Spreadsheet Assignment
due February 16, 2024

The spreadsheet involves choosing a developing country, a development indicator, and a time period. You collect quantitative data on the indicator in the country during the time period, create tables and a graph with the data, and pose research questions based on your observations.

The spreadsheet allows you to observe, descriptively, what is distinctive -- unusually good, unusually poor, or (less engagingly) close to average -- about your country's performance on an indicator over a time period. This distinctiveness could be in terms of level achieved, overall progress made, or tempo of progress within the time period. For level and overall progress analyses you will need to compare your country's performance to a reference set of countries, such as your country's world region (for example, South Asia) or income category (for example, middle-income countries). Posted on the course Moodle segment for February 16 are example spreadsheets for GDP per capita (Botswana 1990-2021), infant mortality (Peru 1990-2021), and the male-to-female ratio in the 0-4 age group (China 1950-2021).

The spreadsheet assignment has 10 steps.

1. Choose a developing country, time period, and indicator.

Choose a developing country, a time period about 20-60 years long, and one of these indicators:

• *GDP per capita, PPP (constant 2017 international dollars)*
      Source: World Bank via Our World In Data
      Country and region data available for 1990-2021

• *Mortality rate, infant (per 1,000 live births)*
      Source: Inter-agency Group for Child Mortality Estimation via Our World in Data
      Data for some countries start even before 1960, but region data only for 1990-2021

• *Sex ratio (male-to-female ratio) in the 0-4 age group*
      Source: United Nations Population Division, World Population Prospects, 2022
      Country and region data available for 1950-2021
      Scroll down to Sex Ratio by Select Age Groups (.xlsx, 159.96mb)
      Download takes 1 min 20 sec, but you use only a few columns of first tab

If you're not sure whether a certain country counts as a developing country, consult the instructor. Before starting the spreadsheet assignment, make sure that your country has enough data on your indicator during your time period to complete the assignment. Also, confirm that a substantial secondary literature exists on policies and circumstances that help to explain your country's performance on your indicator during your time period. If data are insufficient, or if the secondary literature is sparse, choose a different country, indicator, and/or time period. Note that Step 9 of this spreadsheet assignment requires you to provide full citations to at least three academic publications that provide information on the policies and circumstances that help to explain your country's performance on your indicator during your time period.

Optimally, your time period will coincide with a substantively coherent interval, such as:

• a particular political regime (e.g., Peru since the end of authoritarian rule, 1990-present)
• the aftermath of a major policy reorientation (e.g., India's market reforms, 1991-present)

Data on GDP per capita, PPP (constant 2017 international dollars) are available from the World Bank only since 1990. Accordingly, if you are working on the *level* attained at the end of a time period, or on *overall progress* over the course of a time period, you won't be able to evaluate your country's pre-1990 *performance* on GDP per capita in comparison to a reference group. Looking ahead to your research paper, however, your mission will be to identify policies and circumstances that *help to explain* your country's GDP per capita performance, and you will almost certainly want to call attention to factors that operated prior to 1990.

Infant mortality figures are available for most countries since 1960 or even earlier, but for comparison groups like "Latin America & Caribbean" or "middle-income countries," they are available only since 1990. Accordingly, if you are working on the *level* that infant mortality attained at the end of a time period, or on *overall progress* on infant mortality over the course of a time period, you won't be able to evaluate your country's pre-1990 *performance* on infant mortality in comparison to a reference group. Looking ahead to your research paper, however, your mission will be to identify policies and circumstances that *help to explain* your country's infant mortality performance, and you will almost certainly want to call attention to factors that operated prior to 1990. Moreover, infant mortality data on *individual* developing countries (as opposed to aggregates like "Latin America & Caribbean" or "middle-income countries") are often available from 1960 or even earlier. So, if you wish to analyze the *tempo of progress within a time period*, the absence of data on regional or income-group aggregates doesn't matter and you should feel free to analyze time periods starting before 1990.

You will be asked on the spreadsheet to justify your choice of start year and end year. It is fine, often necessary, to justify your choice of such years as simply reflecting data availability.

For instructions on how to obtain data on each of the three indicators, see the three example spreadsheets on the February 16 segment of the course Moodle.

The <u>first example spreadsheet is for GDP per capita</u>. It uses the example of Botswana compared to sub-Saharan Africa over the period from 1990 to 2021. The indicator used is GDP per capita, PPP (constant 2017 international dollars). PPP means purchasing power parity (PPP), which means that the GDP per capita figure is adjusted for the fact that most goods and services cost less in poor countries than in rich countries. Constant means that the figures are inflation-adjusted, with the value for each year expressed in 2017 US dollars.

The <u>second example spreadsheet is for infant mortality</u>. It uses the example of Peru compared to Latin America and the Caribbean over the period from 1990 to 2021. The infant mortality data are from Our World in Data, which takes them from the UN Inter-agency Group for Child Mortality Estimation. The infant mortality rate is usually expressed in infant deaths per 1000 live births (per mil), but Our World in Data expresses it as as deaths per 100 live births (percent). If

you want to convert each of the annual figures to the more usual infant deaths per 1000 live births, just multiply it by 10.

The third example spreadsheet is for the male-to-female ratio in the 0-4 age group. It uses the example of China compared to less developed regions, excluding over the period from 1950 to 2020. Data on the male-to-female ratio in the 0-4 age group come from the United Nations Population Division's (UNPD's) *World Population Prospects 2022*, spreadsheet on "Sex Ratio By Select Age Groups," column for the 0-4 age group. For better or worse, the "sex ratio" is conventionally the male-to-female ratio.

Looking ahead, in your research paper due May 14, 2024, you will be asked to explain *one* of the following outcomes (your choice):

(a) **Level**: how well your country did at achieving a particular *level* of your indicator at the end of your time period (this is often complicated because it depends in part on long-term factors); *or*

(b) **Progress**: how well your country did at *improving* your indicator between the beginning and end of your time period (this is often an interesting, policy-responsive outcome); *or*

(c) **Tempo**: why in your country your indicator made a sharp and sustained *upturn* or *downturn* over certain years within your time period (this is often an interesting and even more policy-responsive outcome).

2. Create a values table. Create a table comparing the values for your country on your indicator during your time period to the values for your country's region or for some other appropriate reference group of countries (middle-income countries, all countries in the world, etc.).

Without a reference group of comparison countries, you could still try to explain why your country did better during some time periods than during others, but you wouldn't be able to tell whether your country had done "well" or "poorly" at the other two outcomes -- the level achieved at the end of a time period or the improvement of the level during that time period.

Instructions for creating a values table

Note: the following instructions are (more or less) reproduced, tailored to the specific indicator referenced, at the bottom of the example spreadsheets for GDP per capita (Botswana 1990-2021), infant mortality (Peru 1990-2021), and the male-to-female ratio in the 0-4 age group (China 1950-2021)

2.1. Down the side of your table should be rows for years -- one row for each year in your time period.

2.2. Across the top should be three columns: one for year, one your country's values each year on your indicator, and one for the analogous values for the region in which your country is located or for some other plausible reference group of countries (for example, in the case of China, "Less developed regions, excluding China").

2.3. In the leftmost column of your table, put "Year" the top cell and fill in the years below, in consecutive cells down the column, one year per cell (in Excel, the "Fill > Series > Step Value 1" command under the "Edit" menu is a handy tool for doing this).

2.4. In the middle column of your table, put the name of your country in the top cell next to "Year" and fill in the cells below your country name with the corresponding year's annual value of GDP per capita, infant mortality, or male-to-female ratio in the 0-4 age group. If data turn out to be sparse or unavailable for your country or for your region, or if your country turns out to have a normal (102-105:100) sex ratio, choose a different country, indicator, and/or time period, until you have a focus country and a focus region that each have adequate data. If you choose this indicator, your focus country should at some point have had an anomalousy high sex ratio.

2.5. In the rightmost column of your table, repeat step 2.4 for your comparison group. At the top of the middlemost column, next to the country name, should be the name of your comparison group, for example, "sub-Saharan Africa" or "middle-income countries." If the name doesn't fit in the cell, use "wrap text" and widen the row and/or column until you can see all of the words.

3. Create an annual change table. A couple of lines below your values table, insert another table that registers annual *changes* rather than annual *levels* of the indicator you have chosen.

The table should have the same number of rows and columns as the values table you created in step 2 above, but the leftmost "Years" column should now be headed "End year" and the first row of cells below "End year" should be left blank (in the first year of your database you don't have data for the preceding year, so you can't calculate change from the preceding year to that particular "End year"). Down the side should (again) be cells for years in the leftmost column, but the next two columns to the right, instead of holding values representing *levels* of your indicator, should hold values representing the annual (year-to-year) *changes* in your indicator for your focus country (middle column), as well as for your comparison region (rightmost column).

For *GDP per capita* and *infant mortality*, calculate the annual percent changes by dividing the value in a certain year by the value in the previous year, subtracting 1, and expressing the quotient as a percentage taken out to one decimal place. For these indicators, to get an idea of the *tempo* of change of your indicator in your country within your time period, you may also want to calculate five-year or ten-year changes, both for your country and for your reference group of countries. See the Botswana and Peru spreadsheets of examples of how to do this.

For the *male-to-female ratio in the 0-4 age group*, calculate the annual percent changes by simple addition or subtraction (e.g., 1.06 to 1.07 = +0.01; 1.09 to 1.06 = -0.03). To get an idea of the tempo of change in the male-to-female ratio, just eyeball the numbers.

If you look at one of the example spreadsheets on the February 16 segment of the Moodle, all this will look a lot simpler! Also, you're welcome simply to transfer or adapt the formulas from the relevant example spreadsheet when formulating your own spreadsheet.

4. Calculate overall change. Instructions here differ depending on whether you chose as your indicator GDP per capita, infant mortality, or the male-to-female ratio in the 0-4 age group (see the example spreadsheets). For GDP per capita and infant mortality, take the mean of the annual changes. For the male-to-female ratio in the 0-4 age group, subtract the ratio in the start year from the ratio in the end year.

5. Create a chart. Next to the top table for level, insert an associated time-series chart (graph) depicting the over-time evolution of the *level* of your indicator in your focus country compared to a reference region. Place the level chart to the right of the level table. For guidance, see the example spreadsheets on the course Moodle.

6. Justify your time period. Explain why you chose the start year and end year that you did. Data availability is a valid justification for either or both of these years. For guidance, see the example spreadsheets on the course Moodle.

7. Draw three descriptive conclusions. Based on your tables and graphs, how well did your country do on the indicator that interests you over the time period you selected? Comment on:

(1) the *level* your country attained on your indicator at the end of your time period, compared to the (usually regional or income group) comparison group of countries.

(2) *overall change* in your country on your indicator over your time period, compared to the (usually regional or income group) comparison group of countries.

(3) the *tempo* of change on your indicator in your country within your time period. Tempo analyses can be enriched by, but don't strictly require, a comparison group of countries.

The example spreadsheets on the February 16 segment of the course Moodle can be used as models for your descriptive conclusions.

8. Pose three analytical questions. Based on your three descriptive conclusions, pose three analytical questions relating respectively to:

(1) *why* your country at the end of your period attained the level it did on the indicator you chose
(2) *why* your country changed the amount it did from the beginning to the end of your period
(3) *why* your country during your period exhibited the tempo of change it did within your period

Your May 14 research paper assignment is to choose one of these questions and answer it.

9. List three or more high-quality references: academic books, book chapters, and/or articles you have already read or skimmed that will help you answer the analytical question you have chosen. Google Scholar is the best way to search. The citations at the end of each of the three example spreadsheets posted on the February 16 segment of the course Moodle are examples of correct bibliography format, but any standard format -- APA, Modern Language Association, Turabian -- is fine (for these and other formats go to http://libguides.wesleyan.edu/citing).

10. <u>Looking Ahead to the Research Paper</u>

Having picked a focus country, an indicator, a time period, and a comparison country or region, write a 10-12 page paper (due May 14) answering ONE of the following three questions:

Q1) What policies and circumstances help explain why, in your country, your indicator achieved the level that it did at the end of your time period? Or...

Q2) What policies and circumstances help explain why, in your country, your indicator registered the total amount of change that it did between the first and last years of your time period? Or...

Q3) What policies and circumstances help explain the tempo of change between the first and last year of your time period? In other words: why, in your country during your time period, did your indicator change more in some years than in others?

In your research paper, state briefly

• which of the three questions your research paper will attempt to answer

• how the indicator you chose is related to the overall goal of expanding human capabilities

• why your focus country and time period should interest the reader. Does your chosen time period in your chosen country correspond to a particularly interesting change in government, regime, or policy? Does it correspond to a remarkable (or paradoxical) success (or failure) at improving or undermining your chosen development indicator?

Drawing on books, journal articles, edited volumes, and other academic sources, outline specific government policies and historical, political, social-structural, international, or leadership circumstances that help to explain either:

• the **level** your country achieved on your indicator in the last year of your time period, or...

• the **overall progress** your country made on your indicator between the first and last years of your time period, or...

• the **tempo of progress** in your country between the first and last years of your time period.

Your paper should cite at least six academic sources. (Your spreadsheet should cite three, which you may also use in your research paper.) Using a standard bibliography format, list these works cited at the end of your research paper.