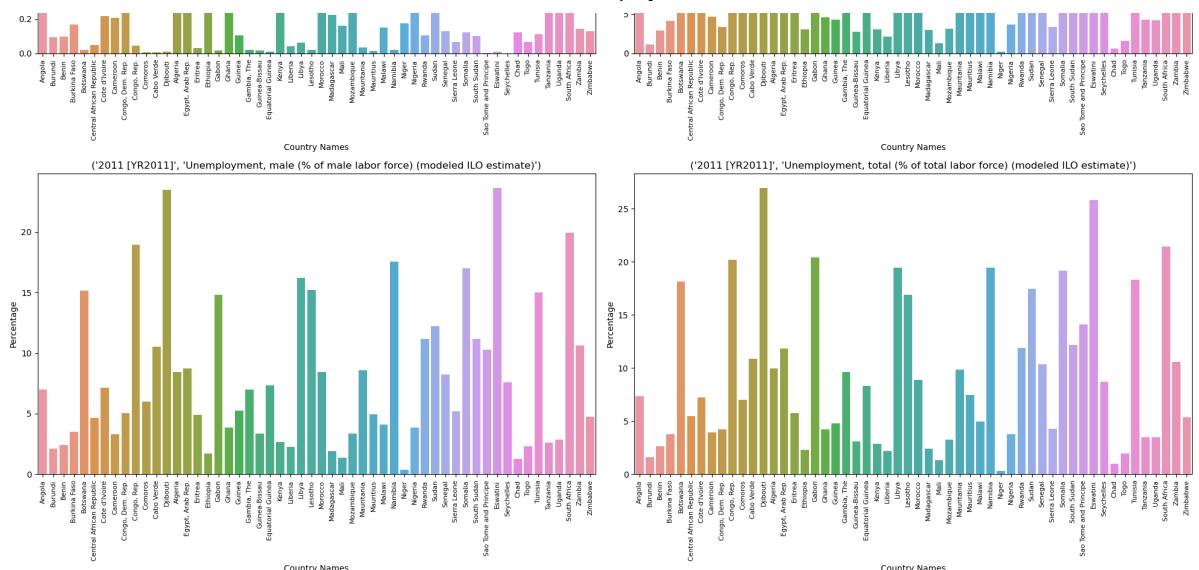
1. Nigeria - 1.6le8
2. Ethiopia - 0.8le8+
3. Egypt - 0.8le8+

## 2011

```
In [35]: indicator = '2011 [YR2011]'  
plot_type = sns.barplot  
  
plot_bar(year, pivoted_df, indicator, plot_type)
```



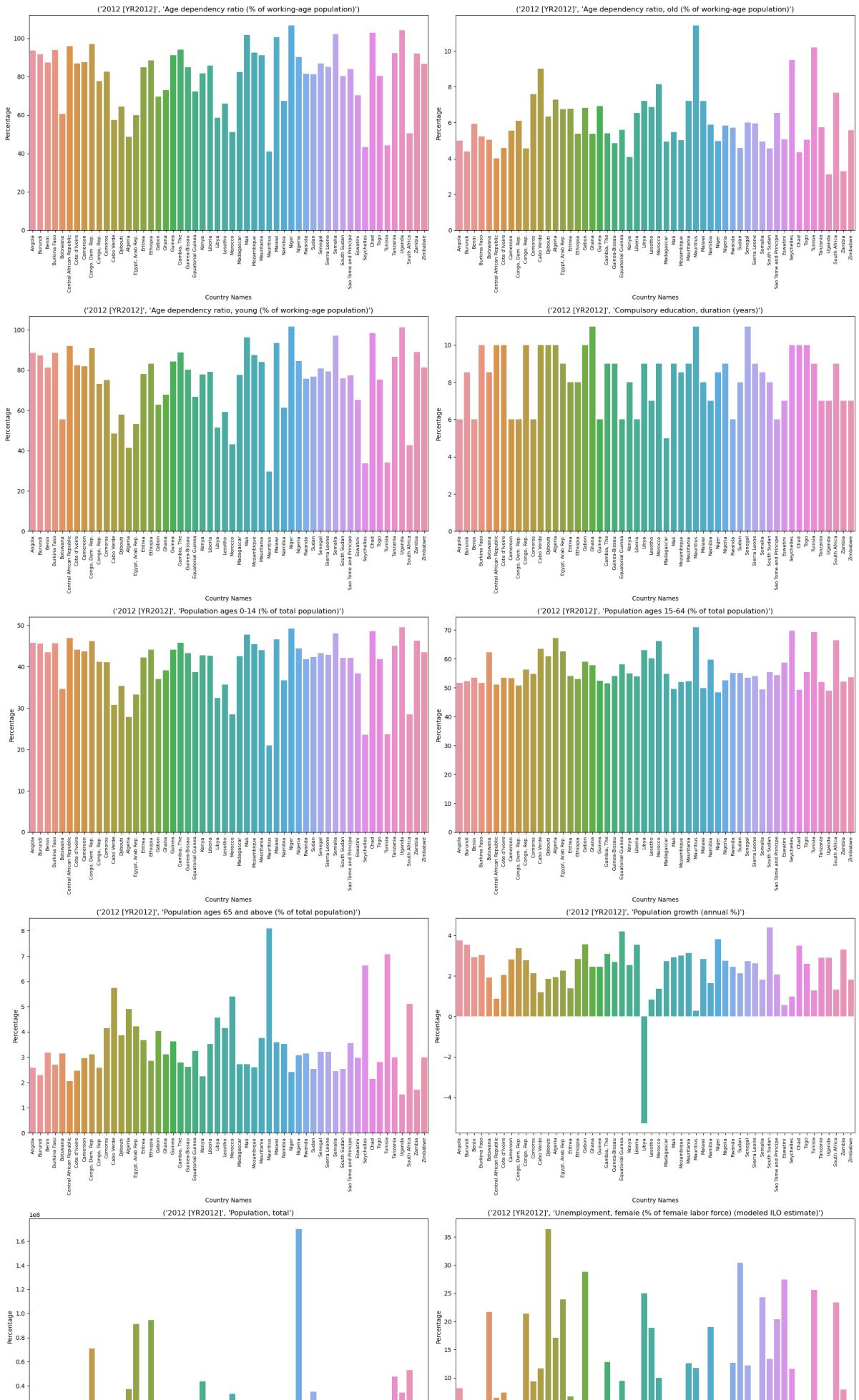


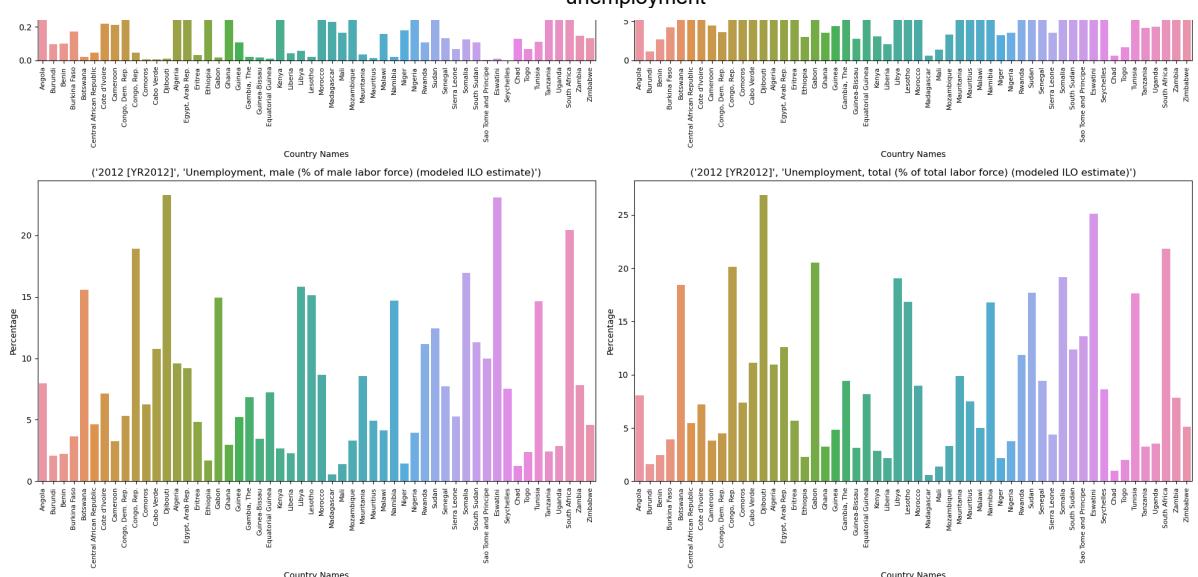


## 2012

```
In [36]: indicator = '2012 [YR2012]'  
plot_type = sns.barplot  
  
plot_bar(year, pivoted_df, indicator, plot_type)
```



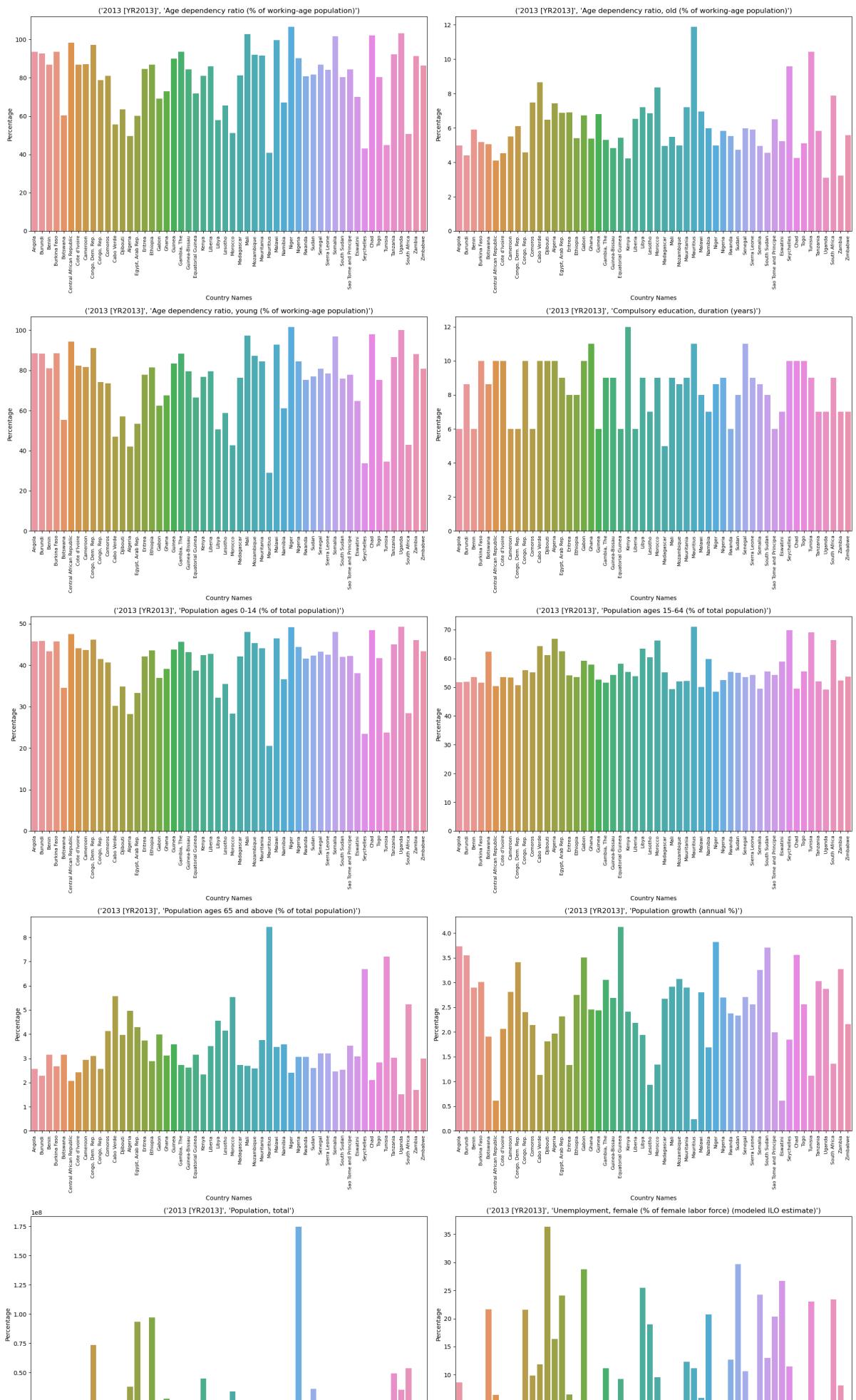


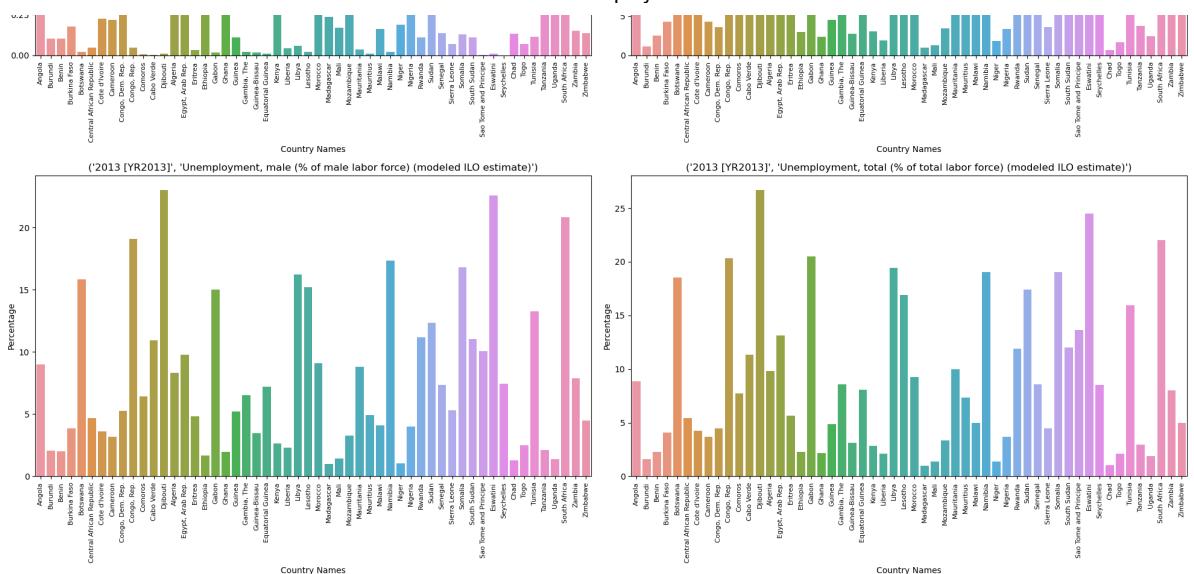


## 2013

```
In [38]: indicator = '2013 [YR2013]'  
plot_type = sns.barplot  
  
plot_bar(year, pivoted_df, indicator, plot_type)
```



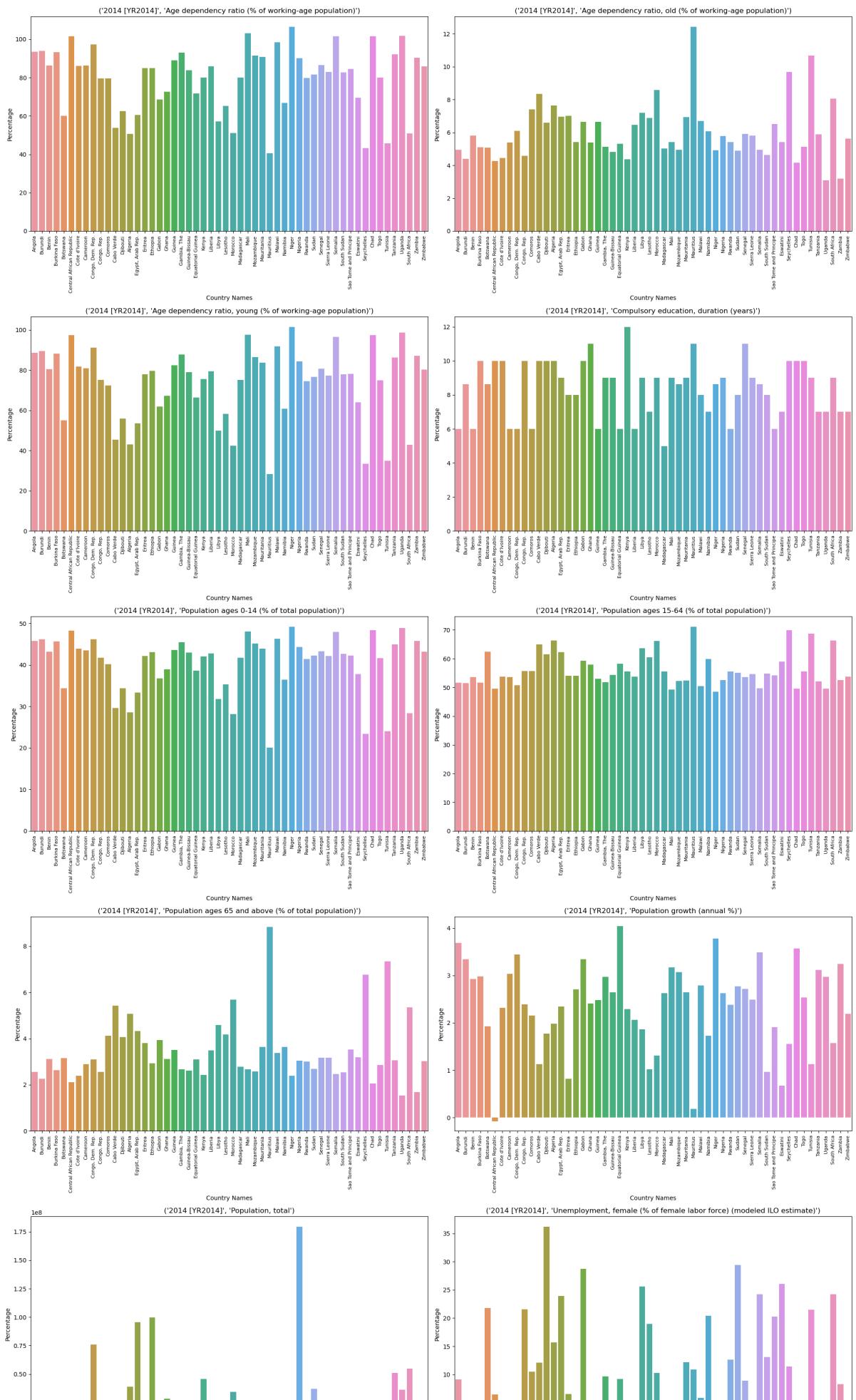


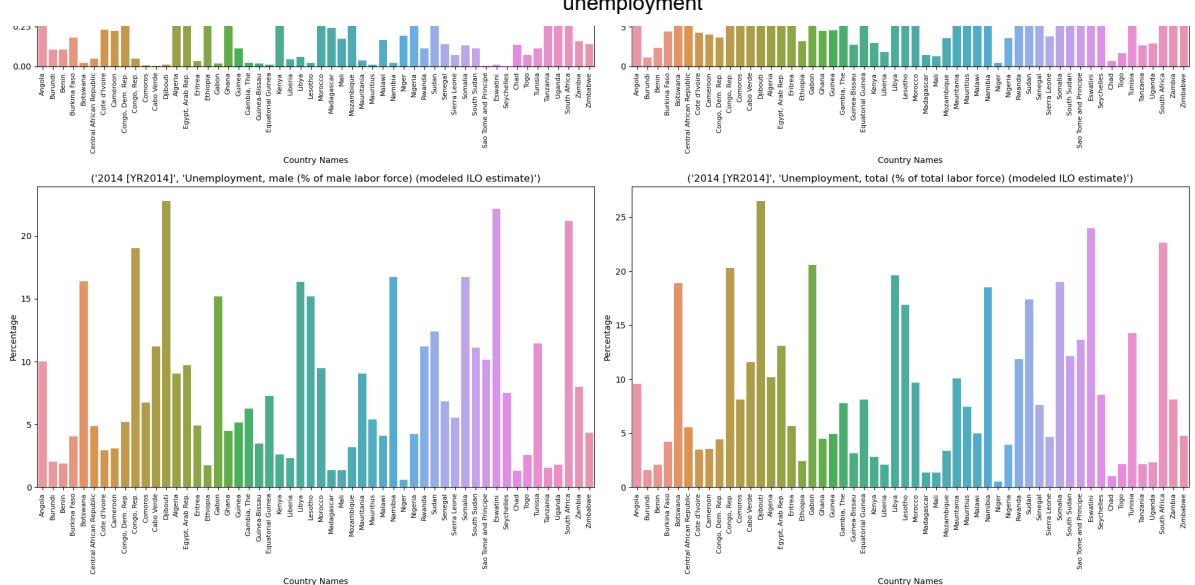


## 2014

```
In [39]: indicator = '2014 [YR2014]'  
plot_type = sns.barplot  
  
plot_bar(year, pivoted_df, indicator, plot_type)
```





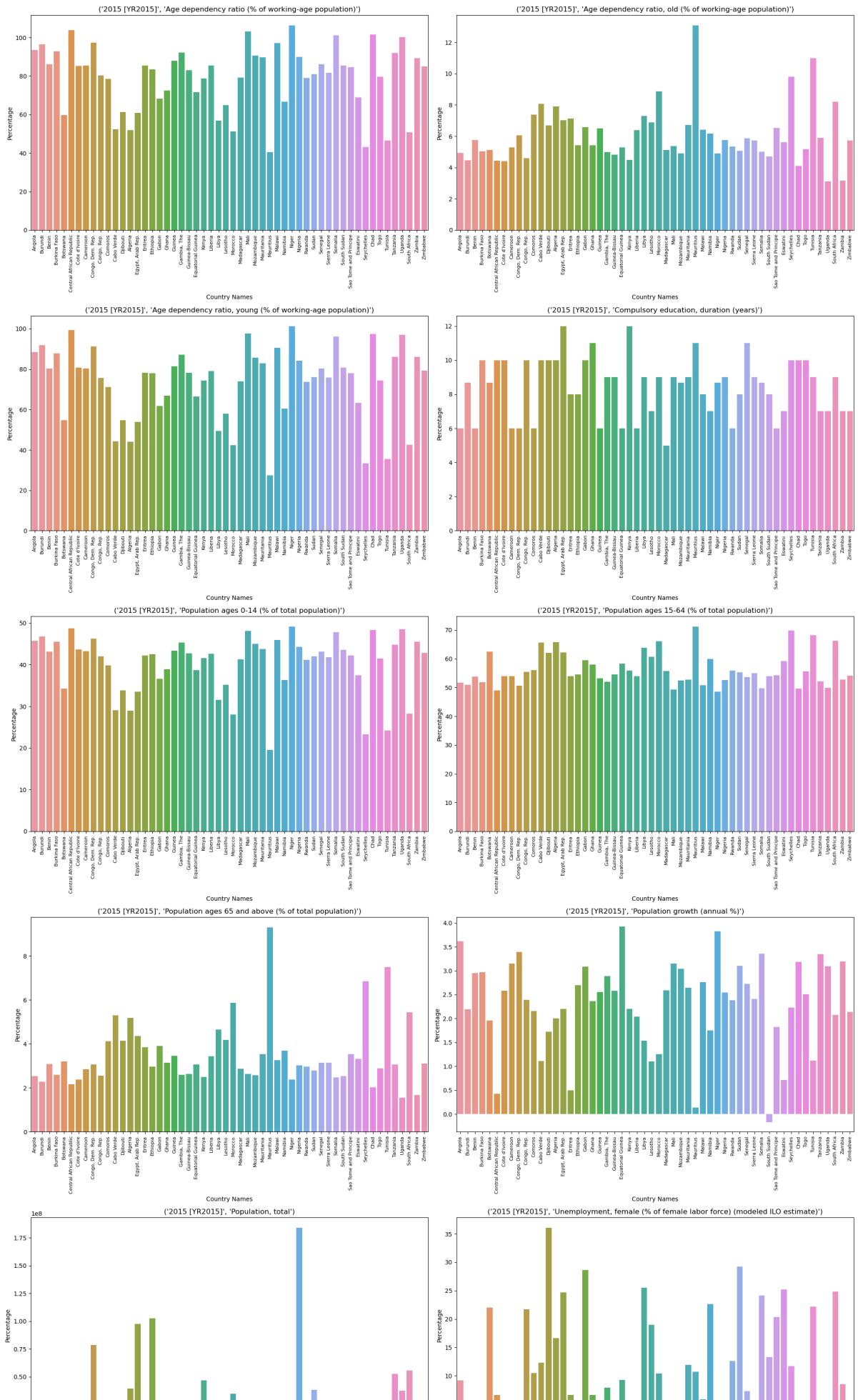


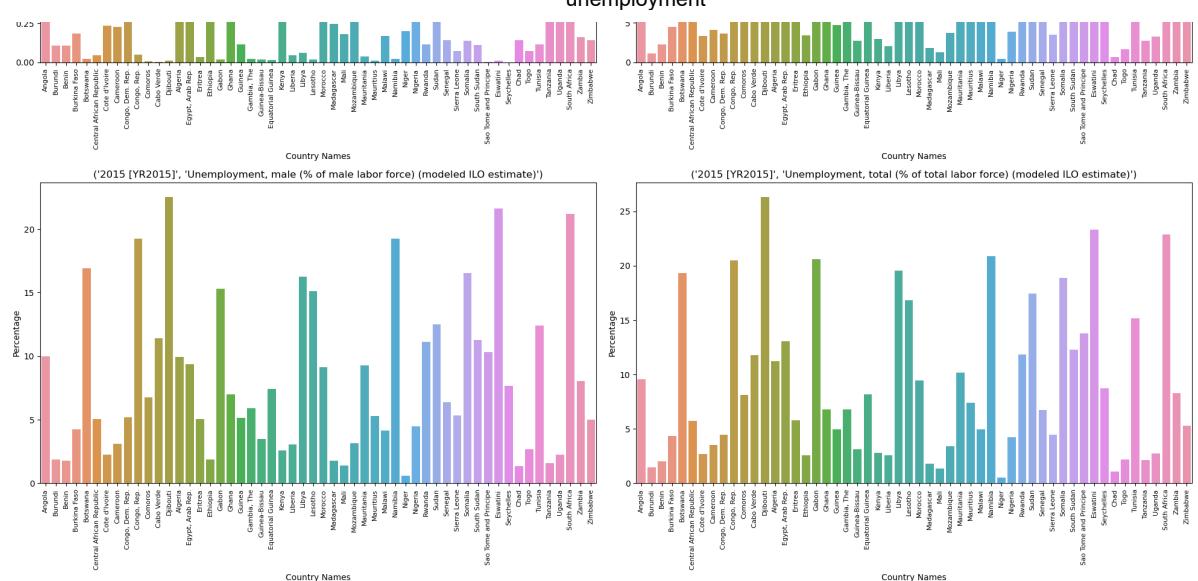
## 2015

```
In [34]: indicator = '2015 [YR2015]'  
plot_type = sns.barplot  
  
plot_bar(year, pivoted_df, indicator, plot_type)
```



unemployment

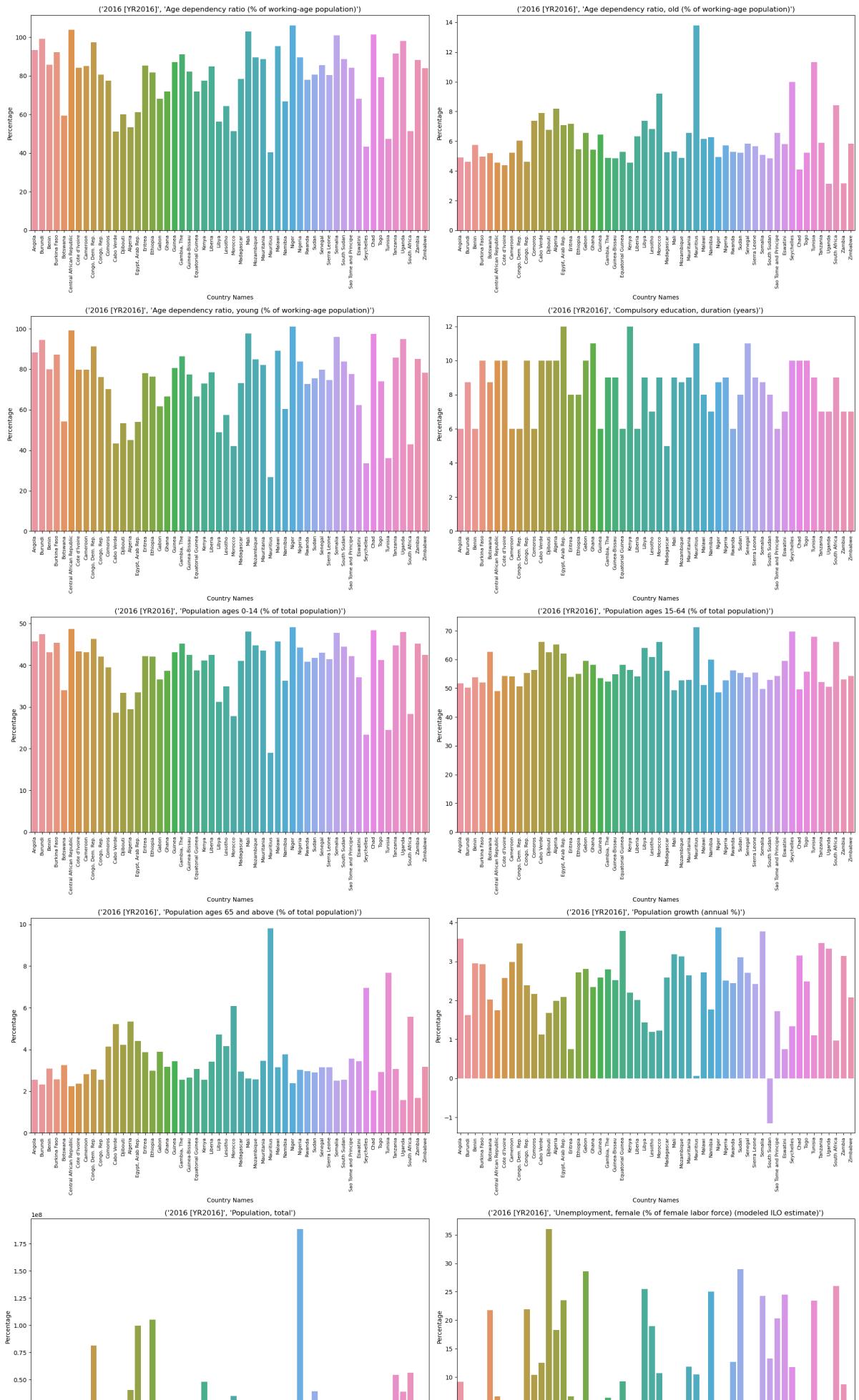


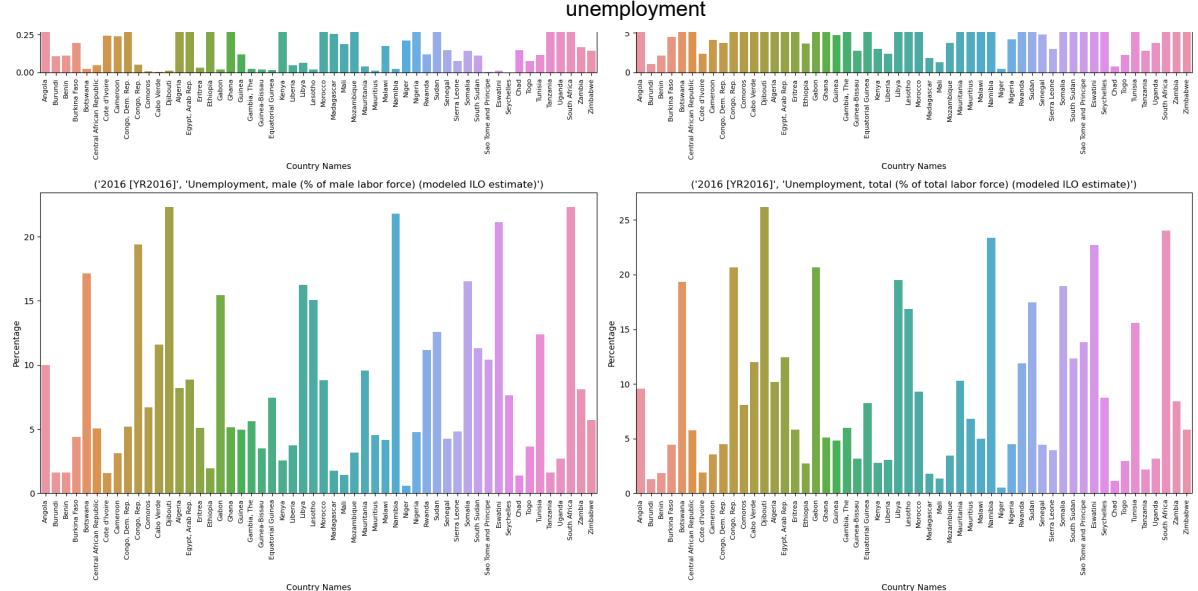


## 2016

```
In [40]: indicator = '2016 [YR2016]'  
plot_type = sns.barplot  
  
plot_bar(year, pivoted_df, indicator, plot_type)
```



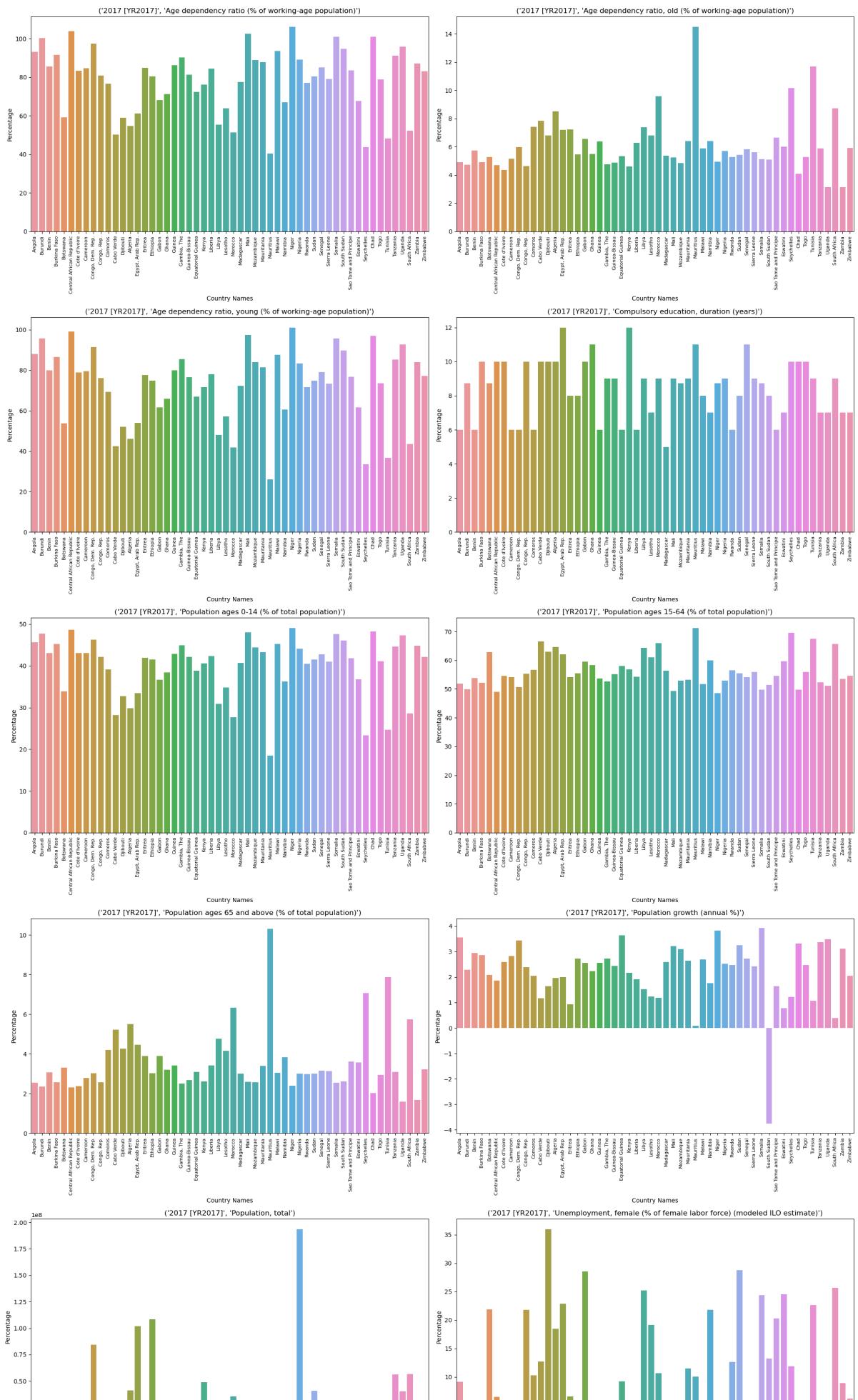


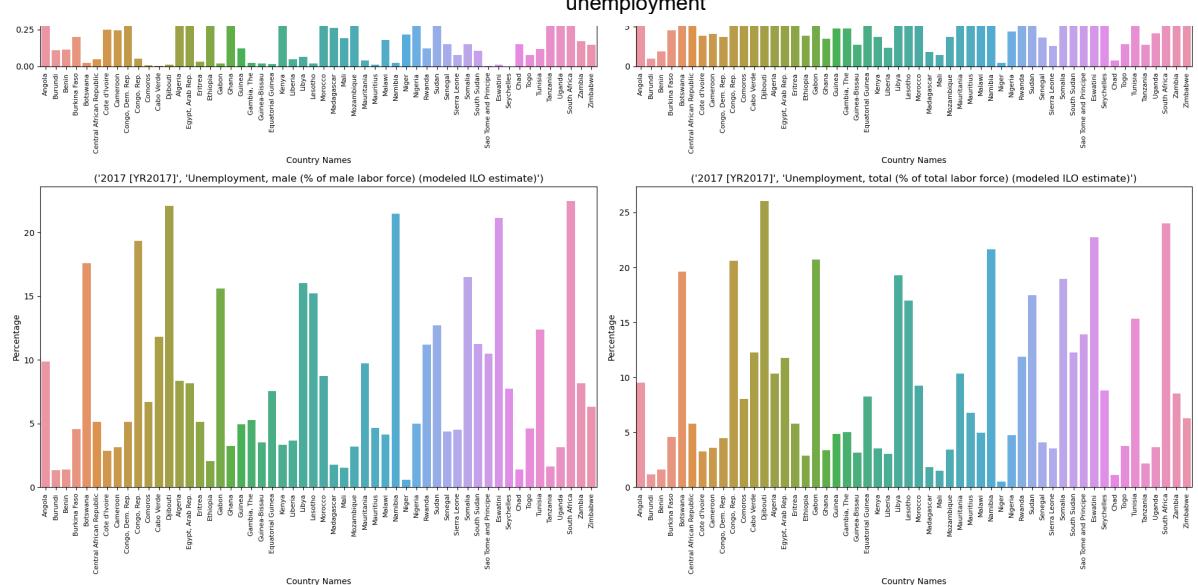


## 2017

```
In [41]: indicator = '2017 [YR2017]'  
plot_type = sns.barplot  
  
plot_bar(year, pivoted_df, indicator, plot_type)
```



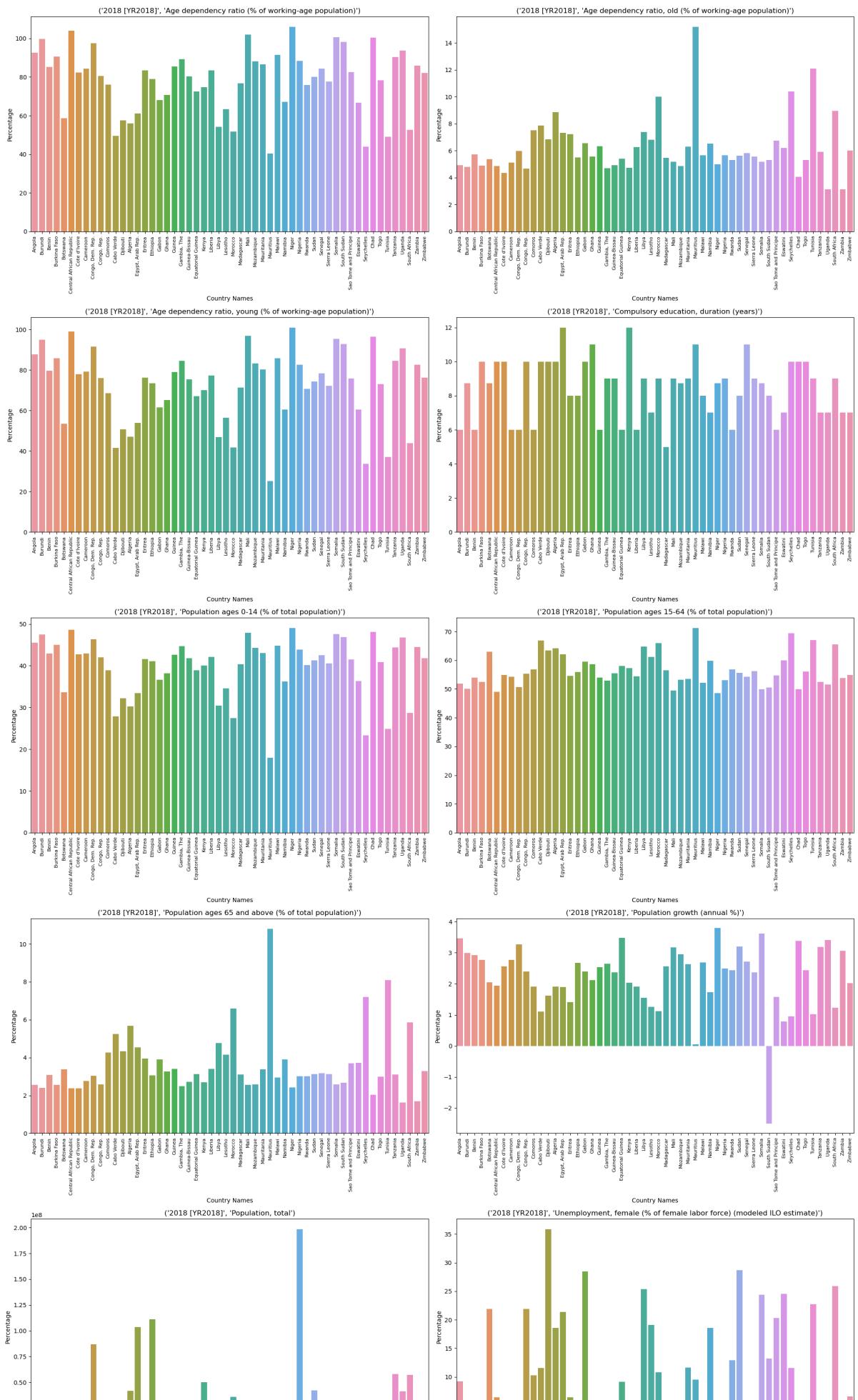


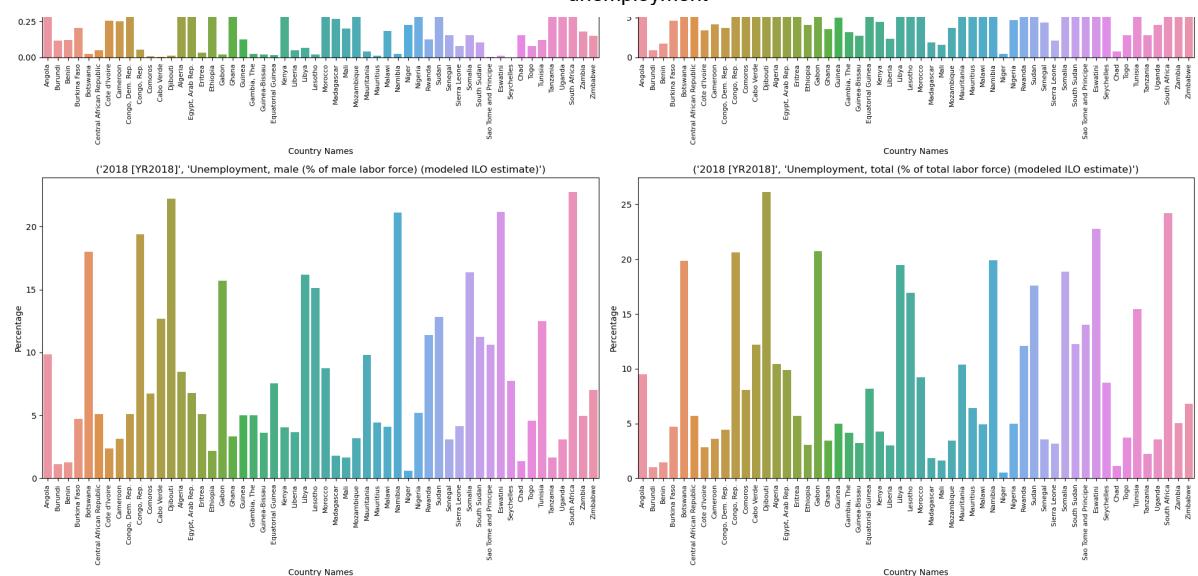


## 2018

```
In [42]: indicator = '2018 [YR2018]'  
plot_type = sns.barplot  
  
plot_bar(year, pivoted_df, indicator, plot_type)
```







## 2019

```
In [ ]: indicator = '2019 [YR2019]'
plot_type = sns.barplot

plot_bar(year, pivoted_df, indicator, plot_type)
```

## 2020

```
In [ ]: indicator = '2020 [YR2020]'
plot_type = sns.barplot

plot_bar(year, pivoted_df, indicator, plot_type)
```

## 2021

```
In [ ]: indicator = '2021 [YR2021]'
plot_type = sns.barplot

plot_bar(year, pivoted_df, indicator, plot_type)
```

## 2022

```
In [ ]: indicator = '2022 [YR2022]'
plot_type = sns.barplot

plot_bar(year, pivoted_df, indicator, plot_type)
```