



Laterite Analytical Assessment

November 2017

Instructions

This exercise aims to gauge your capacity to analyse a dataset and present the findings to a non-technical audience. This is a task that you will routinely encounter while working at Laterite.

To complete this assessment, you will have to perform statistical analysis on a dataset and present the findings on a short two-page document. To analyse the dataset, you are free to use any statistical software package (Stata, R, Python, etc.). You may also consult any resources you like, except for other people. Please list any resources that you consulted (you can include these in the email).

Your task will be assessed on the proficiency, efficiency, clarity and replicability of your **writing, analysis** and **code**.

You are expected to complete this task within **24 hours** of receiving it. Please send it back to the Laterite employee that is managing your application process. You should send us back the following documents

- A **Microsoft Word document** (or other word processing document) of **maximum 1,000 words** in which you have completed the task below.
- **All the statistical code** you have used to do the analysis (e.g. Stata do file, R script, Jupyter Notebook, etc.)
- Any other dataset you might have used.

Please make sure to send us back all the documents in a **zip file**.

The Task

Laterite has just finished this week data collection for a project on Primary Education for the Ministry of Education (MINEDUC).

You have the dataset and have been asked to write a **policy memo** for MINEDUC on the **“Potential causes of repetition and dropout in Primary Education” covering Primary 1 (P1) to Primary 6 (P6)**. They want to discuss these preliminary findings at a management meeting tomorrow. The outcomes of this meeting will inform the overall direction for the final report, so correctly identifying and interpreting the key factors affecting repetition and dropout is very important.

You are responsible for **performing all the statistical analysis required** and **writing the memo**. You should remember that the target audience (MINEDUC’s senior management) do not have a statistical background.

The research manager wants you to address the following points in the policy memo and working files:

1. Rename or label the variables in dataset with meaningful names. (5 marks)
2. Create dummy variables for grade repetition and dropout outcomes, call them “repeated” and “dropout”. What are the overall rates of dropout and grade repetition for the population of students in Primary Education in 2012? (10 marks)
 - a. Grade repetition is defined as: *Being in school in 2012 and 2013, and being in the same grade in 2012 and 2013.*
 - b. Dropout is defined as: *Being in school in 2012 but leaving school in 2013 without completing secondary school.*
3. Describe in a few short paragraphs how grade repetition varies by grade in Primary Education. Include at least one chart or table for the population of students in school in 2012. (20 marks)
4. Is there a difference in overall dropout rates by gender for the population of students in Primary Education in 2012? If so is it statistically significant? Explain your findings in non-technical terms including any assumptions and limitations. (20 marks)
5. What variables are good predictors that a child in Primary Education would repeat the same grade in 2012 and 2013? Discuss what causes grade repetition, including how strong the evidence is. (20 marks)
6. Briefly list up to three strengths and three limitations of this data set for analysis of dropout in Rwanda’s schools. (15 marks)

Additional marks will be given for:

- The client readiness of your written document (5 marks)
- The quality of your code (5 marks)

Annex 1. Variable Description

	Variable	Description
1	province	Province
2	district	District
3	ur2012	Urban/Rural classification in 2012 (4 levels)
4	weight	Sampling weight
5	Consumption	Aggregate consumption in January 14 Prices
6	s1q1	Sex
7	s1q3y	Age
8	s1q13	Father still alive
9	s1q14	Mother still alive
10	s3q4	Suffered health problems in the last 4 weeks
11	s4aq6a	Grade attended during school year 2012
12	s4aq6b	Grade attended during school year 2013
13	promoted	Was promoted at the end of year 2012
14	repeated	Repeated at the end of year 2012
15	dropout	Dropped out at the end of year 2012
16	s4aq8	Type of school attended in previous 12 months
17	s4aq9	Problem experienced at school
18	s4aq11h	Total education expenses
19	s4aq12	Who paid school expenses over last 12 months
20	s4aq14	Number of school days missed in the last 7 days
21	s4aq15	Reason for not attending school
22	s4aq17	Reason for leaving school
23	s4bq3	Can read a letter or simple note
24	s4bq4	Can write a letter or simple note
25	s4bq5	Can perform a written calculation
26	s6aq2	Work on household farm