Homework #2 Help

Healthcare Spending Problem

Background Information

One of the most challenging problems in public health today is cost. In developed countries like the United States and those in Europe, the cost of providing healthcare is rapidly increasing and crowding out other spending.

Developing nations, like many of those in Sub-Saharan Africa, face a related problem. Their economies are much smaller, and as such, they cannot afford the same quality of care for their citizens as wealthier nations. This often leads to worse health outcomes for their citizens, all because they cannot receive the same treatments that would be possible if more money was available.

Problem Statement

In this assignment, students will analyze the cost of healthcare relative to GDP (Gross Domestic Product, the size of its economy) for regions all over the world to understand the relationship between healthcare and the economy.

Instructions

WARNING: This is not the actual Homework for your section. You will not receive any credit for completing this project.

IMPORTANT: Complete the steps below in the order they are given. Completing the steps out of order may complicate the assignment or result in an incorrect result.

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1. Download and extract the provided Data Files ZIP file. It contains the following file for use in this assignment:
   a. **healthspending.csv** – Data on the GDP and health-related spending for various regions of the world from 2003 to 2023 [1]–[5].

Column Name	Type	Description
Region	Text	Region of the world.
Year	Number	Year of the data.
GDP per Capita	Currency	Gross Domestic Product, a measure of the size of the economy, per capita, represented in U.S. dollars.
Government Health Spending per Capita	Currency	Spending per capita by each nation's own government, represented in U.S. dollars.
Private Health Spending per Capita	Currency	Spending per capita by private sources in each nation, represented in U.S. dollars.
Foreign Health Spending per Capita	Currency	Spending per capita from foreign sources, represented in U.S. dollars.
Total Health Spending per Capita	Currency	Total spending from all sources per capita, represented in U.S. dollars.

2. Create a new Microsoft Excel workbook named **hwhelp2_hsp_*lastname_firstname*.xlsx**.
3. We must adjust the sheets in our workbook.
   a. Rename *Sheet1* to *Health Spending*.
   b. Add a new sheet named *Scenarios*.
   c. Add a new sheet named *Analysis Questions*.
4. Import the following item into the workbook:
   a. **healthspending.csv** file – Import starting in cell **A3** of the *Health Spending* sheet. The file is comma-delimited. Its first row contains headers.
5. We wish to apply formatting to the *Health Spending* sheet.
   a. Format cells **A3** through **G150** as a table using a style of your choice other than the default style.
   b. We need to add additional table columns to store statistics.
      i. Insert four new table columns to the right of existing column **G**.
   c. For the table, turn on the ***First Column*** option.
   d. Enter text in the cells as indicated below:
      i. **A1**: `Healthcare Spending`
      ii. **H3**: `Min Spending`

iii. **I3**: `Max Spending`

iv. **J3**: `GDP Percentage`

v. **K3**: `Government vs Private`

e. Merge (but not center) cells **A1** through **K1**.

f. Apply the *Heading 1* cell style to cell **A1**.

6. On the *Health Spending* sheet, we wish to calculate healthcare spending statistics.

   a. In column **H**, write a formula to calculate the minimum amount of spending from any source for the region and year.

   b. In column **I**, write a formula to calculate the maximum amount of spending from any source for the region and year.

   c. In column **J**, write a formula to calculate, for the region and year, the percentage of GDP spent on healthcare.

      You can calculate the percentage using the formula:

      $$\frac{[Total\ Health\ Spending\ per\ Capita]}{[GDP\ per\ Capita]}$$

   d. In column **K**, write a formula to determine if spending came more from government or private sources. If more was spent by government sources, display `More Government Spending`; otherwise, display `More Private Spending`.

7. We must apply additional formatting to the *Health Spending* sheet.

   a. Format the cells as indicated below:

      i. **C4** through **I150**: currency with 2 decimal places

      ii. **J4** through **J150**: percentage with 1 decimal place

   b. AutoFit the widths of columns **A** through **K**.

   c. Apply *Green-Yellow-Red* color scale conditional formatting to cells **G4** through **G150**.

8. To better understand our data, we wish to create a PivotTable.

   a. Create a new PivotTable based on the data in cells **A3** through **K150** of the *Health Spending* sheet. Place the PivotTable on a new sheet named *Health Spending PivotTable*.

   b. On the PivotTable, do the following:

      i. Add the indication is more money was spent by government or private sources as a ***Filters*** field.

ii. Add the region and then the year as ***Rows*** fields.

iii. Add the government health spending, private health spending, foreign health spending, and total health spending as ***Values*** fields.

c. We need to perform formatting on our PivotTable.

i. Group the years into sets of 5 starting at 2000.

ii. Summarize the spending figures by averaging them.

iii. Format the cells as indicated below:

(1) **Average of Government Health Spending per Capita**, **Average of Private Health Spending per Capita**, **Average of Foreign Health Spending per Capita**, and **Average of Total Health Spending per Capita** fields: currency with no decimal places

9. We also wish to apply formatting to the *Scenarios* sheet.

a. Enter text in the cells as indicated below:

i. **A1**: `Healthcare Spending Scenarios for Low-Spending Regions`

ii. **A3**: `Scenario`

iii. **B5**: `Annual Growth`

iv. **C5**: `2023`

v. **D5**: `2024`

vi. **E5**: `2025`

vii. **F5**: `2026`

viii. **G5**: `2027`

ix. **H5**: `2028`

x. **I5**: `2029`

xi. **J5**: `2030`

xii. **K5**: `2031`

xiii. **L5**: `2032`

xiv. **M5**: `2033`

xv. **A6**: `Projected Sub-Saharan Africa Spending`

xvi. **B6**: `0%`

xvii. **C6**: `$79.37`

xviii. **A7**: `Projected South Asia Spending`

xix. **B7**: `0%`

xx. **C7**: `$82.49`

xxi. **A8**: `Gap between Sub-Saharan Africa and South Asia`

b. Merge (but not center) cells **A1** through **M1**.

c. Apply the *Heading 1* cell style to cell **A1**.

d. Apply background fill colors to the cells as indicated below:

i. **A5** through **M5**: *Accent 1, Lighter 40%*

ii. **A8** through **M8**: *Background 1, Darker 25%*

e. Format the cells as indicated below:

i. **B6** through **B7**: percentage with 2 decimal places

ii. **C6** through **M8**: currency with 2 decimal places

f. AutoFit the width of columns **A** through **B**. Set the width of columns **C** through **M** to 10.

10. On the *Scenarios* sheet, we wish to calculate information about possible healthcare spending in the future.

a. We wish to compute the gap between what Sub-Saharan Africa spends per-capita compared to what South Asia spends per-capita. Enter the formulas in the cells as indicated below.

i. **C8**: `=C7-C6`

ii. **C8** through **M8**: AutoFill the formula from cell **C8**.

b. We want to estimate future population scenarios.

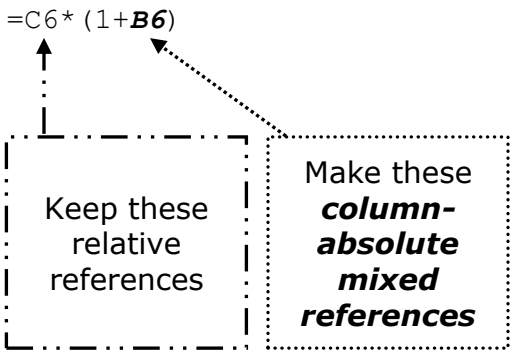
i. Enter the formula into the cell indicated below.

HINT: To avoid errors, copy-and-paste the provided formula.

(1) **D6**: `=C6*(1+B6)`

ii. We must adjust the future values formula so its cell references are correct when the formula is copied.

In cell **D6**, modify the cell references so they are column-absolute mixed or relative references as indicated:



iii. We will now AutoFill the modified formula. Enter the formula into the cells as indicated below:

(1) **D6** through **M7**: AutoFill the formula from cell **D6**.

11. We will now evaluate two different scenarios for healthcare spending growth in the two lowest-spending regions, South Asia and Sub-Saharan Africa.

a. The first scenario involves growth continuing at the same rate as they have historically.

i. Enter text in the cells as indicated below:

(1) **A3**: `Historic Growth Rates`

(2) **B6**: `3.18%`

(3) **B7:** `7.15%`

ii. There is nothing to do for this step. Please proceed to the next step.

iii. Using Scenario Manager, create a new scenario named `Historic Growth Rates`. Have the scenario work by changing the values of cells **A3**, **B6**, and **B7** to the values they contain now.

b. The second scenario involves Sub-Saharan Africa's spending growing to match that of South Asia by 2033, assuming that South Asia continues to follow its previous average annual rate of growth.

i. Enter text in the cells as indicated below:

(1) **A3**: `Closing Gap by 2033`

(2) **B6**: `7.15%`

(3) **B7:** `7.15%`

ii. Use Goal Seek to find an annual growth rate to $0 gap in spending in cell **M8**. Have Goal Seek change the value of cell **B6** until it locates the correct value.

iii. Using Scenario Manager, create a new scenario named `Closing Gap by 2033`. Have the scenario work by changing the values of cells **A3**, **B6**, and **B7** to the values they contain now.

12. We need to set up the *Analysis Questions* sheet so that it can store responses to the analysis questions.
    a. Enter text in the cells as indicated below:
        i. **A1**: `Question Step`
        ii. **B1**: `Response`
    b. Bold the contents of row **1**.
    c. AutoFit the width of column **A**. Set the width of column **B** to 100.
    d. Set the height for rows **2** through **4** to 110.
    e. Change the vertical alignment setting for columns **A** and **B** so that the text is displayed at the top of each row.
    f. Turn on text wrapping for column **B**.
13. Starting in row **2** of the *Analysis Questions* sheet, answer three of the five analysis questions below. Respond to one question per row. List the step whose question you are answering in column **A** (i.e., list `13a` for the question in Step 13a).
    a. A high amount of healthcare spending in Sub-Saharan Africa comes from foreign sources. Provide an example of a foreign program funding healthcare in this region.
    b. How might increased healthcare costs affect employee wages? Explain your rationale.
    c. The Gross Domestic Product (GDP) of a country affects how much money it can spend on healthcare. How might the amount of money spent on healthcare affect a country's GDP?
    d. In 2023, healthcare spending per capita in North America was about 15 times greater than in Latin America and the Caribbean. Does this mean that North Americans received 15 times better quality healthcare than those in Latin America? Why or why not?
    e. The United States spends more on healthcare than most European nations, yet it generally has a lower average life expectancy than these countries. What sort of factors might cause this?

Grading Rubric

This is a practice assignment and is worth no points. A comparable Homework would be worth 60 points and graded using this rubric, with partial credit awarded as appropriate:

Steps 3a-c	2 points total	Steps 9a-f	4 points total
Step 4	2 points	Steps 10a-b	8 points total
Steps 5a-f	2 points total	Steps 11a-b	6 points total
Steps 6a-d	10 points total	Steps 12a-f	4 points total
Steps 7a-c	3 points total	Steps 13a-e (pick 3 of 5)	3 points each
Steps 8a-c	10 points total		

The analysis questions in Steps 13a-e will be evaluated using this rubric:

Standard	Meets Requirements (1.5 points)	Does Not Meet Requirements (0 points)
Answer is reasonable.	Answer addresses the question prompt and is factually correct or a reasonable interpretation of available data.	Answer does not address the question prompt, is factually incorrect, or is an unreasonable interpretation of available data.
Answer is supported.	Logical rationale is provided to support the given answer.	Logical rationale is not provided to support the given answer.

Acknowledgments

The image in the introduction appears courtesy of the National Cancer Institute [6].

References

[1] "GDP per capita (current US$)," World Bank. Available: *http://data.worldbank.org/indicator/NY.GDP.PCAP.CD*. Accessed: July 18, 2026.
[2] "Current health expenditure per capita (current US$)," World Bank. Dec. 12, 2025. Available: *http://data.worldbank.org/indicator/SH.XPD.CHEX.PC.CD*.
[3] "Domestic general government health expenditure per capita (current US$)," World Bank. Dec. 12, 2025. Available: *https://data.worldbank.org/indicator/SH.XPD.PVTD.PC.CD*.
[4] "External health expenditure per capita (current US$)," World Bank. Dec. 12, 2025. Available: *https://data.worldbank.org/indicator/SH.XPD.EHEX.PC.CD*.
[5] "Domestic private health expenditure per capita (current US$)," World Bank. Dec. 12, 2025. Available: *https://data.worldbank.org/indicator/SH.XPD.PVTD.PC.CD*.

[6] National Cancer Institute, *Patient Room with Hospital Bed*. 2004. Available: *https://commons.wikimedia.org/wiki/File:Patient_room_with_hospital_bed.jpg*.