PARTNERSHIP FOR THE AMERICAS

TECHNICAL NOTE

Under-Connected Populations Index (UCI)

Technical Methodology & Data Documentation

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1. Executive Summary

The Under-Connected Populations Index (UCI) is a composite metric designed to quantify the extent to which populations in Latin America and the Caribbean (LAC) are excluded from meaningful mobile data connectivity. Unlike traditional binary measures of "connected" versus "unconnected," the UCI captures the critical intermediate category of people who live within the technical footprint of mobile broadband networks but cannot access or afford regular data services.

The index synthesizes four normalized gap indicators—infrastructure, affordability, device access, and usage behavior—into a single 0–100 score for each of 33 LAC countries. Higher scores indicate greater underconnectivity. The model estimates that approximately **275 million people (42% of the LAC population)** are underserved: **48.5 million** lack any mobile broadband coverage, while an additional **226.9 million** reside within coverage areas but face economic, device, or behavioral barriers to meaningful connectivity.

This document provides a complete technical specification of the UCI methodology, including all mathematical formulations, data sources, normalization procedures, weight rationale, population estimation models, and a transparent accounting of assumptions, caveats, and limitations. It is intended to enable replication, peer review, and adaptation by researchers and policy analysts.

2. Conceptual Framework

2.1 Defining "Under-Connected"

The concept of "under-connectivity" addresses a fundamental limitation of conventional digital inclusion metrics. The ITU, GSMA, and World Bank have historically reported mobile coverage and internet penetration as primary indicators of digital access. However, these measures fail to capture a large and growing population segment: individuals who are nominally "covered" by mobile broadband infrastructure but who cannot meaningfully participate in the digital economy due to affordability constraints, device limitations, or behavioral barriers.

The UCI framework recognizes three distinct population segments:

> ***Connected:*** *Individuals with reliable, regular access to mobile data services, typically characterized by postpaid plans, smartphone ownership, and usage patterns enabling participation in digital services.* ***Under-Connected:*** *Individuals residing within mobile broadband coverage areas who face one or more barriers preventing meaningful data access. This includes prepaid users with intermittent data top-ups, feature phone users limited to voice/SMS, individuals who share devices, and those who access the internet only through public WiFi or shared connections. This is the core target population of the UCI.* ***Unconnected:*** *Individuals living outside the geographic footprint of 3G or higher mobile broadband networks, for whom infrastructure deployment is the binding constraint.*

2.2 Multidimensional Barrier Model

Drawing on the GSMA Mobile Connectivity Index framework and the ITU ICT Development Index methodology, the UCI identifies four orthogonal dimensions of connectivity barriers:

> ***Infrastructure:*** *The physical availability of mobile broadband networks (3G, 4G/LTE, 5G) as a prerequisite for any data-based connectivity.* ***Affordability:*** *The economic accessibility of mobile data services relative to household income, following the ITU Broadband Commission target of 2% of GNI per capita for 1GB of data.* ***Device Access:*** *The penetration of unique mobile subscriptions as a proxy for device ownership, recognizing that access requires both network availability and a capable device.* ***Usage/Behavioral:*** *The gap between theoretical access (coverage) and actual internet adoption, capturing demand-side barriers including digital literacy, language, content relevance, and the behavioral patterns indicated by prepaid market dominance.*

3. Index Construction

The UCI is computed as a weighted linear combination of four normalized gap components, each scaled to the interval [0, 1], then multiplied by 100 to produce a score on the 0–100 scale:

> $$UCI = 100 \times [w_1 \times InfraGap + w_2 \times AffordGap + w_3 \times DeviceGap + w_4 \times UsageGap]$$
> *where* $w_1 = 0.20$, $w_2 = 0.30$, $w_3 = 0.20$, $w_4 = 0.30$, *and the sum of all weights = 1.00.*

Each component is constructed to satisfy the following properties: (a) **monotonicity**—higher values indicate worse outcomes; (b) **boundedness**—values are constrained to [0, 1]; (c) **interpretability**—each value has a clear policy meaning.

3.1 Component 1: Infrastructure Gap (InfraGap)

The Infrastructure Gap measures the proportion of a country's population that lacks access to mobile broadband networks of 3G or higher generation. It is the simplest component and serves as the supply-side baseline.

> ***InfraGap = (100 - Coverage3G+) / 100*** *where* ***Coverage3G+*** *is the percentage of the national population covered by at least 3G mobile broadband signal, as reported by the ITU and GSMA.*

Domain: InfraGap is in [0, 1]. A country with 100% 3G+ population coverage has InfraGap = 0; a country with 60% coverage (e.g., Cuba) has InfraGap = 0.40.

Example: Haiti has 78.0% 3G+ coverage, yielding InfraGap = (100 - 78.0) / 100 = **0.220**.

3.2 Component 2: Affordability Gap (AffordGap)

The Affordability Gap captures the economic barrier to data access, calibrated against the ITU Broadband Commission's affordability target of 2% of GNI per capita for 1GB of mobile data. Rather than a simple threshold, the UCI uses a continuous scaling function that increases linearly from the affordability target to a ceiling of 15% of monthly income, reflecting diminishing marginal likelihood of any data purchase at extreme cost ratios.

> ***AffordGap = min(Cost1GB% / 15.0, 1.0)*** *where* ***Cost1GB%*** *is the cost of 1GB of prepaid mobile data as a percentage of average monthly income (GNI per capita / 12). The divisor of 15.0 is the empirically observed upper bound in the LAC region (Haiti), above which data usage approaches zero.*

The clipping function min(., 1.0) ensures boundedness. Countries where 1GB costs less than ~1.0% of income (e.g., Chile at 0.9%) receive AffordGap values near 0.06, while Haiti (15%) reaches the ceiling of 1.0.

Example: Venezuela has Cost1GB% = 8.5%, yielding AffordGap = min(8.5 / 15.0, 1.0) = **0.567**.

3.3 Component 3: Device Access Gap (DeviceGap)

The Device Access Gap approximates the proportion of the population lacking personal access to a mobile device. It uses unique mobile subscriber penetration—the number of unique mobile subscribers as a percentage of the population—as a proxy for device ownership.

> ***DeviceGap = (100 - MobilePen) / 100*** *where* ***MobilePen*** *is the GSMA-reported unique mobile subscriber penetration rate (% of population). This differs from SIM penetration, which is inflated by multi-SIM ownership.*

Example: Guatemala has MobilePen = 55%, yielding DeviceGap = (100 - 55) / 100 = **0.450**.

3.4 Component 4: Usage/Behavioral Gap (UsageGap)

The Usage/Behavioral Gap is the most complex component, designed to capture demand-side barriers that persist even when infrastructure, affordability, and device conditions are met. It combines two sub-indicators: the coverage-usage gap and prepaid market dominance.

> ***UsageGap = clip(0.6 x CoverageUsageGap + 0.4 x PrepaidFactor, 0, 1)***
> ***CoverageUsageGap = (Coverage3G+ - InternetPct) / 100 PrepaidFactor = (PrepaidPct - 50) / 50 CoverageUsageGap*** *captures the difference between theoretical access (coverage) and actual internet usage. A large gap suggests demand-side barriers such as digital illiteracy, language barriers, lack of locally relevant content, or distrust of digital services.* ***PrepaidFactor*** *uses the share of prepaid subscriptions (above a 50% baseline) as a proxy for intermittent or economically constrained usage. Markets with very high prepaid shares (e.g., Haiti at 98%, Guatemala at 92%) exhibit usage patterns consistent with irregular data top-ups and consumption-smoothing behavior.*

Example: Nicaragua has Coverage3G+ = 75%, InternetPct = 52%, PrepaidPct = 91%. CoverageUsageGap = (75 - 52)/100 = 0.23. PrepaidFactor = (91 - 50)/50 = 0.82. UsageGap = clip(0.6 x 0.23 + 0.4 x 0.82, 0, 1) = **0.466**.

3.5 Composite UCI Calculation

The four gap components are combined using a weighted linear aggregation with the following default weights:

Component	Symbol	Weight	Rationale
Infrastructure Gap	w1	0.20 (20%)	Supply-side prerequisite; diminishing returns as LAC coverage approaches 90%+
Affordability Gap	w2	0.30 (30%)	Primary demand-side barrier identified in GSMA research; highest policy leverage
Device Access Gap	w3	0.20 (20%)	Intermediate barrier; partially captured by affordability
Usage/Behavioral Gap	w4	0.30 (30%)	Captures residual demand-side barriers; critical for under-connected segment

3.6 Weight Selection Rationale

The default weight vector (0.20, 0.30, 0.20, 0.30) was selected based on three considerations:

> ***Empirical evidence:*** *The GSMA's "State of Mobile Internet Connectivity" reports consistently identify affordability as the single largest barrier to mobile internet adoption globally, particularly in lower-middle-income markets that comprise much of LAC.* ***Policy alignment:*** *The UCI's conceptual focus on the "under-connected" segment—people within coverage who face economic barriers—motivates higher weights on affordability and usage behavior, as these are the dimensions that differentiate the under-connected from the merely unconnected.* ***Sensitivity analysis:*** *The interactive visualization includes weight adjustment sliders, allowing users to explore how UCI rankings change under alternative weight assumptions. The default weights produce rankings consistent with expert judgment and alternative indices (e.g., GSMA Mobile Connectivity Index, ITU ICT Development Index).*

4. Population Estimation Model

Beyond the composite index, the UCI includes a population estimation model that quantifies the number of people in each connectivity segment. This provides policymakers with absolute figures for targeting interventions.

4.1 Unconnected Population

> ***Unconnected = Population x (1 - Coverage3G+ / 100)*** *This counts individuals living outside the footprint of any 3G+ mobile broadband network.*

4.2 Under-Connected Population

The under-connected estimation is more nuanced, combining two sub-populations:

> ***CoveredPop = Population x (Coverage3G+ / 100) NonUsersInCoverage = CoveredPop x (1 - InternetPct / 100) PrepaidLimited = CoveredPop x (InternetPct / 100) x (PrepaidPct / 100) x 0.30 UnderConnected = NonUsersInCoverage + PrepaidLimited***

The first term (NonUsersInCoverage) captures people who have network access but do not use the internet at all. The second term (PrepaidLimited) identifies a subset of internet users—specifically, 30% of prepaid subscribers within coverage—who are assumed to be "severely data-limited," meaning their usage is so constrained by cost that it does not constitute meaningful connectivity.

4.3 The 30% Prepaid-Limited Assumption

The 30% prepaid-limited factor is an estimate derived from multiple data points:

- GSMA Intelligence reports that approximately 25–35% of prepaid subscribers in low- and middle-income countries top up data less than once per month.
- Alliance for Affordable Internet (A4AI) research indicates that roughly one-third of mobile internet users in developing markets report reducing data consumption due to cost.
- ECLAC household survey data from select LAC countries shows 20–40% of mobile users with “occasional” rather than “regular” internet access.

This parameter introduces meaningful uncertainty into the population estimates and should be treated as an adjustable assumption rather than a measured quantity. See Section 8 for a sensitivity analysis.

4.4 Total Underserved

> ***TotalUnderserved = Unconnected + UnderConnected UnderservedPct = (TotalUnderserved / Population) x 100***

5. Subnational Analysis

National-level aggregation masks significant within-country heterogeneity. The UCI includes subnational data points for the four most populous LAC countries—Brazil (5 macro-regions), Mexico (6 selected states), Colombia (5 departments), and Peru (3 geographic strata)—to illustrate subnational variation.

Subnational UCI estimates use a simplified calculation due to data limitations. Because subnational data on 1GB pricing and unique subscriber penetration are typically unavailable, the subnational model substitutes poverty rate as an affordability proxy and uses a fixed device gap estimate of 0.30:

> $$UCI_{sub} = 100 \times [0.20 \times InfraGap_{sub} + 0.30 \times PovertyRate/100 + 0.20 \times 0.30 + 0.30 \times UsageGap_{sub}]$$

This simplification introduces additional uncertainty but preserves the rank ordering of regions within countries, which is the primary analytical objective at the subnational level.

6. Data Sources & References

The UCI draws on publicly available data from the following authoritative sources. All data represent the most recent available observations, primarily from 2023–2025.

Data Element	Primary Source	Coverage
3G+ population coverage	ITU World Telecom/ICT Indicators (datahub.itu.int)	33 countries
Internet users (% population)	ITU / World Bank WDI (data.worldbank.org)	33 countries
Unique mobile subscriber penetration	GSMA Intelligence (gsmaintelligence.com)	33 countries
Prepaid vs. postpaid mix	GSMA Intelligence / National regulators	33 countries
Mobile data pricing (1GB)	Cable.co.uk / A4AI / ITU	33 countries
GNI per capita (affordability)	World Bank WDI (data.worldbank.org)	33 countries
Poverty rates (national)	World Bank / ECLAC CEPALSTAT	33 countries
Population estimates	UN DESA World Population Prospects	33 countries
Subnational internet usage	National statistical offices (IBGE, INEGI, DANE, INEI)	4 countries
Subnational poverty data	National statistical offices	4 countries

6.1 National Statistical Office Sources

- **Brazil:** IBGE – Pesquisa Nacional por Amostra de Domicílios (PNAD)
- **Mexico:** INEGI – Encuesta Nacional sobre Disponibilidad y Uso de TIC (ENDUTIH)
- **Colombia:** DANE – Gran Encuesta Integrada de Hogares / MinTIC Boletín Trimestral
- **Peru:** INEI – Encuesta Nacional de Hogares (ENAHO)

7. Visualization Methodology

7.1 Interactive Map

The primary output is a self-contained HTML/JavaScript interactive map built on the Leaflet.js mapping library with CARTO dark-theme basemap tiles. Key design decisions include:

- Graduated circle symbols sized by national population (square-root scaling to preserve visual proportionality) and colored by UCI score using a divergent five-class scheme.
- Subnational data points rendered as rotated square (diamond) markers to visually distinguish them from national-level circles.
- Interactive weight adjustment sliders allowing users to modify the four component weights in real time, with automatic UCI recalculation and re-rendering.
- A sidebar country ranking with region filters (South America, Central America, Caribbean) and click-to-zoom functionality.

7.2 Color Classification Scheme

UCI scores are classified into five severity categories using a modified Jenks natural breaks scheme:

Category	UCI Range	Color	Interpretation
Critical	50+	#8b0000 (Dark Red)	Severe systemic underconnectivity across multiple dimensions
High	35–50	#d7191c (Red)	Significant barriers requiring multi-sector policy intervention
Medium	25–35	#fdae61 (Orange)	Moderate underconnectivity with specific addressable barriers
Low	15–25	#a6d96a (Yellow-Green)	Emerging connectivity with remaining affordability/usage gaps
Very Low	<15	#1a9641 (Green)	Broad connectivity with residual inclusion challenges

8. Limitations, Caveats & Assumptions

The UCI is designed to provide a useful first-order approximation of underconnectivity across the LAC region using publicly available data. Users should be aware of the following limitations:

8.1 Data Recency and Consistency

Data elements are drawn from sources with different reporting cycles and reference years (2022–2025). ITU coverage data may lag actual network deployments by 12–18 months. Cross-country comparability is limited by differences in national statistical methodologies, particularly for internet usage definitions (e.g., “used the internet in the past 3 months” vs. “past 12 months”).

8.2 Aggregation Bias

National-level indicators mask significant subnational variation. A country like Brazil with UCI = 12.5 contains regions ranging from UCI ~11 (Center-West) to UCI ~25 (North/Northeast). National-level policy recommendations based solely on country scores may misallocate resources.

8.3 Proxy Variables

Several indicators are proxies rather than direct measures. Unique subscriber penetration is an imperfect proxy for device ownership (it excludes WiFi-only tablet users and shared devices). Prepaid share is an indirect indicator of usage intensity. National poverty rates do not capture the income distribution of mobile users specifically.

8.4 The 30% Prepaid-Limited Factor

The assumption that 30% of prepaid subscribers are "severely data-limited" is a point estimate within a plausible range of 20–40%. A sensitivity analysis shows that varying this parameter from 0.20 to 0.40 changes total LAC underserved estimates by approximately **±30 million people (±11%)**, affecting country-level rankings by up to 3 positions.

8.5 Linear Aggregation Assumption

The weighted linear combination assumes that the four dimensions are compensatory—i.e., a high score on one dimension can be partially offset by a low score on another. This may not reflect reality if certain dimensions represent binding constraints. A geometric or penalty-based aggregation (as used in the Human Development Index since 2010) would address this but introduces additional complexity.

8.6 Exclusion of Quality Metrics

The UCI does not differentiate between 3G, 4G, and 5G coverage quality. A country with 95% 3G-only coverage and a country with 95% 4G/5G coverage receive the same InfraGap score, despite fundamentally different user experiences. Network quality indicators (average throughput, latency, reliability) are not incorporated due to data limitations.

8.7 WiFi and Fixed Broadband

The UCI focuses exclusively on mobile broadband connectivity and does not account for fixed broadband or public WiFi access. In some LAC countries (notably Costa Rica and Uruguay), government-sponsored WiFi programs materially expand effective connectivity beyond what mobile-only metrics capture.

8.8 Gender and Demographic Dimensions

The current framework does not disaggregate underconnectivity by gender, age, ethnicity, or disability status. GSMA research indicates that women in LAC are **7% less likely** than men to use mobile internet, suggesting that the UCI's national-level estimates systematically understate underconnectivity for women and other marginalized groups.

9. Recommendations for Data & Methodological Improvement

The UCI methodology can be significantly strengthened through the following enhancements, listed in approximate order of impact and feasibility:

1. **Acquire GSMA Intelligence licensed data:** Full access to GSMA Intelligence datasets would provide quarterly-updated, standardized, carrier-level data on subscriber counts, ARPU, data traffic volumes, network technology mix, and smartphone penetration for all 33 LAC markets. This single investment would resolve limitations 8.1, 8.3, and 8.6.

2. **Integrate Ookla/Speedtest or M-Lab network quality data:** Open-source network performance data from Ookla Speedtest Intelligence or M-Lab would enable incorporation of download speed, latency, and reliability metrics into the InfraGap component.
3. **Commission subnational household survey analysis:** Partnering with national statistical offices to run custom tabulations of existing household surveys (PNAD, ENDUTIH, ENAHO) would provide district-level underconnectivity estimates with proper confidence intervals.
4. **Apply geometric aggregation:** Replacing the weighted arithmetic mean with a geometric mean or penalized aggregation would better reflect the non-compensatory nature of connectivity barriers, aligning with HDI methodology best practices (Alkire & Foster, 2011).
5. **Add gender disaggregation:** The GSMA publishes a Mobile Gender Gap Report with country-level data on women's mobile internet adoption. Integrating this would enable gender-sensitive UCI scores.
6. **Conduct formal sensitivity and uncertainty analysis:** Monte Carlo simulation over the parameter space (weights, 30% prepaid factor, data uncertainty) would yield confidence intervals for UCI scores and identify which countries are most sensitive to methodological choices.

Appendix A: Country-Level UCI Scores

The following table presents UCI scores and component values for all 33 LAC countries, sorted by UCI score (descending). All data represent the most recent available observations from 2023–2025.

Country	Pop(M)	UCI	3G+ %	Net%	Pre%	Pov%	1GB %	Mob %	Unc(M)	Und(M)	Tot(M)
Haiti	11.9	65.3	78	39.3	98	59.0	15.0	38	2.62	6.71	9.33
Cuba	10.9	53.0	60	68.0	95	45.0	12.0	42	4.36	3.36	7.72
Venezuela	28.4	42.0	82	60.0	85	82.0	8.5	55	5.11	12.88	17.99
Nicaragua	7.0	40.0	75	52.0	91	44.0	5.5	50	1.75	3.27	5.02
Honduras	10.4	37.2	78	58.2	90	52.0	5.0	52	2.29	4.67	6.96
Guatemala	18.1	36.3	82	56.1	92	47.0	4.5	55	3.26	8.81	12.07
St. Vincent	0.1	31.4	85	65.0	80	30.0	4.0	52	0.02	0.05	0.07
Belize	0.4	31.4	80	62.0	80	41.0	4.0	55	0.08	0.17	0.25
Bolivia	12.4	31.4	80	62.0	88	36.4	3.5	60	2.48	5.39	7.87
Grenada	0.1	28.7	88	68.0	78	32.0	3.5	55	0.02	0.05	0.07
Suriname	0.6	28.6	78	66.0	80	37.0	3.2	58	0.13	0.23	0.36
El Salvador	6.3	28.1	88	67.7	85	26.2	2.8	60	0.76	2.75	3.51
Dominica	0.1	27.3	88	72.0	75	29.0	3.5	55	0.01	0.03	0.04
Saint Lucia	0.2	26.0	90	70.0	75	25.0	3.0	58	0.02	0.07	0.09
Guyana	0.8	25.9	75	85.0	82	35.0	3.0	55	0.20	0.22	0.42

Country	Pop(M)	UCI	3G+ %	Net%	Pre%	Pov%	1GB %	Mob %	Unc(M)	Und(M)	Tot(M)
Paraguay	6.9	24.5	88	72.0	80	24.7	2.2	62	0.83	2.75	3.58
Jamaica	2.8	23.6	92	82.0	80	18.0	2.5	60	0.22	0.97	1.19
Ecuador	18.2	23.2	90	69.0	70	25.0	2.6	63	1.82	7.45	9.27
Colombia	52.3	23.0	93	65.6	72	33.0	2.4	67	3.66	23.62	27.28
Panama	4.5	22.2	90	68.0	72	21.4	2.0	65	0.45	1.89	2.34
Peru	34.0	21.6	89	79.9	74	25.9	2.8	68	3.74	11.45	15.19
Dom. Republic	11.5	19.7	93	82.0	72	23.0	2.0	65	0.80	3.82	4.62
Mexico	129.7	19.5	95	83.1	78	36.3	1.8	70	6.49	44.78	51.27
St. Kitts	0.1	19.3	92	78.0	65	15.0	2.0	62	0.00	0.02	0.02
Trinidad & T.	1.5	17.6	95	79.0	68	15.0	1.5	68	0.08	0.53	0.61
Antigua & B.	0.1	13.7	95	91.0	60	18.0	1.8	70	0.01	0.02	0.03
Barbados	0.3	13.6	96	88.0	60	14.0	1.5	70	0.01	0.08	0.09
Brazil	211.1	12.5	98	84.0	55	22.0	1.5	73	5.28	61.46	66.74
Bahamas	0.4	12.4	95	92.0	62	12.0	1.2	72	0.02	0.10	0.12
Costa Rica	5.2	11.7	96	90.0	55	20.0	1.5	72	0.21	1.24	1.45
Argentina	46.7	11.7	97	87.1	58	39.2	1.2	75	1.40	12.71	14.11
Chile	19.6	8.5	98	90.2	52	6.5	0.9	78	0.29	4.61	4.90
Uruguay	3.4	7.0	98	90.0	45	5.0	0.8	76	0.07	0.74	0.81

Appendix B: Subnational Data Points

Subnational estimates for selected regions in Brazil, Mexico, Colombia, and Peru. UCI values are approximate and use the simplified subnational formula described in Section 5.

Region	Pop (M)	Est. UCI	Internet%	Poverty%	Coverage%
Brazil – North	18.9	23.7	76.0	40.0	85
Brazil – Northeast	55.4	24.9	75.0	42.0	88
Brazil – Southeast	89.6	13.1	90.0	14.0	99
Brazil – South	30.4	12.1	89.0	10.0	98
Brazil – Center-West	16.8	11.2	93.1	12.0	95
Mexico – Chiapas	5.9	40.6	50.7	75.5	72
Mexico – Oaxaca	4.1	36.8	55.5	66.4	75
Mexico – Guerrero	3.7	34.2	58.9	60.4	78
Mexico – Sonora	3.1	15.9	91.3	26.0	95
Mexico – Mexico City	9.2	19.8	84.4	30.6	99
Mexico – Quintana Roo	2.0	17.2	90.7	30.0	94
Colombia – Bogotá	8.4	16.4	82.0	17.0	99
Colombia – Valle del Cauca	4.9	22.8	70.0	28.0	94
Colombia – Chocó	0.5	45.0	20.0	65.0	55

Region	Pop (M)	Est. UCI	Internet%	Poverty%	Coverage%
Colombia – Vaupés	0.05	45.6	18.0	70.0	40
Colombia – Vichada	0.08	44.9	19.0	68.0	42
Peru – Lima Metro	11.0	12.7	91.2	14.0	99
Peru – Rest Urban	13.0	17.3	81.7	22.0	92
Peru – Rural	10.0	28.9	55.8	42.0	70

Sources

The following sources were used in the construction of the Under-Connected Populations Index and the preparation of this Technical Note.

- International Telecommunication Union (ITU). **World Telecommunication/ICT Indicators Database.** Geneva: ITU, 2024.
- World Bank. **Individuals Using the Internet (% of Population).** World Development Indicators, 2024.
- World Bank. **GNI Per Capita, Atlas Method (Current US$).** World Development Indicators, 2024.
- GSMA Intelligence. **Mobile Connectivity Index and Country Dashboards.** London: GSMA, 2024.
- GSMA. **The State of Mobile Internet Connectivity Report 2024.** London: GSMA Connected Society, 2024.
- GSMA. **The Mobile Gender Gap Report 2024.** London: GSMA Connected Society, 2024.
- Cable.co.uk. **Worldwide Mobile Data Pricing 2024.** Annual global survey of 1GB prepaid mobile data costs.
- Alliance for Affordable Internet (A4AI). **Affordability Report.** Web Foundation / A4AI, 2023.
- United Nations Department of Economic and Social Affairs (UN DESA). **World Population Prospects 2024.** Population Division, 2024.
- Economic Commission for Latin America and the Caribbean (ECLAC). **CEPALSTAT: Statistical Databases and Publications.** Santiago: ECLAC, 2024.
- Instituto Brasileiro de Geografia e Estatistica (IBGE). **Pesquisa Nacional por Amostra de Domicilios Continua (PNAD).** Rio de Janeiro: IBGE, 2024.
- Instituto Nacional de Estadistica y Geografia (INEGI). **Encuesta Nacional sobre Disponibilidad y Uso de TIC en Hogares (ENDUTIH).** Mexico City: INEGI, 2023.
- Departamento Administrativo Nacional de Estadistica (DANE). **Gran Encuesta Integrada de Hogares: Modulo TIC.** Bogota: DANE, 2024.
- Instituto Nacional de Estadistica e Informatica (INEI). **Encuesta Nacional de Hogares (ENAHO).** Lima: INEI, 2024.
- Alkire, S. and J. Foster (2011). **"Counting and Multidimensional Poverty Measurement."** *Journal of Public Economics*, 95(7-8): 476-487.
- Broadband Commission for Sustainable Development. **2025 Advocacy Targets: Connecting the Other Half.** Geneva: ITU/UNESCO, 2023.