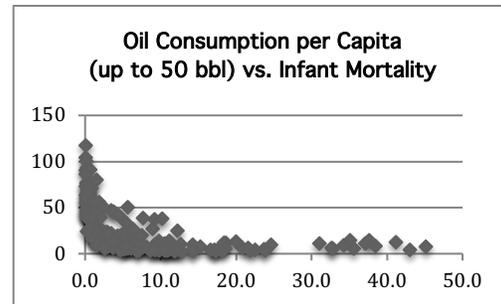
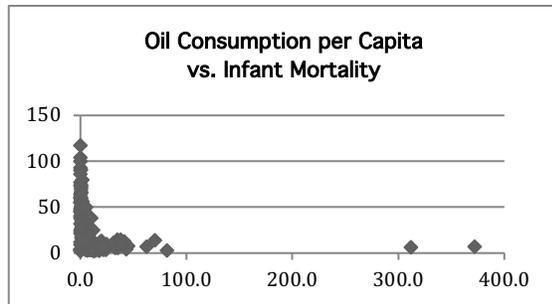


4.2) INSTRUCTOR’S GUIDE TO DEVELOPMENT AND QUALITY OF LIFE

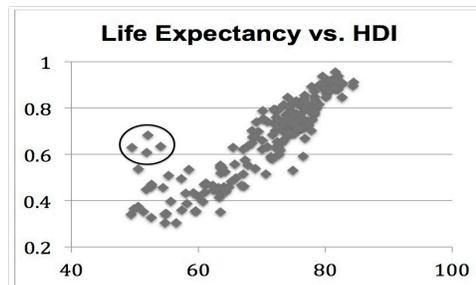
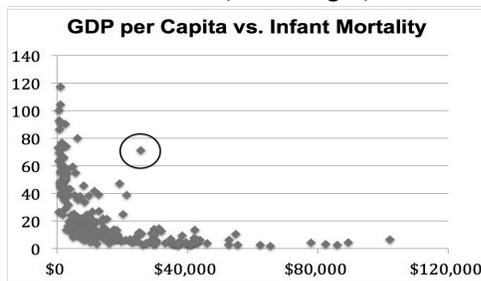
Overview: Even though two completed spreadsheet (minus graphs) are contained in the “Instructor’s Guide,” spreadsheet-making instructions are provided at this section for teachers or more advanced students who want to generate their spreadsheets from scratch.

Sadly, the CIA was “updated” so that can no longer download country comparisons for electricity and oil consumption. Consequently, the data in the updated spreadsheet (2015-2023) was downloaded from “Worldometer.” Direct link: <https://www.worldometers.info/>

Some extreme values will make it hard to discern the overall pattern. You can exclude these values by choosing an upper limit on the axis scale as in the example below that is set to 50 barrels per capita.



Examples of outlier points include the Virgin Islands, Gibraltar, Saint Pierre and Miquelon, and Singapore. These countries and territories show very high oil consumption relative to GDP because they serve as refueling ports for cargo ships. Equatorial Guinea has a high infant mortality relative to GDP due to extreme corruption (below left). Botswana, Gabon, Namibia, and South Africa have low life expectancy relative to HDI due to AIDS (below right).



An effective way to identify specific outliers is to use the “data sort” function to put all the data in the order of the parameter of interest then look for a corresponding parameter that does not follow the pattern. The data below is in order of infant mortality and the outlier (for oil consumption) is Singapore:

Location	Infant mortality	Barrels consumed per capita
Japan	2.13	12.8
Bermuda	2.48	14.4
Norway	2.48	18.1
Singapore	2.53	82.0

Logistics: you choose to have your students build spreadsheets from scratch you will need more class meetings. One possible strategy is to divide the work and give one or two students the responsibility of making sure the countries line up after the data is submitted by the rest of the group.

Degree of Difficulty: 2—Not all students might be proficient with spreadsheets, so you may want to teach a few key students how to make scatter plots. These students can in turn teach this to everyone else.

Supplemental Instructions: Generating the Spreadsheet from Scratch:

- 1) Open the “CIA World Factbook”: <https://www.cia.gov/the-world-factbook/>
- 2) Look to the upper right corner and open “References.”
- 3) Scroll down to “Country Comparisons” and open “Learn more.” Direct Link: <https://www.cia.gov/the-world-factbook/>
- 4) In the next window, open “Birth rate.” You will get a list of countries in order of number of births per 1000 population as seen below:

DOWNLOAD DATA

RANK	COUNTRY	(BIRTHS/1,000 POPULATION)	DATE OF INFORMATION
1	NIGER	46.12	2014 EST.
2	MALI	45.53	2014 EST.
3	UGANDA	44.17	2014 EST.

- 5) Click on the “download data” box on the upper right to download the chart.
- 6) Open a blank spreadsheet and highlight the first four columns of your downloaded spreadsheet as indicated on the top right:
- 7) Paste the highlighted data to these first four columns of your spreadsheet as indicated on the middle right:
- 8) Delete the two outside columns that you do not need (rank number and year) as indicated in on the bottom right:

	A	B	C	D	E
1					
2					
3					

	A	B	C	D	E
1	1	NIGER	46.12	2014 EST.	
2	2	MALI	45.53	2014 EST.	
3	3	UGANDA	44.17	2014 EST.	

	A	B	C	D	E
1	NIGER	46.12			
2	MALI	45.53			
3	UGANDA	44.17			

- 9) Arrange the data into alphabetical order. To do this, highlight these two columns and go to the “Data” option on excel. Under this option choose “Sort” and type in the letter corresponding to the column with the names of the countries. After doing this the first two rows should now look like this:

◇	A	B
1	Afghanistan	38.84
2	Albania	12.73

- 10) Go back to the website under “People and Society,” scroll to “Infant mortality per 1000 live births”, then click on “country comparison to the world.” Download the data and copy them to the next two columns on your spreadsheet:

◇	A	B	C	D	E
1	Afghanistan	38.84	1	Afghanistan	117.23
2	Albania	12.73	2	Mali	104.34

- 11) Delete the number ranking column and use the “Sort” function as you did previously to put it in alphabetical order:

◇	A	B	C	D
1	Afghanistan	38.84	Afghanistan	117.23
2	Albania	12.73	Albania	13.19

As you look down the column you will notice that many of the countries do not line up. In the example below the Faroe Islands did not provide birth rate data:

◇	A	B	C	D
67	Fiji	19.86	Faroe Islands	5.71
68	Finland	10.35	Fiji	10.2

This problem is addressed by deleting this country and its data so they line up:

◇	A	B	C	D
67	Fiji	19.86	Fiji	10.2
68	Finland	10.35	Finland	3.36

- 12) Go down the entire column to make sure that all of countries line up, taking great care to examine each pair to make sure that no countries or their data are mismatched. Never assume that just because countries at the bottom of your list (such as Zimbabwe) line up that every country above it is also paired correctly. Check the entire list!
- 13) Highlight the values corresponding to “birth rate” and “infant mortality”, then make a scatter plot the data. If all the data have been entered into the correct cells your data points should indicate a fairly straight line with few outliers. Give your graph a title and a caption describing the trend and the reason for this relationship between x and y.
- 14) Return to “**People and Society**” and follow the same procedure for gathering data for the following two data set one by one: “**Population**” and “**Life expectancy at birth.**”
- 15) For GDP per capita, electricity consumption, oil consumption, and oil production: Follow the same procedure for collecting and lining up all the data.
- 16) After you have gathered all the data and made sure all of the countries line up, label the columns (using abbreviations to save space) and re-order them so that population is in column B. Your spreadsheet should now look like this:

A	B	C	D	E	F	G	H	I	J
Country	Pop’n	Infant mort.	Life exp.	Birth rate	GDP/capita	Electr. use	Oil use	Oil-prod.	Teleph. lines
Albania	3.6E+06	19	78	12	6200	3.6E+09	3.4E+04	5.9E+03	3.2E+05

Inserting Spreadsheet Functions:

- 1) **Column K** corresponds to electricity consumption in kilowatt-hours per capita per day. This is obtained by dividing the amount of kilowatt-hours per year by the total population and further dividing by 365. Label the column and enter this formula into K2:

$$= (G2/B2)/365$$

- 2) **Column L** corresponds to oil consumption in barrels per capita per year. Label the column and enter this formula into L2:

$$(365*H2)/B2$$

- 3) **Column M** corresponds to oil production per capita per year. Label the column and enter this formula into M2:

$$= (365*I2)/B2$$

- 4) **Column N** corresponds to telephone lines per capita. Label the column and enter this formula into N2:

$$= J2/B2$$

Data Collection from the Heritage Foundation:

- 1) Go to the “**Index of Economic Freedom**” for the Heritage Foundation:
<http://www.heritage.org/index/>
- 2) Click on “**Download**” at the top of the website, then click on “**Download Raw Data**”.
- 3) Since data is already in the spreadsheet all you need to do is copy and paste the columns that correspond to the name of the country and the score and organize them the same as you organized the previous data from the CIA Factbook.

Data Collection from the Transparency International:

- 1) Open the website for Transparency International: <https://www.transparency.org/>
- 2) Scroll down to the bottom and open the link for “**Corruption Perceptions Index.**” Direct link:
<https://www.transparency.org/en/cpi/2022>
- 3) Scroll down to the heading “**CPI 2022 Global Results & Trends**” and click on it to download the CPI chart.

Data Collection from the Human Development Reports:

- 1) Go to the United Nations Human Development Index Report: <http://hdr.undp.org/en/statistics/hdi>
- 2) Click on “**Table 1: Human Development Index and its Components**”, then click on the tab for exporting the data and choose “**XLS**”.
- 3) Copy and paste the columns that correspond to the name of the country, the HDI and gender inequality scores, then organize them the same as you organized the previous data from the CIA factbook.