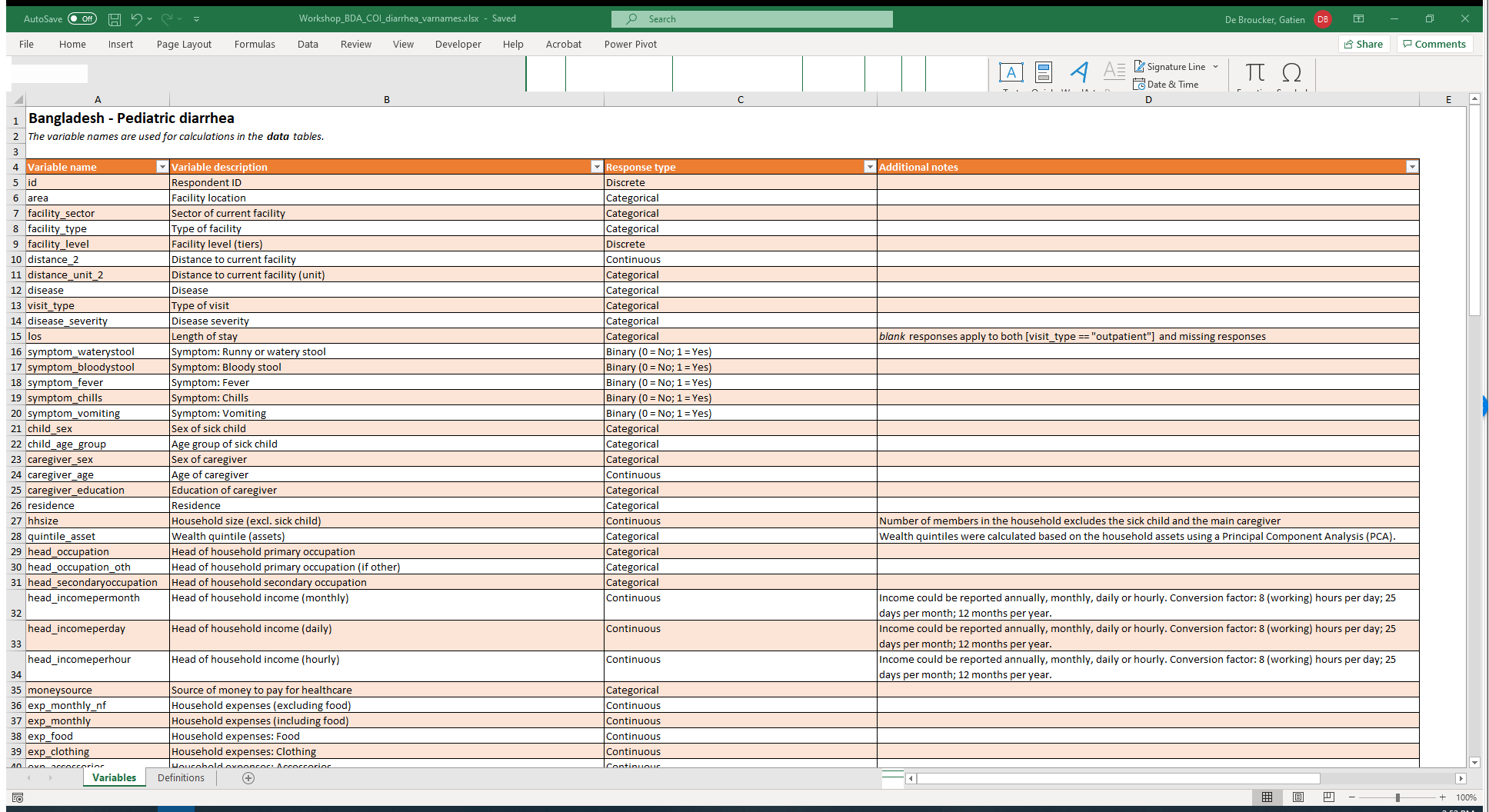
Assignment #1 – Estimating the cost of pneumonia and diarrhea in Bangladesh

**General instructions**

In this first assignment, you will generate costs from the household and societal perspectives – healthcare system costs have already been calculated – and provide some comments on the results. You will:

1. Choose your disease focus: pneumonia OR diarrhea.
2. Download the *varname* workbook with the variable names and labels. Use it to find your variables of interest and understand their structure.



1. Download the disease cost dataset for your preferred statistical software:  
   ***Workshop\_BDA\_COI\_pneumonia/diarrhea.xlsx***
2. Follow the instructions in this document to analyze the data, generate outputs, and discuss your findings. Variable names are indicated in italicized brackets: *[varname]*.
3. Submit **two files**:

* *Word document with your responses (as an editable .docx or .doc file)*
* *Your calculations in Excel (.xls or .xlsx files)*

**Data and assumptions**

Costs were originally reported in Bangladeshi Tasks; we converted them to **2018 US Dollars** using the following conversion rate: **US $1 = BDT 83.5**.

***Before – current – after***

Caregivers were interviewed about the costs they incurred at the current facility (where they were interviewed), as well as before and after that visit (over a phone follow-up).

The sector where care was sought for the disease is defined based on the current visit. Costs incurred before and after may have incurred in other sectors.

***Service (government) and direct (caregiver) costs***

The data come from a study conducted in 2017-19 to estimate the economic burden of pneumonia, diarrhea (both all cause/no restriction on etiology), and measles in children under five years old in Bangladesh and Uganda. Public, private for-profit (“private”), and private not-for-profit (“NGO”) healthcare facilities were included.

In this assignment and the dataset, you will see that only the government costs are reported for the healthcare system perspective. The researchers assumed that all service costs incurred by the private sector were transferred to the patients and their caregivers and were not reported.

Due to the limited data from private not-for-profit facilities, we will focus on healthcare sought at public and private for-profit (“private”) healthcare facilities.

Transportation costs before the current visit were not recorded.

***Indirect costs***

Indirect costs were estimated using the human capital approach. Researchers took the average income of the head of the household to value the time loss.

# Household costs

In the following table, you must calculate from the dataset the **mean household cost** for patients who received **inpatient care** *[visit\_type]* for each type of cost (direct medical, non-medical and indirect costs) by the time of the visit (before, current and after) and by sector *[facility\_sector]*, as laid out in the table below.

The variable name for costs incurred.

**current visit end in *[ \_2]* (*e.g.*, *[total\_dmc\_2]*),**

**before *[ \_1]***

**after *[ \_3]*.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | **Inpatient case** | | | |
|  | **Type of cost** | **Public** | | **Private for-profit** | |
| Mean ($) | (%) | Mean ($) | (%) |
| Before1 | Consultation fee |  |  |  |  |
| Investigations charges |  |  |  |  |
| Medications cost |  |  |  |  |
| Bed stay fee |  |  |  |  |
| Meals costs |  |  |  |  |
| Other non-medical costs |  |  |  |  |
| Current | Consultation fee |  |  |  |  |
| Investigations charges |  |  |  |  |
| Medications cost |  |  |  |  |
| Bed stay fee |  |  |  |  |
| Transportation costs |  |  |  |  |
| Meal costs |  |  |  |  |
| Other non-medical costs |  |  |  |  |
| After1 | Consultation fee |  |  |  |  |
| Investigations charges |  |  |  |  |
| Medications cost |  |  |  |  |
| Bed stay fee |  |  |  |  |
| Transportation costs |  |  |  |  |
| Meal costs |  |  |  |  |
| Other non-medical costs |  |  |  |  |
| Overall | **Total direct medical cost** |  |  |  |  |
| **Total direct non-medical cost** |  |  |  |  |
| **Total direct cost** |  |  |  |  |
| **Total indirect cost** |  |  |  |  |
| **Total overall cost** |  | **100%** |  | **100%** |
| **Total time loss** (in days) |  |  |  |  |
| **Total time loss** (in hours) |  |  |  |  |

Notes: 1 Costs from before (ending in \_1) and after (\_3) the current healthcare facility visit may have been incurred at a facility from a different sector and type than the one selected.

Now, you must calculate the mean household cost for patients who received **outpatient care *[visit\_type]*** for each type of cost (direct medical, non-medical and indirect costs) by the time of the visit (before, current and after) and by **sector** ***[facility\_sector]*,** as laid out in the table below.

A few caregivers reported paying bed fees for ambulatory care, likely related to hospital fees labeled as “bed charges”. Those costs should be negligible.

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| --- | --- | --- | --- | --- | --- |
|  |  | **Outpatient case** | | | |
|  | **Type of cost** | **Public** | | **Private for-profit** | |
| Mean ($) | (%) | Mean ($) | (%) |
| Before1 | Consultation fee |  |  |  |  |
| Investigations charges |  |  |  |  |
| Medications cost |  |  |  |  |
| Bed stay fee |  |  |  |  |
| Meal costs |  |  |  |  |
| Other non-medical costs |  |  |  |  |
| Current | Consultation fee |  |  |  |  |
| Investigations charges |  |  |  |  |
| Medications cost |  |  |  |  |
| Bed stay fee |  |  |  |  |
| Transportation costs |  |  |  |  |
| Meal costs |  |  |  |  |
| Other non-medical costs |  |  |  |  |
| After1 | Consultation fee |  |  |  |  |
| Investigations charges |  |  |  |  |
| Medications cost |  |  |  |  |
| Bed stay fee |  |  |  |  |
| Transportation costs |  |  |  |  |
| Meal costs |  |  |  |  |
| Other non-medical costs |  |  |  |  |
| Overall | **Total direct medical cost** |  |  |  |  |
| **Total direct non-medical cost** |  |  |  |  |
| **Total direct cost** |  |  |  |  |
| **Total indirect cost** |  |  |  |  |
| **Total overall cost** |  | **100%** |  | **100%** |
| **Total time loss** (in days) |  |  |  |  |
| **Total time loss** (in hours) |  |  |  |  |

Notes: 1 Costs from before (ending in \_1) and after (\_3) the current healthcare facility visit may have been incurred at a facility from a different sector and type than the one selected.

## Describe your findings

Discuss the findings you reported for inpatient and outpatient care in the public and private for-profit sectors. You should cover the following points:

1. What differences in household costs do you observe between the public and the private for-profit sectors?
   1. Does it suggest that patients using private for-profit are wealthier?
2. Which input takes the largest proportion of **direct medical** for inpatient and outpatient care?
3. Is there any difference in **direct non-medical** costs between type of visit and sectors?
   1. If yes, what do those differences say about seeking care in public and private facilities?
4. Review the **time loss** and the total **indirect cost**. Do they differ between the two sectors?
   1. Is the difference more pronounced for time loss or for the total indirect cost?
   2. Do you think this difference in indirect cost is mainly due to a higher average income for caregivers using private facilities?

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# Government costs

Government costs were reported as average cost per case for different types of costs. The cost to deliver care in private for-profit facilities was not reported as researchers assumed that the medical costs borne by the households for private facilities is equal or higher than the cost from the private sector’s perspective.

**As such, the facility costs (all starting with *[facilitycost\_ ]*) for private facilities will be blank or missing.**

You must calculate **the average cost for each input of the facility cost by type of visit and by facility level (*[facility\_level]* ranging from 1 to 4, see table below), as well as for all facility levels together**.

|  |  |  |  |
| --- | --- | --- | --- |
| **Types of cost** | | **Inpatient care** | **Outpatient care** |
| **ALL PUBLIC HEALTHCARE FACILITIES** | | | |
| Fixed | Capital |  |  |
| Recurrent | Overhead |  |  |
| Medical labor |  |  |
| Supplies |  |  |
| Medications |  |  |
|  | **Total overall cost** |  |  |
| **Public Medical College Hospitals – Tertiary level facility** *[facility\_level = 4]* | | | |
| Fixed | Capital |  |  |
| Recurrent | Overhead |  |  |
| Medical labor |  |  |
| Supplies |  |  |
| Medications |  |  |
|  | **Total overall cost** |  |  |
| **(Public) District Hospitals – Secondary level facility** *[facility\_level = 3]* | | | |
| Fixed | Capital |  |  |
| Recurrent | Overhead |  |  |
| Medical labor |  |  |
| Supplies |  |  |
| Medications |  |  |
|  | **Total overall cost** |  |  |
| **(Public) Upazila Health Centers – Primary level facility** *[facility\_level = 2]* | | | |
| Fixed | Capital |  |  |
| Recurrent | Overhead |  |  |
| Medical labor |  |  |
| Supplies |  |  |
| Medications |  |  |
|  | **Total overall cost** |  |  |
| **(Public) Union Health Centers – Primary level facility** *[facility\_level = 1]* | | | |
| Fixed | Capital |  |  |
| Recurrent | Overhead |  |  |
| Medical labor |  |  |
| Supplies |  |  |
| Medications |  |  |
|  | **Total overall cost** |  |  |

Discuss the findings you reported for inpatient and outpatient care in public healthcare facilities. You should cover the following points:

1. **Which inputs take the largest proportion of the government’s service cost** for inpatient and outpatient care?
2. In your opinion, what could explain the difference in costs across the different public healthcare facilities?
3. Only looking at households **with a public facility as their current visit**:
   1. do households pay for inputs that the government *also* pays for, such as medications?
   2. Do households or the government pay more per case of disease on medications?
   3. If the government is not charging any fee for medications, what could explain this cost for the households?

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# Societal costs

When aggregating societal costs from household and government cost estimates, we must:

1. Avoid double-counting costs
2. Identify any missing perspective or cost
3. Discuss the implication of the costing methods used

**To calculate the societal cost per case of disease**, **you will (sum the government and household costs),** and **(subtract any fee charged to the caregiver by public healthcare facilities)**.

**The consultation fee, the investigation charges, the bed stay fees, and the medication fees paid for the current visit at a public facility (not before, nor after) by the household were charged by the facility to cover its costs; thus, they must be subtracted from the government cost per disease case.**

🡪The resulting cost is the **net facility cost**.

While medications are usually provided for free in the public sector, there were frequent stock-outs at the time of data collection and caregivers most often had to purchase the medication elsewhere. Due to the data collection process, **the medication cost was also counted as a government cost and must thus be subtracted.**

Based on these assumptions, generate three new variables:

1. First, the **net** **facility cost**:

* For each patient in the public sector (as current visit), subtract the household’s consultation fee *[consult\_2]*, the investigation charges *[diagnos\_2]*, the bed stay fees *[bed\_2]*, and the medication fees *[medic\_2]* at the current visit from the total facility cost *[facilitycost\_total]*.
* For each patient in the private sector (as current visit), set the net facility cost to zero ($0).

1. Second, the **medical cost at the government facility**:

* For each patient in the public sector, sum the household’s consultation fee *[consult\_2]*, the investigation charges *[diagnos\_2]*, the bed stay fees *[bed\_2]*, and the medication fees *[medic\_2]* at the current visit.
* For each patient in the private sector, set the net facility cost to zero ($0).

1. Third, the (remainder) **medical cost**:

* For each patient in the public sector, sum all direct medical costs (or use *[total\_dmc]*), minus those included in the **medical cost at the government facility**.
* For each patient in the private sector, sum all direct medical costs (or use *[total\_dmc]*).

In the graph below, report the mean government and household costs by type of visit and sector, including the net facility cost, the medical cost at the government facility, and the (remainder) medical cost that you just calculated, as well as the household’s **non-medical cost** *[total\_nmc]* and **indirect cost** *[total\_indirectcost]*.

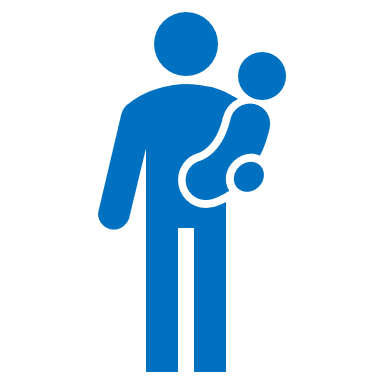
To edit the graph’s data, right-click on the graph and left-click on “Edit data”.

For illustration purposes only: the checked items were subtracted from the facility cost at public facilities.

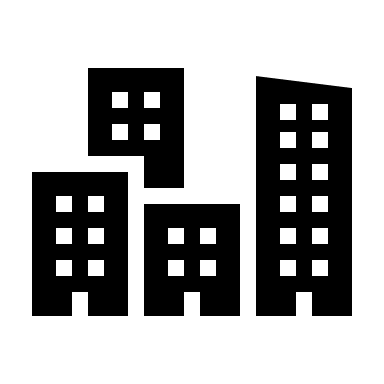
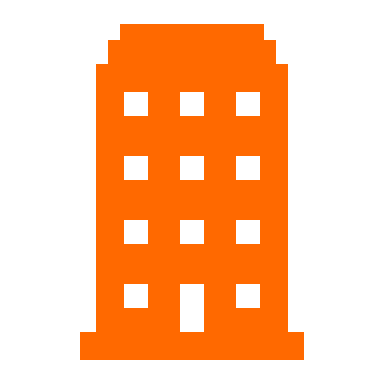
*Medical costs before & after*

*Non-medical costs*

*Indirect costs*



*Facility costs*



* Transportation costs
* Meal costs
* Other non-medical costs
* Indirect costs

Current visit only:

* **Consultation fee**
* **Investigation charges**
* **Bed stay fee**
* **Medications costs**

***Medical costs at current visit***

Before and after current visit:

* Consultation fee
* Investigation charges
* Medications costs
* Bed stay fee

Discuss your findings for the societal cost and overall. You should cover the following points:

1. Looking at the graph and numbers, **compare the total (government and household confounded) medical cost by sector.** 
   1. **Are both sectors comparable in terms of medical cost or is one sector costing more than the other?**
2. What cost influence most the societal cost?
3. **The household’s indirect costs were estimated using a human capital approach 🡨**. What does this imply for the societal cost estimate?
4. Can you think of any perspective or cost that we may be missing?

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