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Regional Educational Disparities in Indonesia: Evidence from Average Years of Schooling Statistics (2025)

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Abstract: Education is a fundamental driver of human capital accumulation and inclusive socioeconomic development, yet spatial inequalities in educational attainment remain a persistent structural challenge across developing archipelagic nations. This study examines inter-provincial educational disparities across Indonesia's 38 provinces using Average Years of Schooling (AYS) data from Education Statistics 2025 published by Statistics Indonesia (BPS). Employing a descriptive comparative quantitative design, the analysis evaluates provincial rankings, benchmark deviations against the national mean, and center–periphery attainment gaps. The results reveal pronounced spatial inequality: DKI Jakarta records the highest AYS at 11.58 years, whereas Papua Pegunungan records the lowest at 4.76 years, yielding a national attainment gap of 6.82 years around the national benchmark of 9.41 years. Notably, several non-Java provinces including Kepulauan Riau (10.78), Papua (10.65), Maluku (10.63), and Papua Barat Daya (10.60) outperform the national average, demonstrating that regional development trajectories are not strictly bound by a Java–outer-island dichotomy. The study concludes that reducing spatial educational inequality requires place-based fiscal allocation, targeted infrastructure investment, and differentiated regional governance strategies.

Keywords: Educational Disparities; Average Years of Schooling; Human Capital; Educational Equity; Regional Development

1. Introduction

Education is widely recognized in endogenous growth and human capital theory as a foundational determinant of economic productivity, social mobility, and sustainable socioeconomic progress [1]–[4]. A well-educated population strengthens national capacity for innovation, technological absorption, and institutional resilience in an increasingly knowledge-driven global economy [1], [5], [6]. Beyond enhancing individual labor market returns and household welfare, equitable educational expansion expands human capabilities and reduces structural poverty [3], [4]. Consequently, national governments and international development agencies prioritize educational attainment as a core strategic investment for long-term prosperity and social cohesion [2], [7], [8].

In Indonesia, human capital formation occupies a central pillar in the National Long-Term Development Plan (RPJPN 2025–2045) and Medium-Term Development Plan (RPJMN 2025–2029) toward realizing the vision of Indonesia Emas 2045 [9], [10]. Over recent decades, the Indonesian government has enacted comprehensive policy reforms including the 12-year compulsory education agenda, Kurikulum Merdeka, conditional cash transfers via the Smart Indonesia Program (Program Indonesia Pintar), teacher professional certification, and digital learning integration to broaden access and improve learning quality [9], [11]–[13]. While these sustained interventions have substantially raised national literacy and school enrollment rates [14]–[16], translating aggregate expansion into spatially equitable attainment remains a formidable governance challenge across Indonesia's vast archipelagic geography [10], [15], [17].

Despite aggregate national gains, educational development remains markedly uneven across Indonesia's 38 provinces [14], [15], [17]. Persistent disparities endure in school infrastructure, qualified teacher deployment, household socioeconomic capacity, and transition rates to upper secondary and tertiary education [6], [17], [18].

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Provinces endowed with stronger fiscal capacity, urban agglomeration, and institutional density consistently outperform geographically isolated or newly established provinces facing severe connectivity and resource constraints [4], [17], [18]. Left unaddressed, spatial inequalities in educational attainment risk entrenching intergenerational poverty and regional economic divergence [1], [3], [19].

A standard metric for evaluating cumulative population-level educational attainment is Average Years of Schooling (AYS), defined as the mean number of years of formal education completed by residents aged 15 years and above [2], [15]. As a core educational component of the Human Development Index (HDI), AYS captures the stock of human capital accumulated within a region rather than transient enrollment flows [2], [4], [15]. According to Education Statistics 2025 (Statistik Pendidikan 2025) published by Statistics Indonesia (Badan Pusat Statistik [BPS]), Indonesia's national AYS reached 9.41 years in 2025 roughly equivalent to completing lower secondary education [14]. However, this national aggregate conceals substantial inter-provincial dispersion, with several provinces approaching full upper secondary completion while others lag at primary-school levels [14], [15].

Although prior scholarship has examined Indonesian educational reforms, learning quality, and national enrollment trends [11], [12], [17], fewer studies provide an updated empirical mapping of provincial AYS disparities incorporating Indonesia's expanded administrative structure of 38 provinces including newly formed autonomous provinces in Papua [14], [15]. Evaluating the post-reorganization spatial distribution of AYS is critical for informing targeted fiscal transfers and differentiated regional education policies [9], [10], [20]. Therefore, this study investigates regional educational disparities in Indonesia using 2025 provincial AYS statistics. Specifically, the study addresses three objectives: (1) to analyze the provincial distribution and ranking of educational attainment across all 38 provinces; (2) to quantify the magnitude of inter-provincial educational inequality relative to the national benchmark; and (3) to formulate evidence-based policy and governance recommendations for advancing spatial educational equity and inclusive human capital development.

2. Methodology

2.1. Research Design

This study employed a descriptive comparative quantitative design utilizing official secondary statistical data from Education Statistics 2025 published by Statistics Indonesia (BPS) [14]. A descriptive comparative approach is epistemologically appropriate when the primary objective is to systematically map spatial distributions, benchmark institutional performance, and quantify structural inequality across administrative jurisdictions rather than estimate causal regression parameters [6], [8]. By evaluating provincial variations in Average Years of Schooling (AYS), this design establishes an empirical baseline for diagnosing regional human capital gaps and informing place-based educational planning [2], [9], [10].

2.2. Data Source and Variables

The primary dataset was extracted from Table 5.21 of Education Statistics 2025 (Statistik Pendidikan 2025), which reports official Average Years of Schooling (AYS) estimates for the population aged 15 years and above across all 38 Indonesian provinces [14]. Unlike gross or net enrollment ratios that reflect current school participation flows, AYS measures the cumulative stock of formal schooling attained by the adult and working-age population, making it a robust indicator of long-term regional human capital development [1]–[3], [15].

The analysis examined total provincial AYS values (measured in years) across all 38 provinces comprising 34 established provinces and four newly established provinces in Papua (Papua Selatan, Papua Tengah, Papua Pegunungan, and Papua Barat Daya) to ensure comprehensive national coverage [14]. The official national AYS benchmark of 9.41 years served as the reference threshold for classifying provinces into above-average and below-average attainment tiers [14]. Relying on standardized, nationally audited BPS survey estimates ensures high data reliability, cross-provincial comparability, and methodological reproducibility [14], [15].

2.3. Analytical Procedure

Data analysis proceeded through a structured four-stage comparative protocol [6], [8], [20]. First, provincial AYS records were extracted, cross-verified against BPS metadata, and compiled into a unified national dataset covering all 38 provinces [14]. Second, provinces were ranked in descending order of AYS to identify top-performing and lagging jurisdictions [1], [2]. Third, dispersion and inequality metrics were computed specifically the absolute range gap (highest minus lowest provincial AYS), the attainment ratio (highest-to-lowest provincial AYS), and absolute deviations from the 9.41-year national benchmark to quantify the magnitude of spatial inequality [14], [20]. Fourth, spatial patterns were synthesized across Java and outer-island regions to interpret institutional, geographic, and policy drivers of attainment divergence and derive targeted governance

recommendations [9], [10], [17].

3. Results and Discussion

The empirical analysis of 2025 Average Years of Schooling (AYS) data across Indonesia's 38 provinces demonstrates substantial spatial heterogeneity in educational attainment [14]. While the national benchmark of 9.41 years indicates that the average Indonesian aged 15 years and older has completed lower secondary education (Grade 9), provincial outcomes diverge markedly across urban centers, outer-island hubs, and remote highland territories [14], [15].

3.1. Top-Performing Provinces in Educational Attainment

Provincial ranking analysis reveals that ten provinces achieved AYS values exceeding 10.00 years in 2025, signifying an average population attainment approaching upper secondary completion (Grade 11–12) [14]. Table 1 summarizes the ten highest-performing provinces nationally.

Table 1. Top Ten Indonesian Provinces by Average Years of Schooling (2025)

Rank	Province	Region/Island Group	AYS (Years)	Deviation vs. National (9.41)
1	DKI Jakarta	Java	11.58	+2.17
2	Kepulauan Riau	Sumatra	10.78	+1.37
3	Papua	Papua	10.65	+1.24
4	Maluku	Maluku	10.63	+1.22
5	Papua Barat Daya	Papua	10.60	+1.19
6	DI Yogyakarta	Java	10.58	+1.17
7	Aceh	Sumatra	10.42	+1.01
8	Sulawesi Utara	Sulawesi	10.10	+0.69
9	Bali	Nusa Tenggara & Bali	10.07	+0.66
10	Sumatera Barat	Sumatra	10.03	+0.62

As shown in Table 1, DKI Jakarta leads the nation with an AYS of 11.58 years (+2.17 years above the national benchmark), reflecting dense educational infrastructure, high urban household income, and strong labor market incentives for upper secondary and tertiary credentials [14], [15], [18]. Crucially, eight of the top ten provinces are located outside Java specifically Kepulauan Riau (10.78), Papua (10.65), Maluku (10.63), Papua Barat Daya (10.60), Aceh (10.42), Sulawesi Utara (10.10), Bali (10.07), and Sumatera Barat (10.03) [14]. This pattern demonstrates that high educational attainment is not restricted to Java's economic core, but also emerges in outer-island provinces characterized by coastal urban centers, administrative hubs, and sustained public education investments [1], [4], [17].

3.2. Lagging Provinces and Spatial Disparities

Conversely, several provinces remain substantially below the national benchmark of 9.41 years, indicating widespread non-completion of basic and lower secondary education [14], [17]. Table 2 presents the five provinces with the lowest AYS values in 2025.

Table 2. Five Indonesian Provinces with the Lowest Average Years of Schooling (2025)

Rank (Lowest)	Province	Region/Island Group	AYS (Years)	Deviation vs. National (9.41)
38 (1st Lowest)	Papua Pegunungan	Papua	4.76	-4.65
37 (2nd Lowest)	Papua Tengah	Papua	6.27	-3.14
36 (3rd Lowest)	Kalimantan Barat	Kalimantan	8.54	-0.87
35 (4th Lowest)	Jawa Tengah	Java	8.62	-0.79
34 (5th Lowest)	Gorontalo	Sulawesi	8.78	-0.63

The data in Table 2 highlight acute educational deprivation in Indonesia's central highland provinces [14]. Papua Pegunungan records the lowest AYS at 4.76 years (-4.65 years below the national mean), equivalent to less than five years of primary schooling, followed by Papua Tengah at 6.27 years (-3.14 years) [14]. Notably,

Jawa Tengah (8.62 years) also appears among the five lowest-ranking provinces despite its location on Java Island, largely due to its large rural demographic base and older cohort age structure [14], [15]. Meanwhile, Kalimantan Barat (8.54 years) and Gorontalo (8.78 years) reflect persistent challenges in rural school transition and dispersed settlement connectivity [17], [18].

3.3. Intra-Regional Divergence and Magnitude of Educational Inequality

A critical structural insight from the 2025 statistics is the pronounced intra-regional divergence within eastern Indonesia particularly across the newly reorganized provinces of Papua [14]. While coastal and administrative-hub provinces such as Papua (10.65 years) and Papua Barat Daya (10.60 years) rank among the top five nationally, newly carved highland provinces such as Papua Pegunungan (4.76 years) and Papua Tengah (6.27 years) occupy the bottom two positions [14]. This 5.89-year gap within the same macro-region underscores that aggregate island-level generalizations mask severe sub-regional inequalities driven by rugged mountainous topography, sparse road networks, localized security disruptions, and acute shortages of qualified secondary teachers [17], [18], [20].

To evaluate the overall scale of national educational inequality, Table 3 and Figure 1 synthesize the extreme bounds, national benchmark, dispersion metrics, and regional comparisons across Indonesia.

Table 3. Summary Metrics of National Educational Attainment Inequality in Indonesia (2025)

Inequality Indicator	Reference Province/Benchmark	Value	Educational Equivalence/Interpretation
Highest Provincial AYS	DKI Jakarta	11.58 years	Nearly completed upper secondary (Grade 12)
National Benchmark AYS	Indonesia (38 Provinces)	9.41 years	Completed lower secondary education (Grade 9)
Lowest Provincial AYS	Papua Pegunungan	4.76 years	Incomplete primary education (Grade 5)
Absolute Range Gap	DKI Jakarta vs. Papua Pegunungan	6.82 years	More than two full schooling levels apart
Attainment Ratio	Highest-to-Lowest Ratio	2.43 : 1	Jakarta attainment is 2.43x Papua Pegunungan

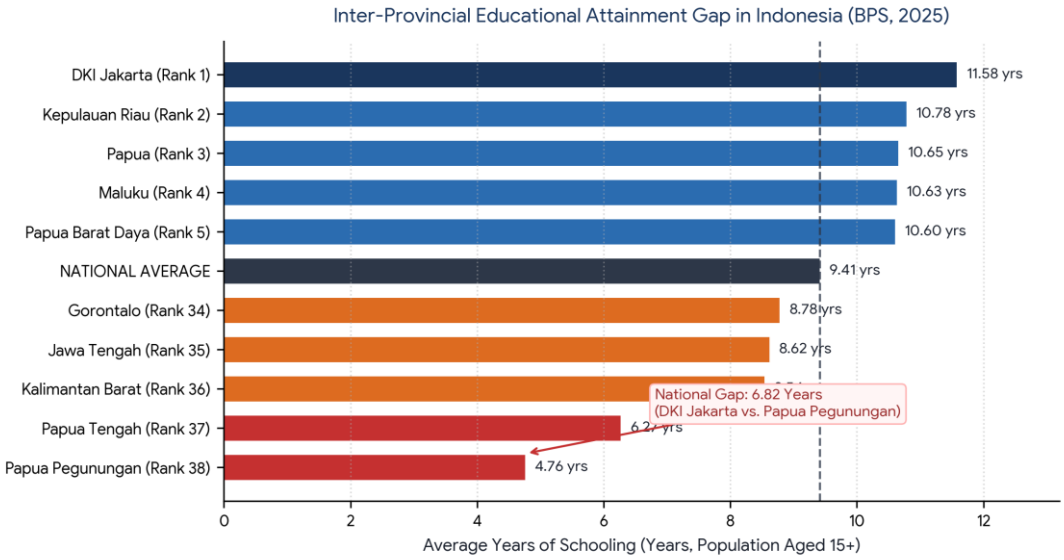

Figure 1. Comparison of top-performing, lagging, and national benchmark Average Years of Schooling across Indonesian provinces in 2025 (Source: Processed from BPS [14]).

As quantified in Table 3 and illustrated in Figure 1, the absolute attainment gap of 6.82 years (an attainment ratio of 2.43:1) represents a structural divide exceeding two full levels of formal schooling [14]. While residents in DKI Jakarta possess nearly complete upper secondary education, adults in Papua Pegunungan average fewer than five years of primary schooling. Consistent with human capital and capability frameworks [1], [3], [4], such

severe educational asymmetry constrains regional labor productivity, limits formal sector employability, and reinforces spatial income inequality.

3.4. Policy Implications, Research Contributions, and Limitations

The empirical findings yield several strategic policy implications for educational governance in Indonesia [9], [10]. First, uniform nationwide allocation formulas are insufficient to close a 6.82-year attainment gap; fiscal transfers such as Special Allocation Funds for Education (DAK Fisik/Non-Fisik) and Special Autonomy (Otsus) education budgets must incorporate spatial deprivation weighting prioritizing provinces below the 9.41-year national threshold [10], [13], [17]. Second, addressing acute deficits in Papua Pegunungan and Papua Tengah requires integrated place-based interventions combining boarding-school models, contextualized Kurikulum Merdeka delivery, localized teacher recruitment with hardship incentives, and solar-powered digital connectivity [11], [17], [18]. Third, in populous provinces with lower AYS driven by older demographic cohorts such as Jawa Tengah, adult equivalency programs (Pendidikan Kesetaraan Paket B and C) alongside upper secondary scholarship expansion via Program Indonesia Pintar are essential to accelerate cohort transition [12], [13].

From a scholarly standpoint, this study contributes updated empirical evidence on spatial educational inequality following Indonesia's 2022–2024 provincial reorganization into 38 provinces, demonstrating that educational disparities cut across intra-regional lines rather than following a simplistic Java–outer-island binary [14], [15]. Nevertheless, three methodological limitations should be noted: (1) AYS measures years of schooling quantity rather than cognitive learning quality or foundational literacy/numeracy outcomes [6], [20]; (2) provincial aggregates conceal intra-provincial urban–rural and district-level (kabupaten/kota) disparities [14]; and (3) the cross-sectional descriptive design does not estimate causal elasticities of fiscal or infrastructural inputs. Future research should integrate multi-year panel data, district-level spatial econometrics, and learning assessment metrics to evaluate the longitudinal impact of targeted equity interventions [6], [8], [20].

4. Conclusion

This study analyzed regional educational disparities across Indonesia's 38 provinces using Average Years of Schooling (AYS) data from Education Statistics 2025 [14]. While Indonesia achieved a national average of 9.41 years, substantial spatial inequality persists between top-performing urban and coastal provinces led by DKI Jakarta (11.58 years), Kepulauan Riau (10.78 years), and Papua (10.65 years) and lagging highland provinces such as Papua Pegunungan (4.76 years) and Papua Tengah (6.27 years). The resulting 6.82-year attainment gap highlights a profound structural divide in human capital accumulation that cannot be resolved through uniform national policies alone.

Advancing educational equity in alignment with Indonesia Emas 2045 requires differentiated, place-based governance strategies that pair deprivation-weighted fiscal transfers with targeted school infrastructure, teacher deployment incentives, and non-formal equivalency pathways in lagging regions [9], [10], [17]. Future longitudinal and district-level empirical investigations combining AYS with learning quality indicators are recommended to monitor convergence trajectories and strengthen evidence-based educational policymaking.

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