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Brief Report: Invisible at Birth: State Administrative Capacity, Subnational Development Inequality, and Civil Registration Completeness — Cross-National Evidence from 165 Countries

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Short Report

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Abstract

This Brief Report examines whether state administrative capacity and within-country development inequality predict birth registration completeness across a cross-national sample of 165 countries. We conducted a cross-sectional observational study merging three publicly available datasets: the UNICEF Birth Registration Database (May 2025), the World Bank Worldwide Governance Indicators (WGI; 1996–2024), and the Global Data Lab Subnational Human Development Index Database (GDL; 2023). A composite governance quality index was constructed from six WGI dimensions by normalising and averaging underlying source scores across 35 data providers. We estimated ordinary least squares regression models with logit-transformed birth registration rates as the outcome across four progressively controlled specifications with region fixed effects. Governance quality was positively correlated with registration ($r = .47$, $p < .001$) and significantly predicted registration after income and region adjustment ($\beta = 0.42$, $SE = 0.17$, $p = .013$; $R^2 = .740$). Control of corruption was the most significant WGI subcomponent ($\beta = 0.42$, $SE = 0.20$, $p = .038$). Subnational HDI inequality was negatively correlated with registration ($r = -.62$, $p < .001$). These findings suggest civil registration completeness is partly a governance outcome and that anti-corruption interventions within civil registration systems represent a specific, actionable reform entry point.

Introduction and Background

Among the quietest failures of the modern state is its inability to record the births of its own citizens. A birth certificate is the document through which a person acquires legal identity — enabling access to public education, health services, social protection, and political participation. Without one, a child exists physically yet remains invisible to every administrative system designed to serve them. UNICEF estimates approximately 166 million children under five currently lack a registered birth, predominantly in low- and middle-income countries (UNICEF, 2025). The problem is not explained by poverty alone: among countries at comparable income levels, birth registration rates diverge by 40 to 60 percentage points.

A substantial literature has established household-level predictors — maternal education, household wealth, urban residence, and health-facility delivery are consistently associated with registration (Aboagye et al., 2023; Ebbers & Smits, 2022; Victora et al., 2016). Yet Ebbers and Smits (2022) found that 29% of variance in registration across Sub-Saharan Africa is attributable to country-level rather than household-level factors, and called explicitly for research on institutional predictors. The supply side — the administrative reach and integrity of the state — remains underexamined in cross-national research.

Drawing on state capacity theory (Evans et al., 1985; Scott, 1998), we argue that governance quality and within-country development inequality are independent predictors of national birth registration completeness. Civil registration depends on administrative capacity: functioning offices, trained registrars, and reliable data systems. Corruption within civil registration systems further excludes the poorest households through informal fees. Within-country development inequality — the gap between well-served urban centres and underserved peripheries — compounds these gaps spatially. No prior cross-national

study has jointly tested a composite WGI measure and subnational inequality as predictors of registration in a sample spanning all world regions and income groups.

Data and Methods

Sources and Sample

Birth registration completeness — the percentage of children under five with a registered birth — was drawn from the UNICEF Birth Registration Database (May 2025; UNICEF, 2025). UNICEF compiles this indicator from Demographic and Health Surveys (DHS) and Multiple Indicator Cluster Surveys (MICS), nationally representative household surveys conducted by national statistical offices with UNICEF and ICF International technical support, as well as from national civil vital statistics where available. Both instruments ask directly whether a child's birth has been registered with civil authorities (DHS: 'Has [child's] birth been registered?'; MICS uses an equivalent item). Estimates reflect the most recent survey per country (approximately 2010–2023). Cross-country comparability is ensured through UNICEF's harmonisation protocol applying consistent case definitions and age-range restrictions (children 0–59 months).

Governance quality data were downloaded as raw data files from the World Bank Worldwide Governance Indicators database (1996–2024 edition; Kaufmann et al., 2011; https://www.govindicators.org). The WGI aggregates assessments from 35 cross-national perception-based sources including household surveys, expert assessments, and commercial risk ratings. For each country, each source's raw scores were normalised to [0, 1] using minimum-maximum scaling and dimension-level averages computed. A composite governance index was then constructed by averaging normalised scores across all six WGI dimensions: government effectiveness (GE; quality of public services and civil service independence), rule of law (RL; contract and property rights enforcement), control of corruption (CC; prevention of private capture of public office), voice and accountability (VA; political freedoms), political stability (PV), and regulatory quality (RQ). The composite ranged 0–1 (higher = better governance) and represents long-run governance profiles averaged over the full 1996–2024 data span. Income group classifications (low, lower middle, upper middle, high income) were drawn from the World Bank's 2023 Atlas method thresholds in the WGI country metadata and coded ordinally 1–4.

Subnational HDI data were obtained from the Global Data Lab Subnational Human Development Database (Smits & Permanyer, 2019; https://globaldatalab.org/shdi/), which provides annual HDI estimates for subnational administrative units from DHS, MICS, and census microdata. We used 2023 national HDI values and computed the standard deviation of subnational province-level HDI scores per country as our measure of within-country development inequality.

Sample Construction and Missing Data

Figure S1 in the Online Supplement presents the full sample construction flow. The UNICEF database contained 238 country records; 40 (16.8%) lacked a valid under-five registration estimate and were

excluded, leaving 198. An inner join of WGI (216 economies) and GDL (188 countries) records yielded 186 matched countries, of which 21 (11.3%) had no matching UNICEF registration data — primarily small island states and dependent territories. The final analytic sample comprised 165 countries. Excluded countries were disproportionately high-income (n = 8, 38.1%) and upper-middle-income (n = 8, 38.1%) small territories with near-complete registration, indicating a missing-not-at-random (MNAR) pattern with respect to income. This introduces a slight conservative bias on the mean registration rate but does not systematically affect the governance–registration association among the 165 included countries. Of the 165 countries, 152 (92.1%) had subnational HDI standard deviation data, used in Models C and D only. Two countries with missing income codes are excluded from all models (effective analytic n = 163).

Measures and Coding

Birth registration completeness (%) was logit-transformed after rescaling to [0.001, 0.999] to normalise the bounded distribution for OLS regression; coefficients represent changes in the log-odds of registration. All continuous predictors were standardised (M = 0, SD = 1). Five regional dummies were included — Sub-Saharan Africa (SSA; n = 44, 26.7%), South Asia (SA; n = 8, 4.8%), Latin America and Caribbean (LAC; n = 26, 15.8%), Middle East and North Africa (MENA; n = 15, 9.1%), East Asia and Pacific (EAP; n = 24, 14.5%) — with Europe and Central Asia (ECA; n = 46, 27.9%) as the reference category. Table 1 presents comprehensive variable descriptives.

Analytic Approach

Four progressively controlled OLS regression models were estimated. Model A: composite governance + income group + region fixed effects. Model B: + national HDI. Model C (full): + subnational HDI SD. Model D: WGI subcomponents (GE, RL, CC) replacing the composite. All six regional dummies are included in every model. Variance inflation factors (max VIF = 6.2) confirmed absence of problematic multicollinearity. A sensitivity analysis restricted the sample to low- and lower-middle-income countries (n = 69). Analyses were conducted in Python 3.12 (statsmodels v0.14, pandas, numpy, scipy; Online Resource 1).

Results

The 165-country sample had a mean birth registration rate of 86.5% (SD = 21.3%, range: 2.7–100.0%). Mean governance quality (WGI composite) was 0.52 (SD = 0.11, range: 0.25–0.83). Mean national HDI was 0.76 (SD = 0.14). Subnational HDI standard deviation averaged 0.041 (SD = 0.026, range: 0.005–0.126; n = 152). Table 1 presents comprehensive descriptive statistics for all variables by income group, including variable labels, measurement scales, coding, and distributional information.

Table 1 *Descriptive Statistics for All Study Variables by Income Group (n = 165)*

Variable	Label / Scale	Coding	Low Inc. M (SD) n = 21	Lower-Mid M (SD) n = 48	Upper-Mid M (SD) n = 44	High Inc. M (SD) n = 50	Overall M (SD) [Range]
Birth registration	% children <5 registered	Continuous (0–100)	59.0 (24.3)	77.7 (21.8)	95.1 (10.8)	99.6 (1.8)	86.5 (21.3) [2.7–100.0]
WGI composite	Governance quality index	Continuous (0–1)	0.39 (0.07)	0.45 (0.07)	0.49 (0.07)	0.63 (0.09)	0.52 (0.11) [0.25–0.83]
Govt. effectiveness	WGI subcomponent (GE)	Continuous (0–1)	0.30 (0.07)	0.38 (0.07)	0.49 (0.09)	0.67 (0.10)	0.49 (0.14) [0.15–0.85]
Rule of law	WGI subcomponent (RL)	Continuous (0–1)	0.28 (0.10)	0.40 (0.11)	0.52 (0.12)	0.74 (0.14)	0.53 (0.17) [0.13–0.91]
Control of corruption	WGI subcomponent (CC)	Continuous (0–1)	0.36 (0.05)	0.40 (0.04)	0.44 (0.05)	0.55 (0.09)	0.46 (0.09) [0.26–0.81]
Voice & accountability	WGI subcomponent (VA)	Continuous (0–1)	0.39 (0.12)	0.43 (0.11)	0.54 (0.12)	0.67 (0.12)	0.54 (0.15) [0.17–0.82]
National HDI	Human Development Index	Continuous (0–1)	0.53 (0.07)	0.67 (0.07)	0.79 (0.07)	0.92 (0.05)	0.76 (0.14) [0.38–0.99]
Subnational HDI SD	Within-country HDI inequality	Continuous (0–1)	0.050 (0.025)	0.046 (0.022)	0.038 (0.023)	0.022 (0.015)	0.041 (0.026) [0.005–0.126]
Income group	World Bank income classification	Ordinal (1–4)	—	—	—	—	2.76 (1.03) [1–4]
Region: SSA	Sub-Saharan Africa	Binary (1 = yes)	14 (66.7%)	18 (37.5%)	10 (22.7%)	2 (4.0%)	44 (26.7%)
Region: SA	South Asia	Binary (1 = yes)	3 (14.3%)	4 (8.3%)	1 (2.3%)	0 (0.0%)	8 (4.8%)
Region: LAC	Latin America & Caribbean	Binary (1 = yes)	1 (4.8%)	10 (20.8%)	12 (27.3%)	3 (6.0%)	26 (15.8%)
Region: MENA	Middle East & North Africa	Binary (1 = yes)	0 (0.0%)	4 (8.3%)	7 (15.9%)	4 (8.0%)	15 (9.1%)

Region: EAP	East Asia & Pacific	Binary (1 = yes)	2 (9.5%)	8 (16.7%)	8 (18.2%)	6 (12.0%)	24 (14.5%)
Region: ECA (ref.)	Europe & Central Asia	Binary (1 = yes)	1 (4.8%)	4 (8.3%)	6 (13.6%)	35 (70.0%)	46 (27.9%)

Note. M = mean; SD = standard deviation. Two countries with missing income codes excluded from all regression models (analytic n = 163). Thirteen countries without subnational HDI data excluded from Models C and D (n = 152). □ WGI composite = mean of six normalised [0–1] dimension scores (higher = better governance). □ Higher values indicate greater within-country development inequality. □ 1 = low income; 2 = lower middle income; 3 = upper middle income; 4 = high income (World Bank Atlas method). WGI = Worldwide Governance Indicators; HDI = Human Development Index; SSA = Sub-Saharan Africa; SA = South Asia; LAC = Latin America & Caribbean; MENA = Middle East & North Africa; EAP = East Asia & Pacific; ECA = Europe & Central Asia (reference category in all models).

Governance quality was positively correlated with birth registration ($r = .47$, $p < .001$). National HDI showed a stronger bivariate association ($r = .66$, $p < .001$), and subnational inequality showed a negative correlation ($r = -.62$, $p < .001$). Governance and HDI were highly collinear ($r = .75$), addressed through progressive model specification. Fig. 1 illustrates the bivariate governance–registration relationship across 165 countries.

Fig. 1. Governance Quality and Birth Registration Completeness Across 165 Countries

Note. Each point represents one country. Marker shapes distinguish world regions. Dashed line = OLS fit ($r^2 = .33$). Figures are grayscale-readable via marker shape coding.

Table 2 presents regression results. In Model A, governance significantly and positively predicted logit-transformed registration after controlling for income and region ($\beta = 0.42$, SE = 0.17, $p = .013$, 95% CI [0.09, 0.74]; $R^2 = .740$, $F = 57.78$, $p < .001$). Income group ($\beta = 0.98$, $p < .001$) and four of five regional contrasts were significant; MENA did not differ from the reference region ($\beta = 0.07$, $p = .897$). In Model B, HDI attenuated governance to non-significance ($\beta = 0.19$, $p = .272$); HDI itself was strongly significant ($\beta = 1.10$, SE = 0.32, $p < .001$), consistent with collinearity ($r = .75$). Model C maintained HDI significance ($\beta = 0.97$, $p = .004$); subnational inequality was directionally negative ($\beta = -0.22$, $p = .167$), with attenuation reflecting geographic clustering of inequality absorbed by region fixed effects. Model D found control of corruption as the only significant WGI subcomponent ($\beta = 0.42$, SE = 0.20, $p = .038$, 95% CI [0.02, 0.82]). Among low- and lower-middle-income countries (n = 69), governance remained positive but non-significant ($\beta = 0.38$, $p = .204$); HDI remained significant ($\beta = 1.03$, $p = .013$).

Fig. 2. Within-Country Development Inequality and Birth Registration Completeness

Note. Each point represents one country. Subnational HDI SD = standard deviation of province-level HDI scores. Dashed line = OLS fit ($r^2 = .42$). n = 152 countries with subnational HDI data.

Table 2 *OLS Regression Coefficients (β) and Standard Errors for Logit-Transformed Birth Registration Completeness*

Variable	Model A β (SE)	Model B β (SE)	Model C β (SE)	Model D β (SE)
WGI composite	0.42* (0.17)	0.19 (0.17)	0.18 (0.17)	—
Govt. effectiveness	—	—	—	0.25 (0.31)
Rule of law	—	—	—	−0.31 (0.30)
Control of corruption	—	—	—	0.42* (0.20)
National HDI	—	1.10*** (0.32)	0.97** (0.33)	0.80* (0.36)
Subnational HDI SD	—	—	−0.22 (0.16)	−0.21 (0.16)
Income group	0.98*** (0.21)	0.33 (0.28)	0.36 (0.28)	0.46 (0.28)
SSA	−2.97*** (0.44)	−2.25*** (0.47)	−2.10*** (0.48)	−2.24*** (0.49)
South Asia	−2.54*** (0.63)	−2.32*** (0.61)	−2.16** (0.62)	−2.42*** (0.62)
LAC	−2.17*** (0.36)	−1.83*** (0.36)	−1.79*** (0.36)	−1.86*** (0.36)
MENA	0.07 (0.53)	0.11 (0.51)	0.01 (0.52)	0.04 (0.53)
EAP	−2.37*** (0.40)	−2.05*** (0.39)	−2.02*** (0.39)	−2.08*** (0.39)
R^2	0.740	0.760	0.764	0.773
Adj. R^2	0.727	0.747	0.748	0.755
F	57.78***	54.09***	50.25***	42.71***
N	163	163	152	152

*Note. All continuous predictors standardised (M = 0, SD = 1). Outcome = logit-transformed birth registration proportion (children under 5). Reference region = Europe and Central Asia. SSA = Sub-Saharan Africa; LAC = Latin America & Caribbean; MENA = Middle East & North Africa; EAP = East Asia & Pacific. HDI = Human Development Index; SD = standard deviation. Models C and D: n = 152. Two countries with missing income codes excluded from all models (n = 163/152). * p < .05; ** p < .01; *** p < .001.*

Discussion and Conclusion

Three findings emerge. First, governance quality significantly predicts birth registration after controlling for income and region (β = 0.42, p = .013, R^2 = .740). Countries with stronger administrative institutions register more births, addressing the country-level unexplained variance documented by Ebbers and Smits (2022). The attenuation when HDI enters reflects governance–development collinearity (r = .75) rather than the absence of a governance effect; both the bivariate correlation (r = .47) and Model A coefficient confirm a meaningful independent association.

Second, control of corruption is the most consistently significant WGI subcomponent (β = 0.42, p = .038). This aligns with field evidence that informal fees charged by civil registrars systematically exclude the

poorest households (Fagbamigbe et al., 2021; Pullum et al., 2019). This is directly actionable: digitisation of registration records, electronic submission systems, and fee transparency mandates specifically target this barrier.

Third, subnational development inequality is negatively correlated with registration ($r = -.62$, $p < .001$). National registration averages conceal subnational disparities where administrative infrastructure is absent, reinforcing the need for spatially disaggregated civil registration programming and monitoring.

Limitations include the cross-sectional design, which precludes causal inference. The WGI draws on perception-based sources that may diverge from objective administrative performance and underrepresent subnational realities. Excluded countries were disproportionately small high-income territories, producing a slight conservative bias on the registration mean without affecting the governance–registration relationship. UNICEF survey estimates span approximately 2010–2023, introducing temporal inconsistency. Future research should employ longitudinal designs with georeferenced registration data matched to subnational governance indicators.

Birth registration completeness is a governance outcome as much as a demographic one. Achieving SDG 16's universal registration target requires attending to state administrative capacity — particularly controlling bureaucratic corruption — as much as to household-level barriers. Spatially disaggregated monitoring is essential to detect and address subnational gaps masked by national averages.

Declarations

Ethics Approval

This study used de-identified publicly available data and thus it was exempt from institutional ethics approval.

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Figures

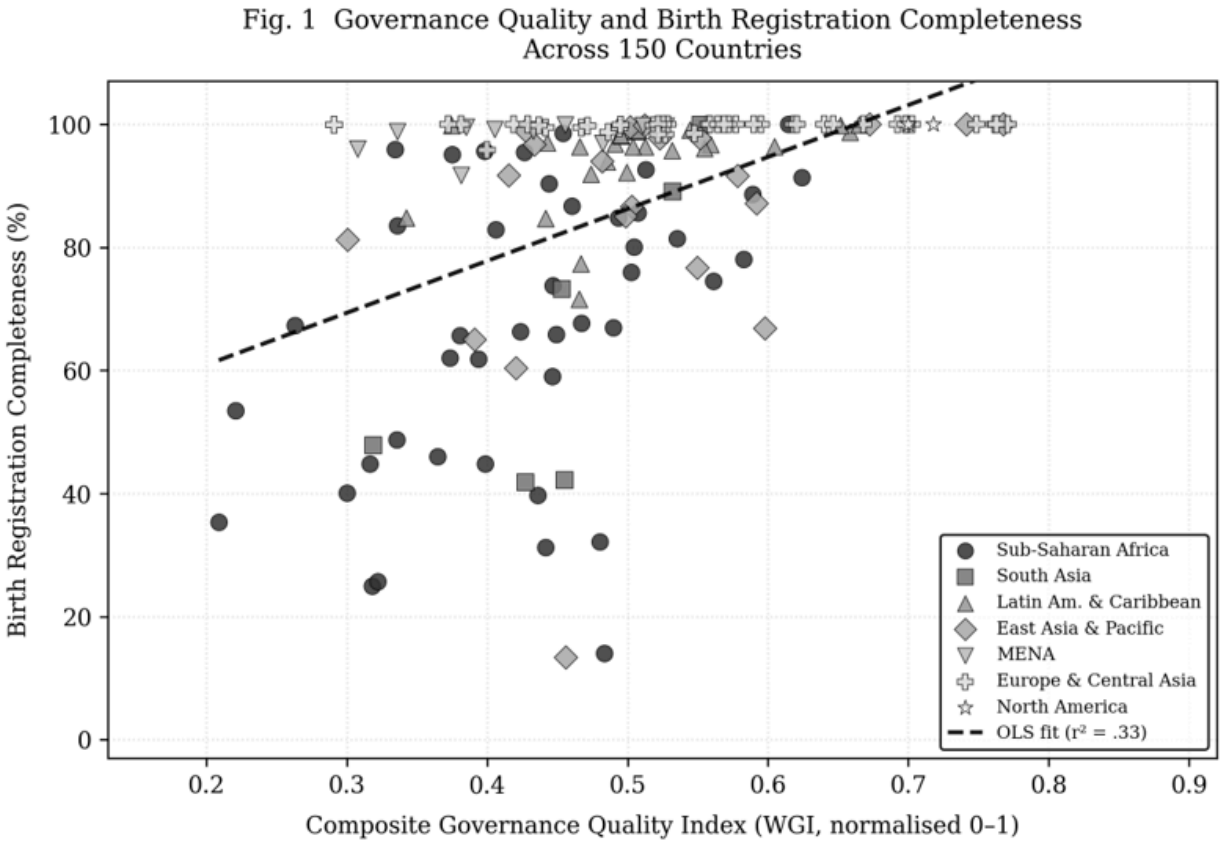


Figure 1

Governance Quality and Birth Registration Completeness Across 165 Countries

Note. Each point represents one country. Marker shapes distinguish world regions. Dashed line = OLS fit (r² = .33). Figures are grayscale-readable via marker shape coding.

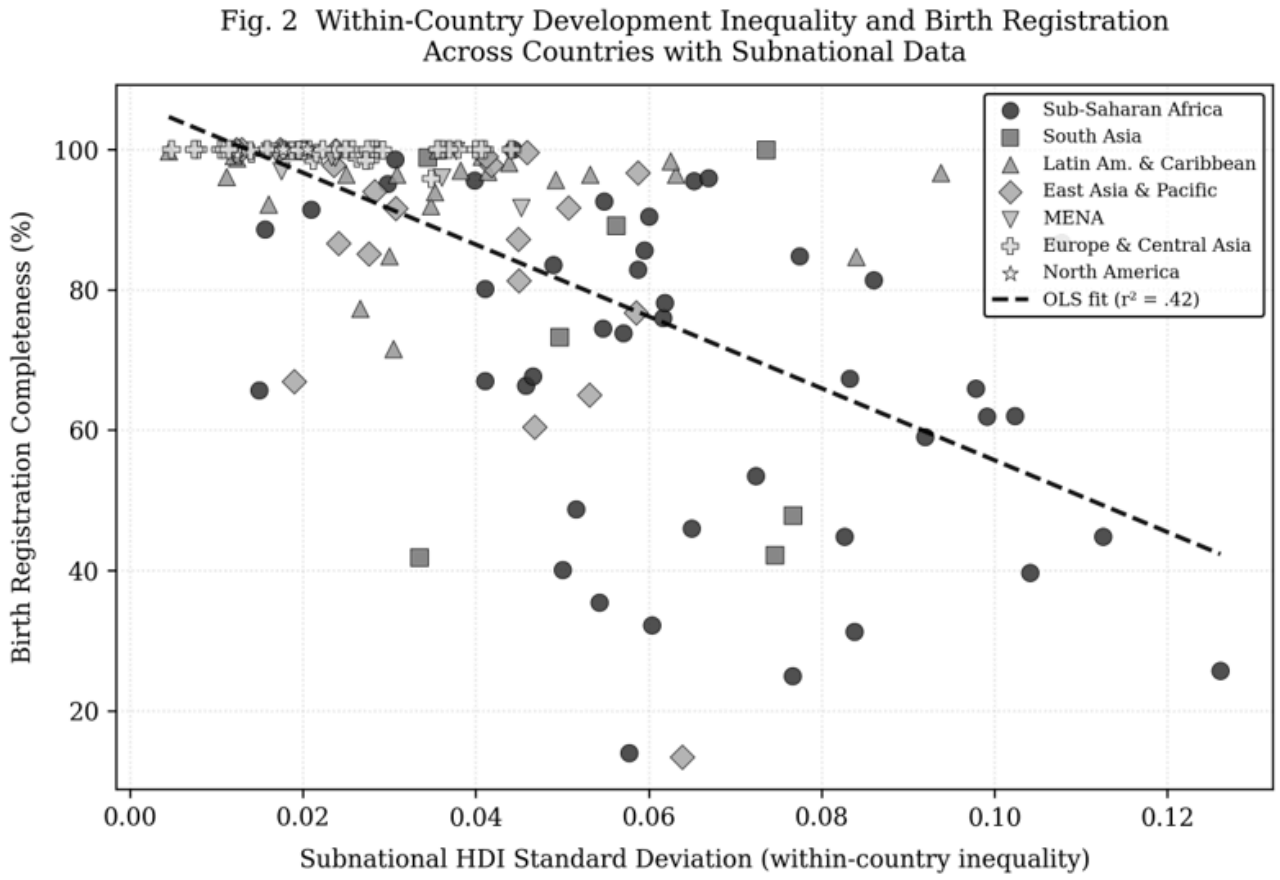


Figure 2

Within-Country Development Inequality and Birth Registration Completeness

Note. Each point represents one country. Subnational HDI SD = standard deviation of province-level HDI scores. Dashed line = OLS fit (r² = .42). n = 152 countries with subnational HDI data.

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