

The Leaky College Pipeline: Evidence from Administrative Data in Uganda

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Educational attainment reflects a long sequence of constrained decisions, but the structure of these constraints differs sharply across settings. In high- and middle-income countries, most youths complete secondary school, and post-secondary attainment is high (OECD, 2025). A large literature from these settings examines college application behavior (Bleemer, 2022; Hastings et al., 2016; Hoxby and Avery, 2013) and educational transitions (Ahimbisibwe et al., 2025; Fiala et al., 2022). Much less is known about how students progress through the schooling pipeline in low-income countries. Existing work has largely focused on secondary school choices rather than tracking students through university application and admission (Ajayi, Friedman and Lucas, 2017; Lucas and Mbiti, 2012).

In this paper, we use linked administrative data from Uganda to track students from primary school through university application. We identify patterns in who sits and passes national exams, and who applies for and receives merit-based scholarships to public universities.

We find that many high-performing students from disadvantaged districts fail to persist through the pipeline. Attrition occurs throughout primary and secondary schooling, resulting in a pool of students eligible for selective university admission that is already highly stratified by socioeconomic background. The allocation of merit scholarships is heavily concentrated in

a small number of secondary schools that disproportionately serve students from wealthier districts. As a result, many high-ability, low-income students never reach the margin where financial aid can matter.

Our findings highlight access to higher education as the outcome of a cumulative process rather than a single transition point. Policies focused narrowly on college access risk missing a large share of talented students lost earlier in the pipeline, suggesting a need for reforms to basic education that broaden access to the college application stage.

I. The Education System in Uganda

Uganda’s formal pre-university education system consists of seven years of primary school, four years of lower secondary, and two years of upper secondary. National exit examinations for each of these levels – respectively, the Primary Leaving Examination (PLE), ordinary or “O-level” exam, and advanced or “A-level” exam – determine academic progression. These exams are administered and graded by the Uganda National Examinations Board (UNEB), an institution independent of schools. Although public primary and secondary school are fee-free, school quality and instructional environments are highly variable (World Bank and Government of Uganda, 2002).

Uganda’s higher education sector is dominated by the public university system, which charge high tuition fees. For many low-income students, cost remains a binding constraint. The government offers a limited number of national merit scholarships each year, eligibility for which is determined exclusively by students’ performance on A-level exams.¹ Students apply for these scholarships by ranking univer-

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¹A smaller set of scholarships are allocated via the separate “District Quota” scheme to high exam performers within each district.

sity programs prior to observing their national exam scores or admission cutoffs, with admissions determined by program-specific cutoffs. Exam results are released several months after applications are submitted. These government-sponsored scholarships are offered exclusively at public universities and cover tuition, room, and board for the full duration of study. Students who are not admitted under government sponsorship may subsequently apply under private schemes in public universities, private universities, pursue non-university routes (such as technical schools), or forgo enrollment altogether.

Less than 5% of Ugandan adults hold a college degree. Estimated Mincer returns to schooling are high at all levels — around 8% for primary, 10% for secondary, and 12% for tertiary schooling (Peet, Fink and Fawzi, 2015).

II. Data

Standardized Test Data Our data includes the universe of individual linked student examination records from UNEB: PLE, O-level, and A-level. These records also report gender as well as school identifiers which allow us to locate schools within Uganda’s 128 districts.

College Scholarship Data All applications submitted under the centralized merit scholarship scheme are administered by the Public University Joint Admissions Board (PUJAB). These records list applicants’ ranked program–university choices across all public universities, allowing us to observe stated preferences at the time of application. We focus on the universe of these applications from 2018-2021.

The set of students admitted under the merit scholarship scheme is recorded in administrative data and publicly released admission lists, which report the major and university under which each student was admitted.²

Except where otherwise specified, our analysis sample consists of all students who sat the Primary Leaving Examination (PLE) in 2011-2014, *or* O-levels in 2015-2018, *or* A-levels in 2017-2020, *or* who applied for merit scholarships for the academic years beginning in 2018-2021. These windows correspond to normal grade progression for four cohorts, though we include the full set of matched exams for any

²Students not admitted on merit scholarships may be admitted under district quota scheme, or as tuition-paying students.

TABLE 1—SUMMARY STATISTICS

	Mean	SD
Primary	N: 2,501,550	
Female	0.49	(0.50)
O-level	N: 1,394,954	
Female	0.49	(0.50)
Outside home district	0.42	(0.49)
On-time progression	0.79	(0.41)
A-level	N: 426,881	
Female	0.41	(0.49)
Outside home district	0.57	(0.50)
On-time progression	0.83	(0.37)
Applications	N: 160,435	
Female	0.45	(0.50)
Outside home district	0.57	(0.49)
On-time progression	0.99	(0.08)
Merit Admissions	N: 10,277	
Female	0.39	(0.49)
Outside home district	0.70	(0.46)

Note: Sample includes all students who sat PLE 2011-2014, O-level 2015-2018, A-level 2017-2020, or applied for scholarships for academic years beginning 2018-2021. ‘Home district’ is self-reported in scholarship applications, and otherwise inferred from PLE district. ‘On-time progression’ indicates that the timing of the exam (or application) corresponds to expected grade progression.

student meeting at least one of these year criteria. As Table 1 shows, on-time grade progression is common.

III. Results

The Leaky Pipeline Large shares of students drop out of the education system at every stage. Figure 1 illustrates this by following all students from the 2011 PLE cohort through to the college scholarship application stage. Of the nearly 600,000 students who sat the PLE, 8% failed, while 39% passed but dropped out before sitting O-levels. A majority of O-level passers dropped out before sitting A-levels. Only 17% of the original cohort eventually sat A-levels, and only 6% applied for scholarships.

At each juncture, the average continuing student scores higher than the average dropout — but there is considerable overlap in the distributions (see Appendix Figure A3). The top quintile of PLE takers who did not sit A-levels scored well above the bottom quintile of those who did, suggesting that non-academic constraints prevent many capable students from advancing.

Regional Concentration At each successive

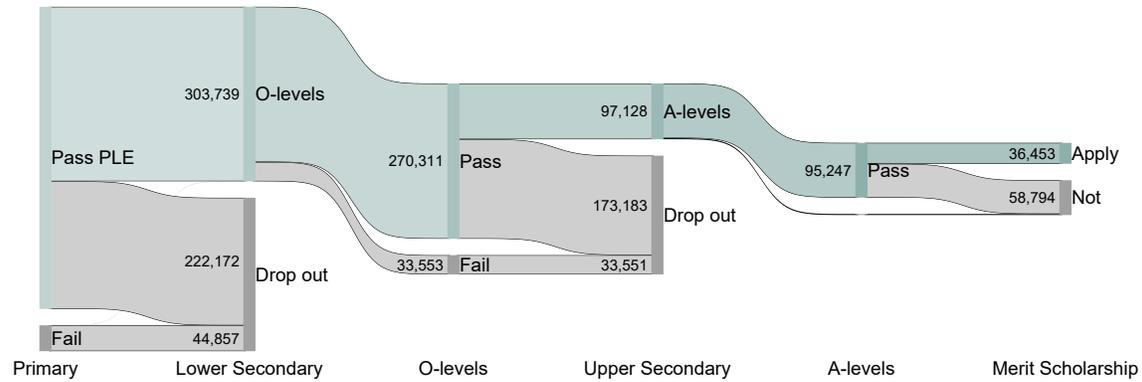


FIGURE 1. THE LEAKY PIPELINE

Note: Progression of the 2011 primary leaving cohort through O-levels, A-levels, and merit scholarship applications.

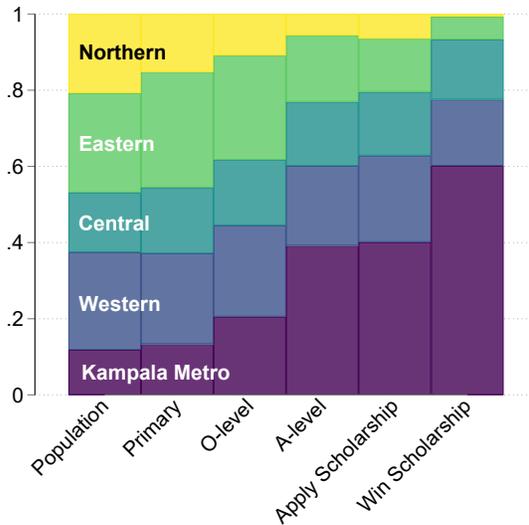


FIGURE 2. SHARE OF STUDENTS BY REGION AND LEVEL

Note: The figure plots the regional distribution of exam takers across stages of the educational pipeline, and of the 2014 census population. “Central” excludes the Kampala metropolitan area.

step in the education system, students are more concentrated in the metropolitan area of the capital, Kampala.³ Figure 2 shows that 62% of merit scholarships go to Kampala A-level students. This is partly driven by higher continuation rates among students originally from Greater Kampala (see Appendix Figure A4). But it also reflects student mobility: at each educational stage, many move across districts (see Table 1).

³We define the Kampala Metropolitan area as the districts of Kampala, Wakiso, and Mukono.

TABLE 2—CORRELATION: MOBILITY AND POVERTY

	A-level outside home district		
Poverty (Z)	0.054*** (0.015)	0.079*** (0.018)	0.184*** (0.036)
N	403,139	160,405	10,277
Mean	0.567	0.572	0.703
Sample	All	Applied	Won

Note: This table regresses a dummy for whether a student sat A-level outside their home district (defined as in Table 1) on a standardized measure of the poverty of her home district. Sample by column: (1) all students; (2) scholarship applicants; (3) merit scholarship winners.

Geographic concentration in educational attainment closely mirrors regional income disparities: students from poorer districts are far less likely to persist through successive stages of the pipeline (see Appendix Figure A5).⁴ Those who do persist often do so by moving or boarding in a place with greater opportunity.

Table 2 shows the positive correlation among A-level takers between a student’s home-district poverty level and her likelihood of sitting A-levels in a district besides her own. Narrowing the sample to more ultimately successful students strengthens the correlation. This suggests that for many students from poor districts, the best chance for educational advancement is a costly relocation – and highlights the socio-economic selectivity in the resulting pool of stu-

⁴We use the Uganda Bureau of Statistics district-level poverty rate, defined as small-area estimated poverty headcount rates.

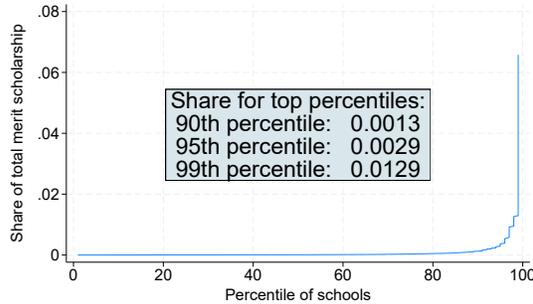


FIGURE 3. PERCENTILE PLOT: SHARE OF TOTAL MERIT SCHOLARSHIPS ACROSS SCHOOLS

Note: This figure plots the share of total merit scholarships received by school on the y-axis, with school percentile by share of total merit scholarships on the x-axis. The data include all schools with at least one scholarship applicant in the relevant years of our sample. The label box shows minimum values for the 90th, 95th, and 99th percentiles.

dents.

School-level Concentration Merit scholarships are highly concentrated at a small number of secondary schools (Figure 3). Fully 80% of all merit scholarships are awarded to students applying from just 7% of the schools represented among applicants. Even more strikingly, 7% of all scholarships are awarded to students from a single secondary school. This concentration is even starker when all schools with A-level takers are included, since many send no applicants at all (see Appendix Figures A6 and A7).

IV. Discussion and Conclusion

Our findings have important implications for the design and effectiveness of financial aid in low-income settings. While often framed as tools for expanding access to higher education, merit scholarships in Uganda primarily reward advantages accumulated earlier in the schooling process. Full-ride awards are heavily concentrated in a small set of secondary schools serving students from mostly wealthier districts. Talented students from poorer districts are far less likely to attend these feeder schools and, consequently, to receive merit-based funding – even conditional on early academic achievement.

Our results suggest that university merit scholarships may function as a regressive transfer, reallocating public resources toward students who are already more likely to come from advantaged backgrounds and who have suc-

cessfully navigated earlier stages of the educational pipeline. Because many high-ability, low-income students exit the system well before the university application stage, they never reach the margin at which financial aid can influence college entry. In this sense, merit-based aid may reinforce rather than offset existing inequalities in educational attainment.

The winnowing which occurs over successive stages of schooling limits the effectiveness of many potential policy levers at broadening college access. Although application information and assistance have been shown to improve post-secondary outcomes in some settings (Larroucau et al., 2024), our evidence suggests that few Ugandan students currently miss out on scholarships due to suboptimal application strategy. This is partly because early selective attrition sharply constrains the eligible applicant pool (Appendix Section A8).

Uganda’s existing system of district quotas partially mitigates these dynamics by allocating a subset of scholarships using place-based criteria. Its effectiveness is mechanically limited, however, by the small number of students who reach the A-level stage in many poorer districts. Moreover, district quotas do little to address within-district inequality: low-income students in wealthier districts remain disadvantaged if they cannot afford attendance at elite secondary schools.

Means-tested subsidies offer a promising way to target support to those who most need it (Londoño-Vélez et al., 2024). The challenge of conducting means tests in a highly informal economy is non-trivial, but Uganda’s own success at expanding secondary access with targeted subsidies through Universal Secondary Education (USE) offers a potential blueprint (Barrera-Osorio et al., 2020).

Ultimately, increasing the flow of students through the college pipeline requires fixing the leaks. A-level schooling entails substantial direct and indirect costs, including hidden and “voluntary” fees, as well as the travel or boarding which may be necessary to attend a high-quality school. It is costly to build schools, staff them with capable teachers, and fully abolish user fees (Crawford and Ali, 2022). But expanding public access is the key for breaking the link between privilege and opportunity, and can crowd in student investment (Sandholtz, 2024;

Ferreira and Sandholtz, 2024).

Overall, our results underscore that access to higher education is the outcome of a cumulative process. Policies focused narrowly on merit-based aid at the tertiary level are unlikely to reach many high-ability, low-income students unless paired with reforms that improve the access and quality of basic education earlier in the pipeline.

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