

Long-Run Analysis Plan for Education Outcomes: Does the Intervention Affect MSCE Scores and Qualification for University Admission?

This document describes in words the code previously uploaded as PAP_MSCE. The analysis described in this document exactly matches the previously uploaded code (excluding the generation of simulation code used for testing).

Hypotheses

1. **Access to Wikipedia improves MSCE outcomes for low-achieving students.** Students with below-median baseline achievement who received the intervention will have higher MSCE pass rates, higher aggregate scores, a greater probability of qualifying for university admission, and higher individual subject scores in English, Biology, Mathematics, and Chichewa.
2. **No effect on high-achieving students.** Students with above-median baseline achievement are not expected to benefit from the intervention.
3. **Effects may differ by timing of exposure.** Treatment effects are estimated separately for Form 4 students (same-year intervention) and Forms 2-3 students (earlier intervention).

Data

- For Form 4 students, we use administrative MSCE data (already in possession and previously analysed).
- For Forms 2 and 3, we plan to use administrative data if available; otherwise we will use survey data for students with missing administrative records.
- We anticipate that administrative data will be missing by entire classes and/or schools, so there is no risk of differential attrition in this particular administrative data.

Research Design

All regressions split by high and low baseline achievers, as we do not expect any effect on high achievers. Treatment effects are estimated separately for:

1. **Same-year intervention** (Form 4 students)
2. **Earlier intervention** (Forms 2 and 3 students)

Covariates

- Baseline English grade
- Indicator for missing baseline English grade

Outcome Variables

1. MSCE Pass

A student passes the MSCE if they meet either of the following criteria:

- A pass (score < 9) in at least six subjects, including English, with at least one credit (score ≤ 6); **or**
- A pass in at least five subjects, including English, with at least three credits.

Students who did not write exams are coded as not passing. Students who failed English (score = 9) cannot pass. Missing data at the school level is coded accordingly.

2. University Admission

A student qualifies for admission to a public university if they obtain credits (score ≤ 6) in at least six subjects, including English.

3. MSCE Aggregate Score

The aggregate score is calculated as the sum of a student's best six subject scores. The MSCE grading scale is:

Score	Grade
1-2	Distinction
3-6	Credit
7-8	Pass
9	Fail

Students with fewer than six exams or who failed English are assigned a missing aggregate. Lower raw scores indicate better performance; for ease of interpretation, individual subject scores (English, Biology, Mathematics, Chichewa) are transformed so that higher values indicate better performance.

4. Individual Subject Scores

- English
- Biology
- Mathematics
- Chichewa

Estimation

For each outcome, we estimate:

```
reghdfe Y T_low T_high covariates, absorb(strata) vce(robust) noconstant
```

where: - **Y** is the outcome variable - **T_low** is the treatment indicator interacted with below-median baseline achievement - **T_high** is the treatment indicator interacted with above-median baseline achievement - **Strata** fixed effects are absorbed - Robust standard errors are used

Each regression is run separately for Form 4 students (same-year intervention) and Forms 2-3 students (earlier intervention).