Beyond rankings: Regional inequality in primary educational achievement in Tanzania, 2019–2023

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ABSTRACT

Regional inequality in educational achievement provides an important basis for examining how primary educational outcomes are distributed across areas and whether differences between regions are narrowing, widening, or persisting over time. Guided by educational equity theory, this study examined the distribution and temporal pattern of Tanzania's Primary School Leaving Examination (PSLE) pass rates across 26 Mainland regions from 2019 to 2023. Using a quantitative documentary design, the study analysed regional pass rates through measures of dispersion and inequality, including standard deviation, range, interquartile range, coefficient of variation, Gini coefficient, Theil index, percentile gaps, Lorenz curves, distribution plots, and linear trend analysis. The results show that the mean regional pass rate remained relatively high but declined slightly from 81.30% in 2019 to 80.57% in 2023. Substantial regional differences persisted, with the coefficient of variation increasing from 7.99% to 8.35%, the Gini coefficient from 0.045 to 0.046, and the range from 23.60 to 28.10 percentage points. However, none of the principal inequality measures showed a statistically significant linear trend. The findings demonstrate that relatively stable aggregate performance can coexist with persistent geographical inequality, highlighting the limitations of averages and rankings for monitoring educational equity and the value of distribution-sensitive, longitudinal analysis. The study recommends that education authorities complement average pass rates and regional rankings with distribution-sensitive indicators and targeted regional monitoring to inform more equitable resource allocation.

Keywords: Educational Equity; Educational Inequality; PSLE Pass Rates; Regional Variation; Tanzania

I. INTRODUCTION

Educational equity concerns not only expanding participation and improving average learning outcomes, but also whether students have comparable opportunities to achieve across different social and geographical contexts. Internationally, attention has shifted from aggregate measures of educational performance to the distribution of educational opportunities and outcomes across population groups and places (Organisation for Economic Co-operation and Development [OECD], 2018; United Nations Educational, Scientific and Cultural Organisation [UNESCO], 2020). Consequently, improvements in national examination performance may coexist with persistent geographical disparities when gains are unevenly distributed across regions. Educational progress is commonly interpreted through changes in aggregate achievement or the relative ranking of geographical units. Such approaches provide important performance information but may obscure how evenly educational outcomes are distributed across places. A system may maintain a relatively high average achievement while substantial geographical differences persist. The distinction between average performance and the distribution of performance is therefore central to understanding whether educational improvement is accompanied by greater geographical equity.

Tanzania provides a useful setting for examining whether national education reforms have translated into geographically equitable outcomes. Although the Primary Education Development Programme (PEDP) expanded primary-school access, and subsequent fee-free education reforms reduced financial barriers to participation (Basic Education Development Committee (BEDC), 2001, United Republic of Tanzania [URT], 2017, 2023), evidence of differences in school conditions and learning outcomes indicates that expanded access has not necessarily produced comparable outcomes across locations (World Bank, 2018). This raises an important equity question: whether improvements in educational achievement are broadly distributed across regions or remain spatially uneven.

Across African education systems, national indicators can conceal substantial geographical disparities in educational outcomes. Graetz et al. (2018) demonstrated subnational variation in educational attainment across Africa, while Kassile (2014) documented regional differences in Tanzania's Primary School Leaving Examination (PSLE) pass rates. These findings highlight the importance of examining achievement distributions rather than relying solely on national averages. Ferreira and Gignoux (2014) similarly distinguish average achievement from inequality, suggesting that improved average performance does not necessarily indicate reduced disparities. Regional rankings also provide limited evidence of inequality because they show relative positions without measuring the magnitude of differences between regions. Although previous studies establish geographical disparities in Tanzania, their findings do not establish whether regional PSLE inequality narrowed, widened or remained stable during 2019–2023. Maliti (2019) examined

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longer-term educational attainment inequalities rather than annual examination outcomes. This study addresses the resulting empirical gap by analysing regional PSLE pass rates across Mainland Tanzania from 2019 to 2023 using complementary inequality measures. It examines both the magnitude and temporal patterns of geographical inequality, providing evidence to strengthen educational equity monitoring beyond averages and rankings

This study addresses this gap by examining regional PSLE pass rates in Mainland Tanzania from 2019 to 2023 as a longitudinal distribution of educational achievement. It makes three related contributions. First, it reframes regional examination performance as a distributional equity issue rather than solely a ranking exercise. Second, it combines complementary measures of dispersion and inequality to distinguish the magnitude and distribution of regional differences from changes in individual regional performance over time. Third, it demonstrates how aggregate stability can coexist with substantial movement within individual regions, highlighting the importance of distribution-sensitive monitoring for understanding geographical equity.

1.1 Statement of the Problem

Despite successive education reforms in Tanzania aimed at improving equity in access and educational outcomes, substantial regional variation in examination performance remains evident. Although regional PSLE pass rates are routinely reported, they are commonly presented as descriptive statistics or annual rankings, which show relative performance but provide limited evidence of the magnitude, distribution, and persistence of regional differences over time. Consequently, changes in regional rankings alone cannot establish whether geographical disparities in educational outcomes are narrowing, widening, or remaining stable. The problem is therefore not simply the absence of regional examination data, but the limited use of these data to examine the distribution and temporal behaviour of educational outcomes. Ranking regions can identify relative positions, but it cannot establish whether the overall geographical distribution is becoming more or less unequal. Similarly, an increase or decrease in the mean does not necessarily indicate a corresponding change in the distribution of achievement. Without distribution-sensitive and longitudinal analysis, educational monitoring may therefore conflate changes in average performance with changes in geographical equity. The present study addresses this analytical problem by examining whether the distribution of regional PSLE achievement changed systematically between 2019 and 2023 and what the resulting pattern reveals about geographical inequality in primary educational achievement.

1.2 Research Objectives

i. To examine the distribution and magnitude of geographical inequality in PSLE achievement across Mainland Tanzania from 2019 to 2023.
ii. To determine whether geographical inequality in PSLE achievement narrowed, widened, or remained stable between 2019 and 2023, and to examine the implications of these patterns for educational equity monitoring.

II. LITERATURE REVIEW

2.1 Theoretical Review: Educational Equity Theory

This study is guided by Educational Equity Theory, which conceptualises equity as fair opportunities and outcomes across groups, not merely equal provision (Ferreira & Gignoux, 2014; Kelly, 2015). Within this framework, geographical location is an important dimension of equity because differences in educational resources, school conditions and socioeconomic contexts can produce unequal learning opportunities and outcomes (Graetz et al., 2018; Lindsjö, 2018; Sumida & Kawata, 2021). Thus, persistent differences in regional PSLE pass rates indicate geographical variation in educational achievement, rather than simply differences in regional rankings.

The framework further implies that educational equity should be assessed from the distribution of outcomes across regions and over time. Accordingly, this study uses the coefficient of variation, Gini coefficient, Theil index and P90–P10 gap to capture complementary dimensions of regional inequality (Rodriguez-Segura et al., 2021; Kelly, 2015; Nachbauer & Kyriakides, 2020). From the perspective of the framework, declining inequality measures would indicate greater regional equality, whereas increasing values would indicate widening disparities. The framework therefore provides the analytical link between geographical equity, distribution of PSLE achievement, measurement of regional inequality, and changes in inequality over time

2.2 Empirical Review

2.2.1 Distribution and Magnitude of Geographical Inequality

Evidence from sub-Saharan Africa demonstrates that national educational indicators can conceal substantial geographical disparities. Graetz et al. (2018) mapped subnational variation in educational attainment across Africa, while Sumida and Kawata (2021) examined urban–rural learning gaps across 15 sub-Saharan African education systems. Although these studies demonstrate the importance of geographical disaggregation, they do not directly quantify inequality across all administrative regions using annual examination outcomes. Their findings establish the relevance

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of spatial analysis but leave the distribution and magnitude of regional examination achievement insufficiently examined.

In Tanzania, Kassile (2014) identified regional differences in Primary School Leaving Examination (PSLE) pass rates and examined their associations with educational resources and parental education. Further evidence demonstrates that educational quality varies across geographical contexts. Lindsjö (2018), for example, examined primary education in urban and rural settings in Iringa Region, relating educational quality to living standards and infrastructure access. Similarly, Ndijuye and Beatus (2024), using a mixed-methods approach, investigated urban–rural disparities in early literacy acquisition, including the mediating roles of home and school contexts. Nevertheless, these studies primarily examined factors associated with educational performance rather than systematically quantifying inequality across the regional distribution. Ferreira and Gignoux (2014) likewise emphasise the need to distinguish average achievement from inequality in educational outcomes. This distinction is important because national averages may conceal substantial disparities between regions. Accordingly, an empirical gap remains in the systematic measurement of the magnitude and distribution of regional PSLE inequality across Mainland Tanzania. This study addresses this gap by analysing regional pass rates from 2019 to 2023 using dispersion and inequality measures, including the coefficient of variation, Gini coefficient, Theil index and P90–P10 gap.

2.2.2 Geographical Inequality and Implications for Educational Equity Monitoring

Longitudinal analysis is needed to establish whether geographical disparities in primary education narrow, widen or remain stable. Using Tanzanian survey data from 1991 to 2015, Maliti (2019) reported declining educational inequality between rural and urban areas and between Dar es Salaam and other regions. However, because the study examined educational attainment rather than annual regional Primary School Leaving Examination (PSLE) pass rates, it cannot establish the trajectory of examination-based inequality during 2019–2023. Average performance and regional rankings also provide an incomplete account of equity. Changes in the national mean do not necessarily indicate changes in inequality, while rankings show relative positions without measuring the magnitude of differences between regions. Sumida and Kawata (2021) similarly found that average learning performance could improve while urban–rural gaps widened in several sub-Saharan African education systems. Distribution-sensitive measures are therefore needed to distinguish changes in average achievement from changes in the distribution of regional performance (Ferreira & Gignoux, 2014; Rodriguez-Segura et al., 2021).

The empirical gap is the limited longitudinal evidence on whether regional PSLE inequality in Mainland Tanzania narrowed, widened or remained stable between 2019 and 2023. This study addresses the gap by comparing regional pass rates and complementary inequality indicators over the period. The analysis identifies distributional patterns but does not establish their underlying causes.

III. METHODOLOGY

3.1 Research Design

The study employed a quantitative documentary analysis design to examine the distribution and temporal changes in geographical inequality in Primary School Leaving Examination (PSLE) achievement. Documentary analysis enables systematic examination of existing records to address research questions using documented evidence (Bowen, 2009). A descriptive longitudinal approach was appropriate because the study compared regional pass-rate distributions over five years without seeking to establish causal relationships.

3.2 Study Area

The study covered Mainland Tanzania, focusing on regional PSLE pass rates from 2019 to 2023. This scope enabled comparison of geographical disparities across administrative regions and assessment of changes in their distribution over time. Zanzibar was excluded because the study specifically examined Mainland Tanzania.

3.3 Target Population

The target population comprised all administrative regions of Mainland Tanzania represented in official PSLE records during 2019–2023. At the time this study was conducted, the most recent years, 2024, 2025, and 2026, were not yet officially published. The study used aggregated regional pass rates rather than individual pupil records, with regional PSLE pass rate (%) serving as the principal indicator of educational achievement.

3.4 Sampling and Sample Size

A census approach was adopted to include all 26 regions represented in the dataset. The analytical sample comprised 130 region-year observations (26 regions × five years), provided that all regions had complete records for each year. The region-year was the unit of analysis. This approach eliminated sampling error associated with selecting regions, although measurement and reporting errors remained possible.

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3.5 Data Collection Instruments and Procedures

A structured data-extraction matrix was used to record the year, region and corresponding PSLE pass rate from National Examinations Council of Tanzania (NECTA) records and *Basic Education Statistics in Tanzania* (BEST) publications. Systematic extraction supports consistent recording and verification of documentary evidence (Bowen, 2009; Dalglish et al., 2020). The data were checked for completeness, consistency of regional names and comparability across years. Discrepancies were verified against the relevant official records before analysis.

3.6 Data Analysis

Analysis followed the two research objectives. For the first objective, descriptive statistics, including the mean, median, minimum, maximum, range, quartiles and interquartile range, were used to characterise the distribution of regional pass rates. The coefficient of variation, Gini coefficient, Theil index and P90–P10 gap assessed complementary dimensions of geographical inequality. Boxplots and Lorenz curves provided graphical evidence of distributional patterns. Using multiple indicators was important because average achievement and inequality capture distinct aspects of educational outcomes (Ferreira & Gignoux, 2014; Kelly, 2015; Nachbauer & Kyriakides, 2020).

For the second objective, annual inequality measures were compared to establish whether geographical inequality narrowed, widened or remained relatively stable. Linear trend models estimated the direction and magnitude of change, although results were interpreted cautiously because each model contained only five annual observations. Regional performance trajectories were also examined to identify changes that aggregate indicators might conceal. Finally, the implications for equity monitoring were assessed by comparing the information provided by averages and rankings with that provided by distribution-sensitive measures. The analysis remained descriptive and non-causal.

3.7 Ethical Considerations

The study used secondary, aggregated examination data from official documentary sources. No individual pupils were identified or directly involved. The analysis maintained appropriate source attribution, data accuracy and responsible reporting of regional results.

IV. FINDINGS & DISCUSSIONS

4.1 Findings

This section presents findings on the distribution and extent of geographic inequality in PSLE achievement throughout Mainland Tanzania from 2019 to 2023. Additionally, it examines whether the disparity decreased, increased, or stayed constant over time, and what this indicates about the shortcomings of average- and ranking-based methods of tracking educational equity.

4.1.1 Distribution and Magnitude of Geographical Inequality in PSLE Achievement

The first objective examined the distribution and magnitude of geographical inequality in Primary School Leaving Examination (PSLE) achievement across Mainland Tanzania from 2019 to 2023. The findings show that relatively high average performance coexisted with substantial differences between regions. As presented in Table 1, the mean regional pass rate declined from 81.30% in 2019 to 80.57% in 2023, while the median decreased from 80.05% to 79.28%. In contrast, the range increased from 23.60 to 28.10 percentage points. The coefficient of variation rose from 7.99% to 8.35% between the two endpoints, while the Gini coefficient increased slightly from 0.045 to 0.046. These results indicate that regional disparities persisted despite relatively stable average achievement.

Table 1

Annual Descriptive and Inequality Indices

Year	Regions	Mean	SD	Range	CV %	Gini	IQR
2019	26	81.30	6.50	23.60	7.99	0.045	11.15
2020	26	82.30	6.80	22.00	8.26	0.046	10.70
2021	26	81.88	6.38	26.80	7.79	0.043	8.75
2022	26	79.77	6.72	28.80	8.42	0.046	8.68
2023	26	80.57	6.73	28.10	8.35	0.046	10.27

Figure 1 further illustrates the distribution of regional pass rates. The boxplots show variation in dispersion and the interquartile range across years, demonstrating that similar annual means do not necessarily correspond to similar distributions. The interquartile range declined from 11.15 percentage points in 2019 to 10.27 in 2023, although it fluctuated during the intervening years. This pattern suggests that changes in the middle 50% of the regional distribution did not consistently follow changes in the distance between the highest- and lowest-performing regions.

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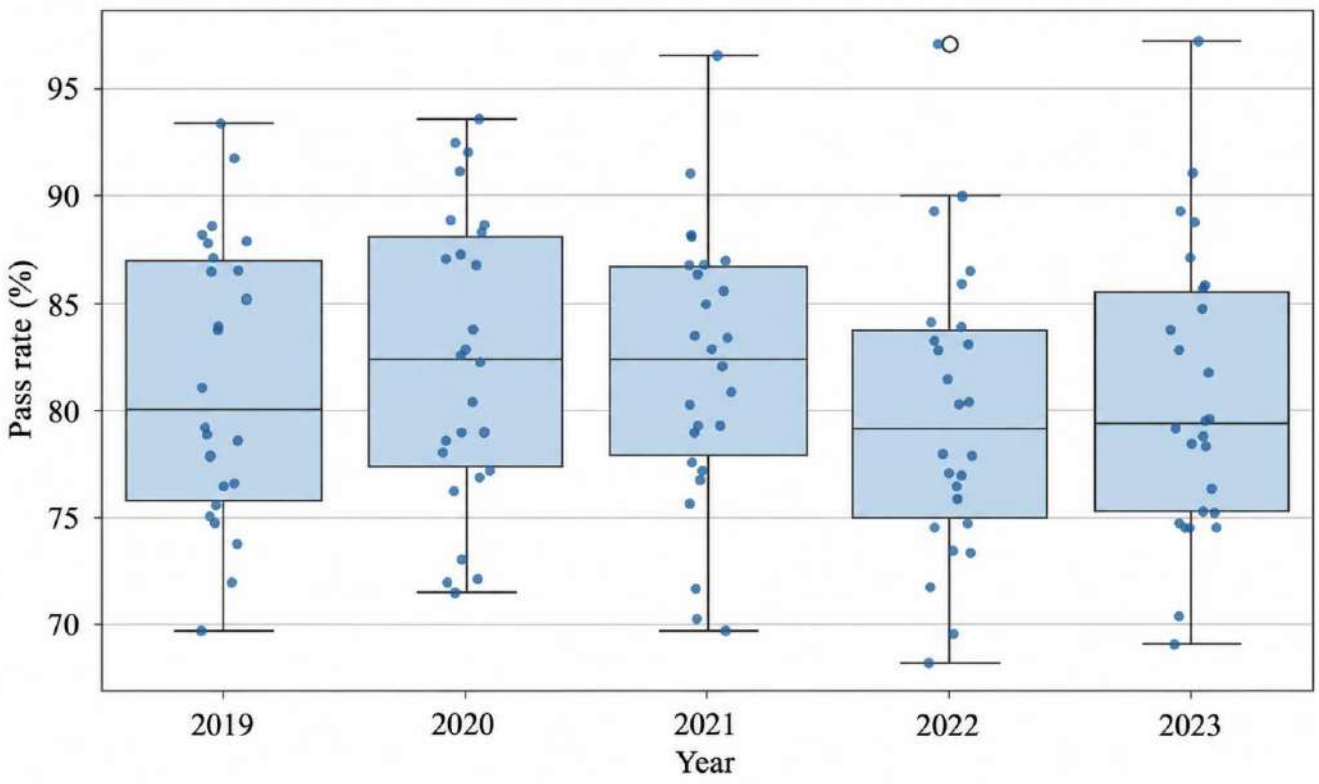


Figure 1
Annual Distribution of Regional Pass Rates across Tanzania Regions

The Lorenz curves in Figure 2 provide complementary evidence of distributional inequality by comparing the cumulative share of regional pass rates with the line of equality. Their departures from that line indicate differences in the distribution across regions. Considered alongside the Gini and other descriptive measures, the curves demonstrate that regional achievement was not evenly distributed. These indicators describe the distribution of observed outcomes; they do not, by themselves, establish inequality in educational opportunities.

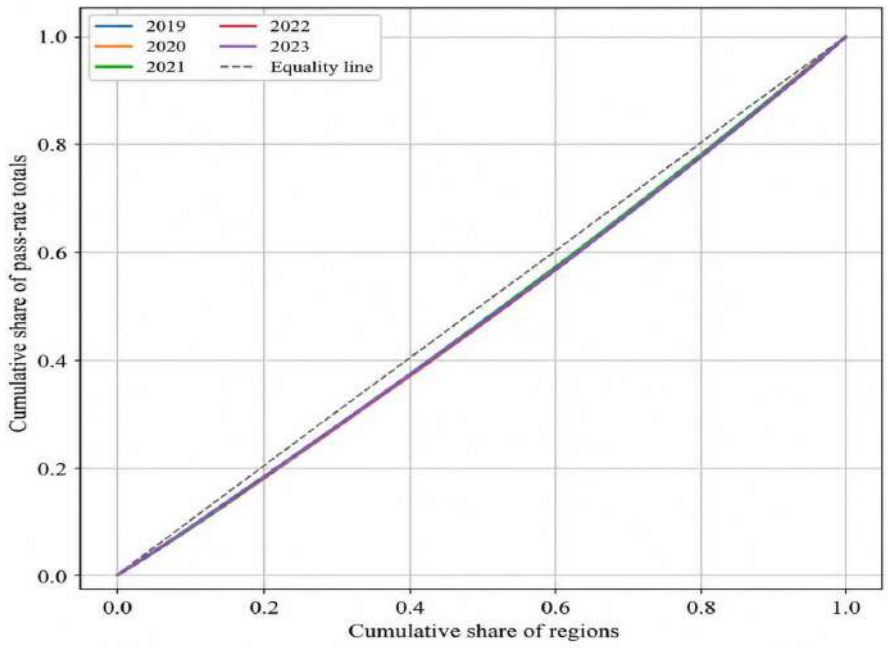


Figure 2
Lorenz Curves for Regional Pass-Rate Distribution, 2019-2023

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The 2023 regional findings illustrate the magnitude of these differences. Dar es Salaam recorded the highest pass rate at 97.16%, whereas Ruvuma recorded the lowest at 69.06%, producing a gap of 28.10 percentage points. Other regions with comparatively low pass rates included Shinyanga (70.31%), Kagera (74.45%), Songwe (74.47%) and Tabora (74.47%). As Figure 3 illustrates, regional rankings identify relative positions but do not fully characterise the distribution or explain why differences occur. The results therefore answer RQ1 by demonstrating that geographical inequality was evident in the regional distribution of PSLE achievement, even when national-level performance appeared relatively stable.

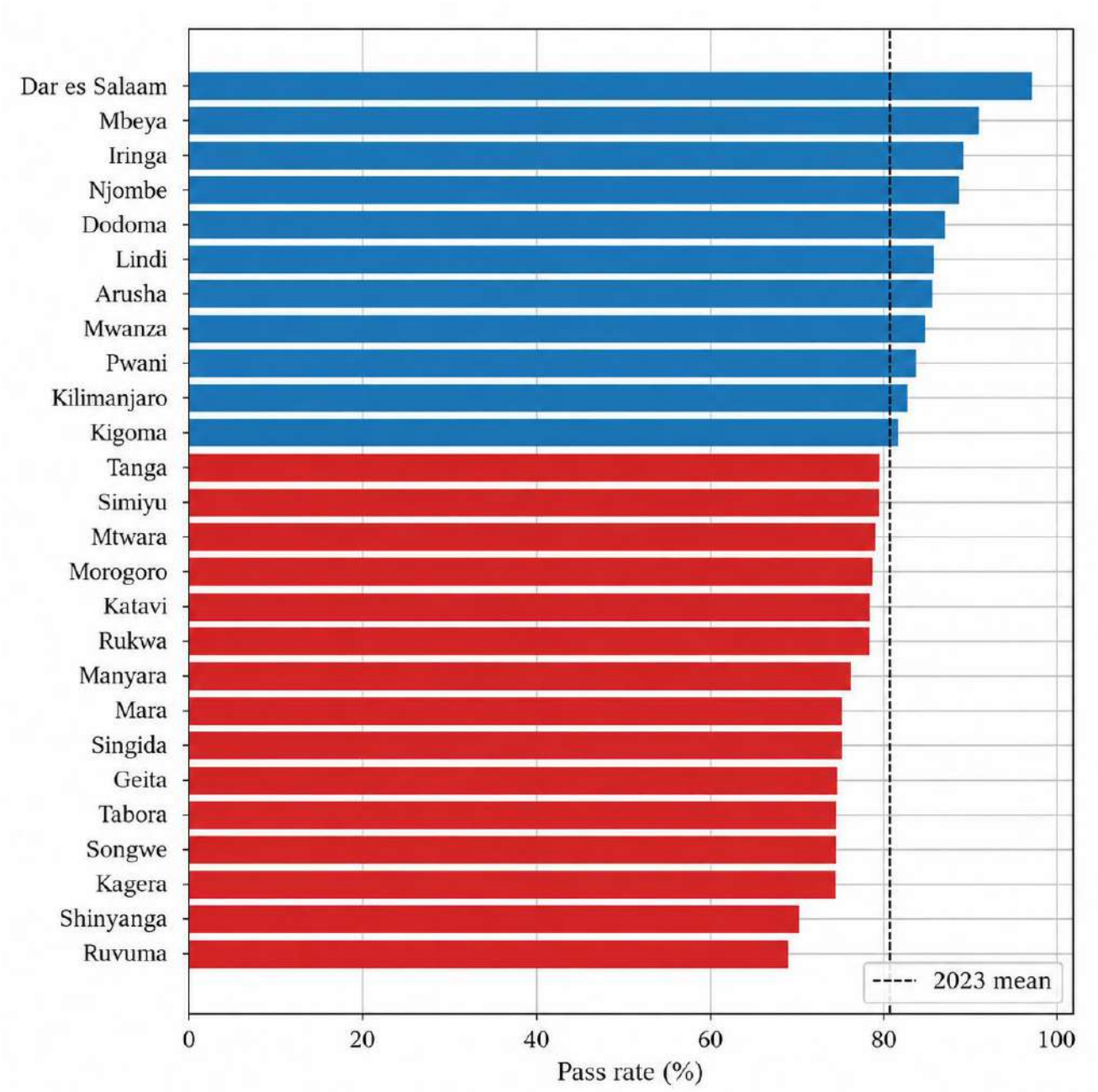


Figure 3

Regional Pass Rates Ranked in 2023, With Regions Below and Above the Annual Mean Distinguished

4.1.2 Changes in Geographical Inequality and Implications for Equity Monitoring

The second objective examined whether geographical inequality narrowed, widened or remained stable between 2019 and 2023. Descriptively, the mean pass rate declined by 0.73 percentage points, while the range increased by 4.50 percentage points. The coefficient of variation increased by 0.36 percentage points, and the Gini coefficient rose by 0.001. However, linear trend tests did not identify statistically significant trends in the principal inequality measures at the 5% significance level. Table 2 presents the estimated annual slopes and associated significance tests

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Table 2

Linear Trend Tests for Annual Pass Rate, Variation and Inequality Measures

Metric	Annual slope	R squared	p value
Mean	-0.3990	0.387	0.263
Range	1.5800	0.723	0.068
IQR	-0.3785	0.278	0.362
CV percent	0.0873	0.276	0.363
Gini	0.0002	0.047	0.727
Theil T	0.0001	0.240	0.402
P90 P10 gap	-0.2900	0.051	0.714

The estimated annual slope for the range was positive at 1.58 percentage points (p = .068). Although this suggests increasing separation between the highest- and lowest-performing regions, the evidence does not meet the conventional 5% significance threshold. The coefficient of variation also had a positive slope of 0.087 percentage points per year (p = .363), while the Gini coefficient had a slope of 0.0002 (p = .727). The interquartile range and P90–P10 gap showed negative slopes, but neither trend was statistically significant. Taken together, these findings do not establish a statistically significant linear increase or decrease in geographical inequality. Nevertheless, the endpoint comparisons indicate that some indicators of dispersion were higher in 2023 than in 2019. Accordingly, the findings support a conclusion of no statistically significant linear trend, alongside descriptive evidence of persistent regional inequality, rather than proof that inequality remained unchanged.

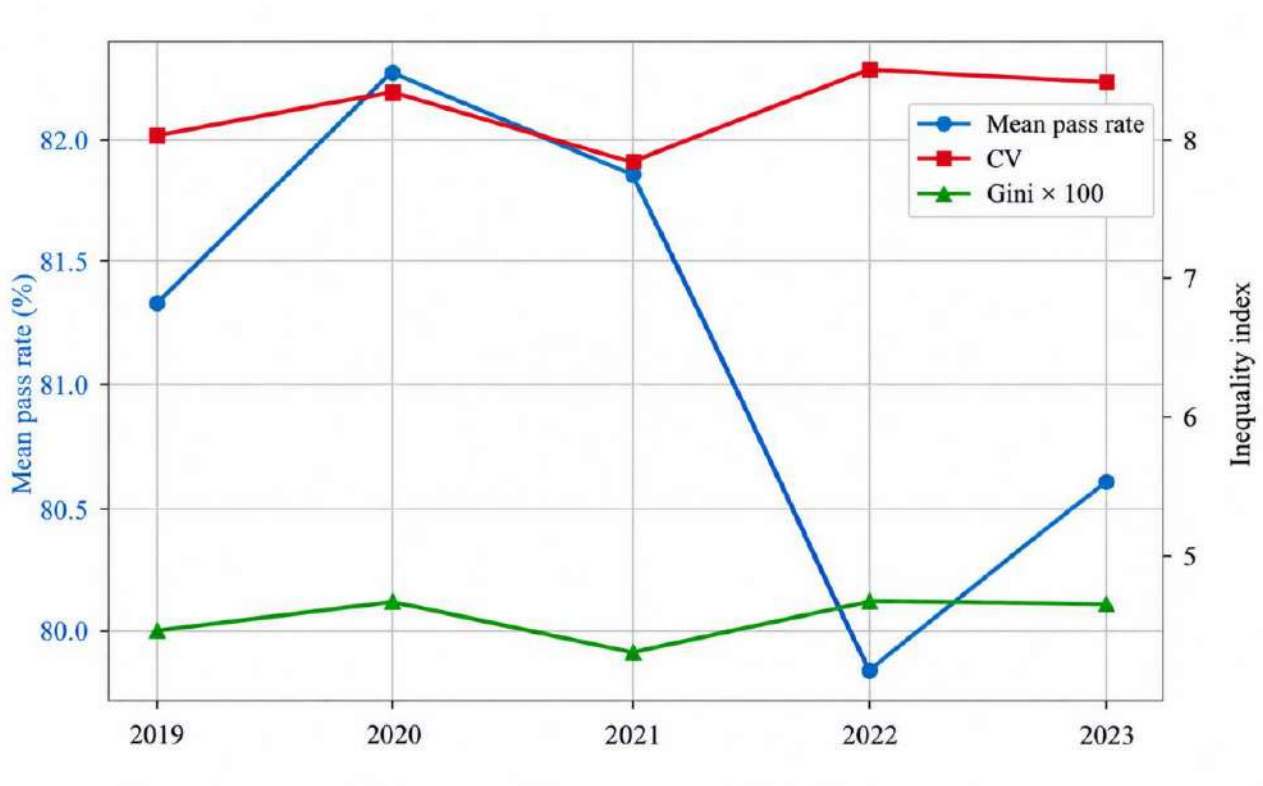


Figure 4

Trends in mean regional pass rates and inequality indices, 2019-2023

Aggregate trends also concealed substantial changes in individual regional performance. As shown in Table 3, Dodoma's pass rate increased by 12.33 percentage points between 2019 and 2023, whereas Ruvuma's declined by 14.64 percentage points. Kagera also recorded a substantial decline of 13.65 percentage points. These contrasting trajectories demonstrate that regional performance could change considerably even when aggregate inequality measures showed no statistically significant linear trend. However, changes in pass rates alone do not establish changes in regions' relative rankings unless their positions are compared directly across years.

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Table 3

Highest and lowest regional pass rates in 2023 with change from 2019

Region	2023 pass rate	Change since 2019	Position
Dar es Salaam	97.16	3.86	Top 2023
Mbeya	90.98	3.98	Top 2023
Iringa	89.21	0.71	Top 2023
Njombe	88.71	2.31	Top 2023
Dodoma	87.03	12.33	Top 2023
Ruvuma	69.06	-14.64	Bottom 2023
Shinyanga	70.31	-7.49	Bottom 2023
Kagera	74.45	-13.65	Bottom 2023
Songwe	74.47	-1.03	Bottom 2023
Tabora	74.47	0.77	Bottom 2023

These findings have two implications for educational equity monitoring. First, average pass rates provide information about overall achievement but cannot independently establish whether geographical disparities are narrowing or widening. Second, rankings identify relative performance positions but do not measure the magnitude or temporal evolution of differences. Combining averages and rankings with distribution-sensitive indicators and region-level trajectories therefore provides a more comprehensive account of geographical inequality. The results answer RQ2 by showing that the study period did not exhibit statistically significant linear trends in the principal inequality measures, despite persistent disparities and substantial changes in some regions' pass rates.

4.2 Discussion

4.2.1 Geographical Inequality in PSLE Achievement

The findings demonstrate that geographical inequality in PSLE achievement persisted across Mainland Tanzania between 2019 and 2023, despite relatively high average pass rates. The mean declined slightly from 81.30% to 80.57%, while the regional range increased from 23.60 to 28.10 percentage points. This divergence indicates that average achievement alone provides an incomplete account of how examination outcomes are distributed across regions. The finding is consistent with Graetz et al. (2018), who demonstrated substantial subnational variation in educational attainment across Africa, and Sumida and Kawata (2021), who identified persistent urban–rural learning gaps across sub-Saharan African education systems. However, these studies examined educational attainment and urban–rural differences, respectively, rather than the longitudinal distribution of regional examination pass rates. The present study extends this evidence by quantifying differences across all 26 Mainland regions over five consecutive years.

The findings also extend Kassile's (2014) analysis of regional PSLE disparities in Tanzania. Using multilevel analysis, Kassile investigated associations between regional pass rates, educational resources and parental education, finding that women's educational attainment was positively associated with pass rates, whereas several resource indicators were not statistically significant. The present study addresses a complementary question: rather than primarily examining factors associated with regional differences, it assesses the magnitude and distribution of those differences over time. The increase in the range and coefficient of variation between 2019 and 2023 indicates that some dimensions of regional dispersion increased descriptively, although the overall trend tests did not establish statistically significant change. Taken together, the studies demonstrate the value of distinguishing the existence, magnitude and potential correlates of geographical inequality.

4.2.2 Temporal Patterns: Persistent Inequality and Regional Mobility

The second major finding is that none of the principal inequality measures showed a statistically significant linear trend during 2019–2023. Nevertheless, the range, coefficient of variation and Gini coefficient were slightly higher in 2023 than in 2019. This combination suggests persistent geographical disparities without sufficient statistical evidence to conclude that inequality systematically widened or narrowed. The result should not be interpreted as proof that the distribution remained unchanged, particularly because the trend analysis relied on only five annual observations.

This finding contrasts in an important respect with Maliti's (2019) analysis of educational inequality in Tanzania over 1991–2015, which found declining inequality in educational attainment between rural and urban populations and between Dar es Salaam and other regions. However, the two studies measure different outcomes over different periods. Maliti examined attainment using repeated household surveys, whereas the present study examines annual regional PSLE pass rates. The findings are therefore not necessarily contradictory: inequalities in years of education may decline while disparities in examination achievement follow a different trajectory. The comparison highlights the importance of specifying the educational outcome and geographical unit when assessing changes in inequality.

Furthermore, the substantial changes in individual regional pass rates reveal that aggregate distributional patterns can conceal regional mobility. Dodoma's pass rate increased by 12.33 percentage points, whereas Ruvuma's

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declined by 14.64 percentage points between 2019 and 2023. These contrasting trajectories show that the absence of a statistically significant trend in aggregate inequality does not imply that regional performance remained constant. This distinction extends the longitudinal perspective in Maliti (2019) by demonstrating the analytical value of examining examination outcomes alongside aggregate inequality measures. However, changes in pass rates should not automatically be interpreted as changes in relative rankings or educational opportunity without further analysis.

4.3 Implications for Educational Equity Monitoring

The results challenge the sufficiency of average achievement and regional rankings as indicators of geographical equity. Although the mean pass rate remained around 80%, the 2023 gap between Dar es Salaam and Ruvuma was 28.10 percentage points. An average summarises central performance, while a ranking establishes relative position; neither independently quantifies the overall distribution of achievement. Ferreira and Gignoux (2014) similarly distinguish average educational achievement from inequality, demonstrating the importance of treating these as separate analytical dimensions. The present findings extend this principle to regional PSLE monitoring by showing that apparently stable average performance can coexist with substantial geographical differences.

Educational authorities should therefore complement averages and rankings with distribution-sensitive indicators, including the coefficient of variation, Gini coefficient, interquartile range and P90–P10 gap. These indicators provide complementary evidence about relative dispersion and differences across the achievement distribution. Regional trajectories should also be monitored because changes in individual regions may remain obscured by aggregate trends. Such an approach would help identify persistent or emerging disparities that warrant further investigation. Nevertheless, distributional indicators should be interpreted as measures of differences in observed outcomes, not as direct proof of unequal educational opportunities or evidence that particular policies caused the observed patterns.

4.4 Contribution to African Education Research

This study contributes to African education research by extending the analysis of geographical inequality from documenting regional differences to examining their magnitude and temporal behaviour. Whereas Graetz et al. (2018) mapped spatial variation in educational attainment and Kassile (2014) investigated regional PSLE differences and associated factors, the present study combines multiple inequality measures with longitudinal comparisons of examination performance. It also complements Maliti's (2019) analysis by distinguishing changes in educational attainment inequality from changes in examination achievement inequality. These differences in outcome measurement and analytical approach clarify the specific contribution of the study rather than suggesting that the findings replace earlier evidence.

The contribution of this study is primarily methodological and empirical. It demonstrates how routinely reported regional examination data can be used to assess distributional inequality and distinguish aggregate trends from changes in individual regions. However, regional pass rates cannot explain why geographical differences persist. Further research should link examination outcomes to school-level resources, teacher deployment, socioeconomic conditions and differences between districts and schools. Such analysis would help establish whether the observed disparities reflect differences in educational provision, contextual circumstances or other mechanisms. The present findings therefore provide a basis for more distribution-sensitive monitoring while identifying the need for further explanatory research.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

This study examined geographical inequality in Primary School Leaving Examination (PSLE) achievement across 26 regions of Mainland Tanzania between 2019 and 2023. The findings demonstrate that relatively stable average performance coexisted with substantial differences between higher- and lower-performing regions. Although some inequality measures increased descriptively, none of the principal measures exhibited a statistically significant linear trend. The evidence therefore does not establish systematic regional convergence or divergence, indicating that geographical disparities persisted without a statistically demonstrable overall trend towards greater or lesser inequality during the study period. These findings highlight the limitations of relying exclusively on average pass rates and regional rankings to monitor educational equity. Although averages summarise overall performance and rankings indicate relative regional positions, neither adequately captures the magnitude and temporal patterns of geographical inequality. Complementary distribution-sensitive measures are therefore necessary to provide a more comprehensive assessment of educational disparities. However, the study identifies patterns in regional examination outcomes rather than their underlying causes. Furthermore, regional aggregates may conceal inequalities within regions associated with gender, locality, disability and socioeconomic circumstances. Understanding these mechanisms requires further investigation using more disaggregated data.

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5.2 Recommendations

First, educational authorities should complement regional rankings and average pass rates with distribution-sensitive indicators, including the coefficient of variation, Gini coefficient, Theil index and P90–P10 gap. Reporting these measures alongside conventional performance indicators would provide a clearer assessment of the magnitude and distribution of geographical inequality. Second, educational equity monitoring should adopt a longitudinal approach. Comparing regional outcomes across successive examination cycles would help distinguish temporary fluctuations from persistent patterns and establish whether geographical disparities are narrowing, widening or remaining relatively stable. Third, regions exhibiting persistent or substantial differences should be prioritised for further investigation using evidence on teacher deployment, school resources, infrastructure, district characteristics and household socioeconomic conditions. Linking these factors with longitudinal examination data would help identify the mechanisms associated with geographical disparities without assuming that regional pass-rate differences alone explain their causes.

Finally, future research and monitoring systems should examine inequalities within regions as well as between them. Where data are available, achievement should be disaggregated by gender, locality, disability and socioeconomic circumstances, and analysed at school and district levels. This would help establish whether apparently similar regional averages conceal substantial inequalities among schools and population groups, thereby providing a more comprehensive basis for assessing educational equity

Declaration of Interest

The authors declare that they do not have any known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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