05 assignment creating wdi quarto

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	country	inflation_rate	exports_gdp_share	gdp_growth_rate	gdp_per_capita	adult_lite
0	Afghanistan	NaN	18.380042	-6.240172	357.261153	NaN
1	Albania	6.725203	37.197085	4.826688	6846.426143	98.5
2	Algeria	9.265516	30.808979	3.600000	4961.552577	NaN
3	American Samoa	NaN	46.957520	1.735016	18017.458938	NaN
4	Andorra	NaN	NaN	9.564612	42414.059009	NaN

"TOP TEN VACCINATED COUNTRIES"

```
top_vaccinated_countries = data.nlargest(10, 'measles_immunisation_rate')[['country', 'measle
top_vaccinated_countries
```

	country	measles_immunisation_rate	unemployment_rate
6	Antigua and Barbuda	99.0	NaN
14	Bahrain	99.0	1.326
41	China	99.0	4.980
49	Cuba	99.0	1.820
66	Fiji	99.0	4.446
87	Hungary	99.0	3.609
91	Iran, Islamic Rep.	99.0	9.085
100	Kazakhstan	99.0	4.860
106	Kuwait	99.0	2.174
116	Luxembourg	99.0	4.588

"TEN LOWEST VACCINATED COUNTRIES COUNTRIES"

```
lowest_vaccinated_countries = data.nsmallest(10, 'measles_immunisation_rate')[['country', 'me
lowest_vaccinated_countries
```

	country	measles_immunisation_rate	unemployment_rate
132	Montenegro	33.0	14.851
5	Angola	37.0	14.602
37	Central African Republic	41.0	5.956
152	Papua New Guinea	41.0	2.689
118	Madagascar	44.0	3.186
176	Somalia	46.0	19.050
81	Guinea	47.0	5.267
60	Equatorial Guinea	49.0	8.455
54	Djibouti	50.0	26.307
20	Benin	52.0	1.685

Measles and Economic Factors

Measles immunisation rates and economic factors, such as unemployment and overall economic stability, are closely linked. Higher immunisation rates often correlate with stronger healthcare infrastructure, which is typically found in wealthier nations with stable economies. Countries with robust economic development can allocate more resources to public health initiatives, ensuring widespread vaccine access. Conversely, nations with low immunisation rates often face economic challenges, including higher poverty rates, weaker healthcare systems, and limited public funding for immunisation programs. Additionally, outbreaks of vaccine-preventable diseases like measles can strain healthcare systems, reduce workforce productivity, and hinder economic growth by increasing healthcare costs and reducing human capital development. Thus, improving immunisation coverage can have long-term economic benefits by fostering a healthier, more productive population.

When immunisation rates decline, the likelihood of outbreaks increases, leading to higher healthcare expenditures and economic disruptions. Governments must divert resources to outbreak management, which could otherwise be invested in economic development. Additionally, workforce productivity suffers as infected individuals miss work, parents stay home to care for sick children, and businesses experience operational disruptions. This burden is especially severe in low-income countries, where healthcare systems are already strained. This has been shown in small localized studies such as the measles outbreak in Clark County (2012), but has been deemed externally valid. (**pike2021societal?**)

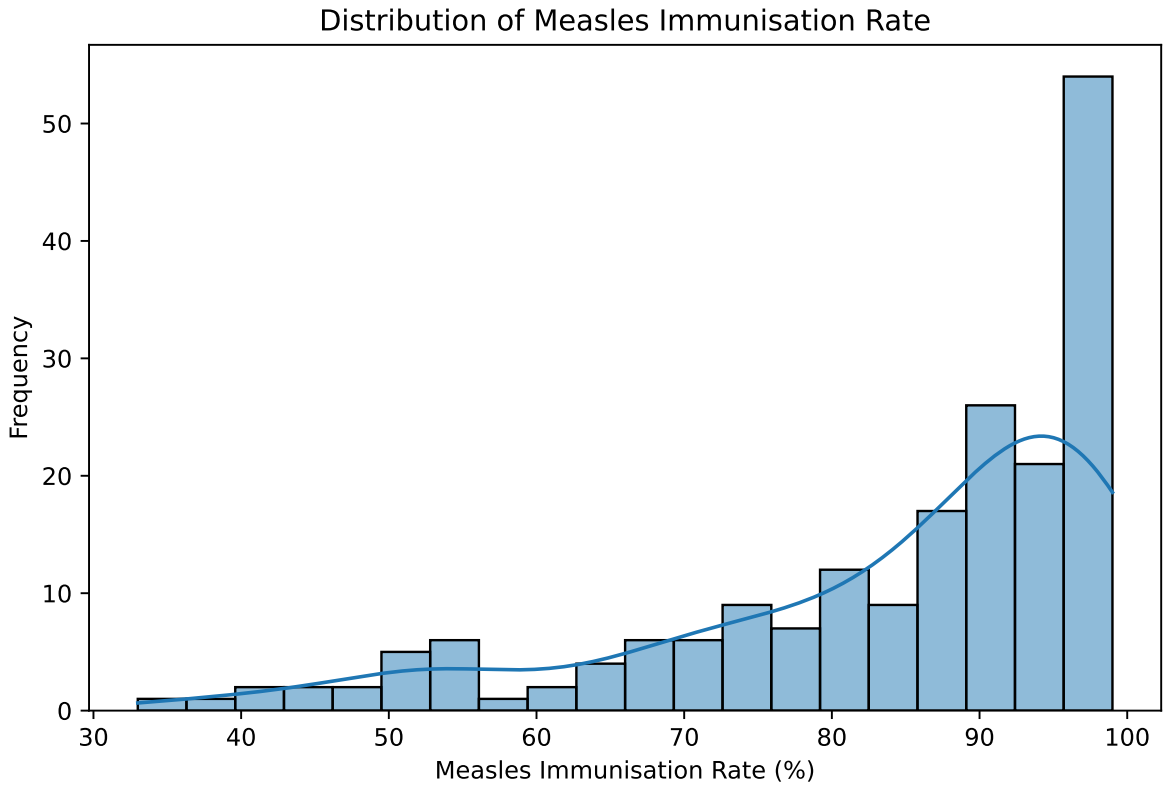

Figure 1: Measles Data

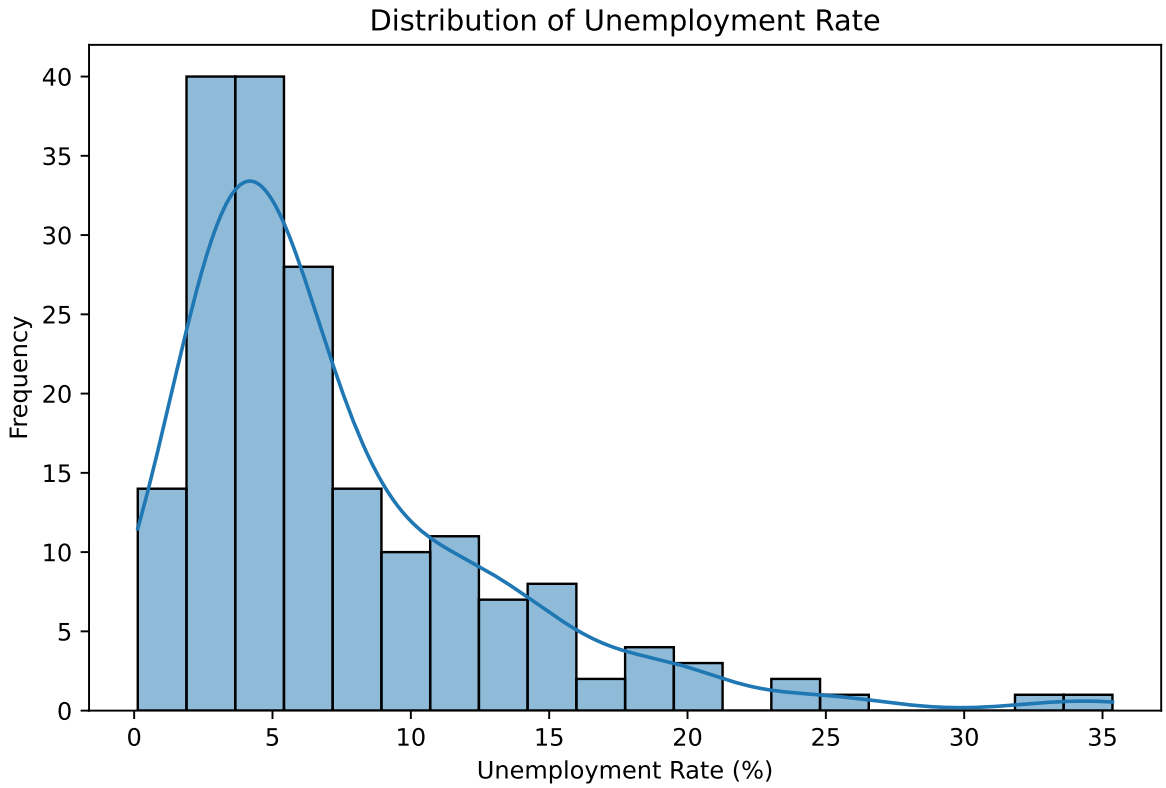

Figure 2: The Distribution of Unemployment Rates

Distribution of Unemployment rates

Generally speaking, the distribution of unemployment rates (as given by the wdi database) represent a right skewed bell curve. Many countries have unemployment rates remain grouped around the 3% - 15% rate. The countries with exceptionally high unemployment rates tend to be countries in the midst of an economic stumble or are a "developing" country.

According to the UN's International Labor Organization (ILO) has estimated that both the unemployment rate and the jobs gap have declined below pre-pandemic levels. In 2023, the global unemployment rate was 5.1%, a 0.2% improvement over 2022. The global jobs gap—the number of individuals who want employment, regardless of whether they are currently available or searching—narrowed in 2023 to 435 million, down from close to 500 million in 2020, 476 million in 2021 and over 440 million in 2022. However, progress was uneven. Even within affluent/developed countries, high inflation rates and rising housing costs significantly eroded much of the recent nominal wage gains. (**feldmann2007economic?**)

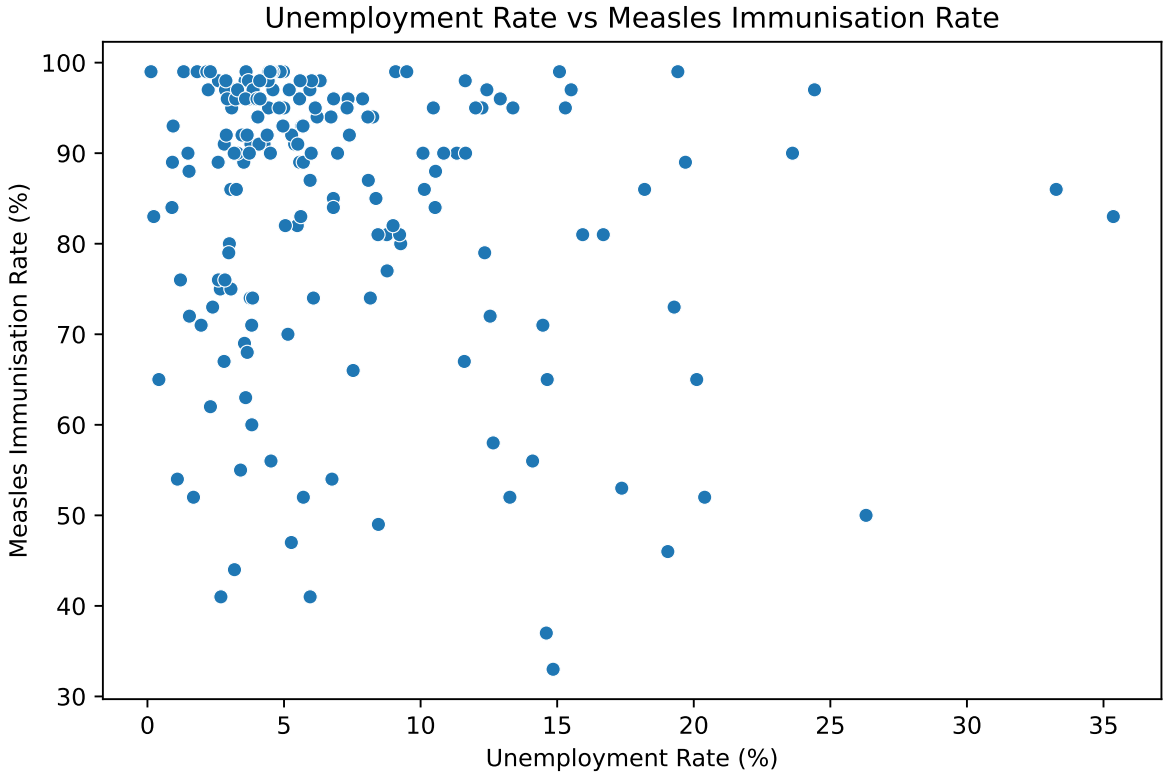

Figure 3: Relationship between unemployment rate and measles immunization rate

Basic Key Statistics on Measles Immunization Rates and Unemployment Rates

```
key_statistics = pd.DataFrame({
    "Category": ["Highest Measles Immunisation Rate", "Lowest Measles Immunisation Rate",
                 "Average Unemployment Rate (High Immunisation)", "Average Unemployment Rate
    "Value": [99.0, 33.0,
              top_vaccinated_countries['unemployment_rate'].mean(),
              lowest_vaccinated_countries['unemployment_rate'].mean()]
})

key_statistics
```

	Category	Value
0	Highest Measles Immunisation Rate	99.000000
1	Lowest Measles Immunisation Rate	33.000000
2	Average Unemployment Rate (High Immunisation)	4.098667
3	Average Unemployment Rate (Low Immunisation)	10.204800