Supplementary Material

Multi-Scale Drivers of Child Health in India: Internet Access Is Associated with Between-State but Not Within-State Variation

This document contains supplementary tables and figures referenced in the main manuscript. Items are presented in the order they are first cited in the main paper.

Supplementary Table S1: State-level descriptive statistics

Statistic	T	W	P	C	I	HOI
n	36	36	36	36	36	36
Mean	41.83	66.06	63.23	48.67	63.90	57.17
SD	25.39	21.51	23.86	22.75	17.59	21.01
Min	0.00	10.60	3.11	5.12	11.74	4.51
Median	41.07	70.29	65.91	49.18	61.88	57.40
Max	98.66	100.00	99.38	100.00	95.47	85.92

State-level descriptive statistics for composite vectors and HOI, 0 to 100 scale, n = 36. Indices computed from FR375 published state-level values using min-max normalization.

Supplementary Table S2: State-level regression detail (Model A)

Variable	Coef (beta)	SE	t	p	CI Lower	CI Upper
Intercept	8.127	10.194	0.797	0.4320	-11.854	28.107
T (Internet access)	0.400	0.141	2.836	0.0080	0.124	0.677
W (Workforce)	0.407	0.249	1.636	0.1120	-0.081	0.895
P (Policy)	0.092	0.232	0.395	0.6950	-0.363	0.546
C (Community)	-0.073	0.183	-0.401	0.6910	-0.431	0.285
I (Infrastructure)	0.050	0.193	0.257	0.7990	-0.329	0.429

State-level regression coefficients, Model A. Internet access is the single significant independent predictor. n = 36. R-squared = 0.60. Adjusted R-squared = 0.53. $F(5, 30) = 8.94$, $p < 0.001$.

Supplementary Table S3: District-level descriptive statistics

Statistic	T	W	P	C	I	HOI
n	707	707	707	707	707	707
Mean	45.33	73.94	69.40	53.06	57.44	60.68
SD	18.55	16.04	17.93	20.66	14.30	14.34

Statistic	T	W	P	C	I	HOI
Min	8.39	10.44	0.74	0.59	9.62	20.66
Median	42.67	75.99	71.92	52.44	56.39	61.85
Max	98.50	100.00	100.00	100.00	97.75	97.31

District-level descriptive statistics for composite vectors and HOI, 0 to 100 scale, n = 707. Indices computed from NFHS-5 microdata.

Supplementary Figure S1: District-level Pearson correlation matrix

District-level Pearson correlation matrix (n = 707). The Internet-Infrastructure cell, r = 0.10, is the lowest correlation among all vector pairs at this scale. The Workforce-Policy correlation is 0.83. All other pairs exceed 0.23.

Supplementary Figure S2: First-difference coefficients

First-difference coefficients with 95% confidence intervals from the two-wave first-difference association model (NFHS-4 to NFHS-5, n = 620 districts, 34 states, state fixed effects, cluster-robust SE). Policy and Community are positive and significant. Workforce and Infrastructure are not distinguishable from zero. The pattern is consistent with the within-state cross-sectional finding from Model C.

Supplementary Table S4: Drop-one-indicator robustness check

Specification	beta_T	beta_W	beta_P	beta_C	beta_I	within-R-sq
Baseline (both indicators per vector)	0.039	0.023	0.267 ***	0.248 ***	0.196	0.310
Drop T2 (men's internet); T1 only	0.044	0.023	0.265 ***	0.241 ***	0.196	0.311
Drop T1 (women's internet); T2 only	0.014	0.033	0.271 ***	0.259 ***	0.194	0.309
Drop W2 (skilled birth); W1 only	0.045	-0.017	0.286 ***	0.253 ***	0.198 *	0.310
Drop W1 (ANC doctor); W2 only	0.037	0.065	0.270 ***	0.243 ***	0.149	0.311
Drop P2 (any-skilled ANC); P1 only	0.054	0.125	0.168 **	0.240 ***	0.200	0.295
Drop P1 (ANC 4+); P2 only	0.040	0.042	0.195 ***	0.242 ***	0.226 *	0.302
Drop C2 (schooling); C1 only	0.060	0.028	0.260	0.210	0.204	0.310

Specification	beta_T	beta_W	beta_P	beta_C	beta_I	within-R-sq
			***	***		
Drop C1 (literacy); C2 only	0.043	0.047	0.263 ***	0.226 ***	0.209 *	0.295
Drop I2 (insurance); I1 only	0.040	-0.063	0.306 ***	0.233 ***	0.194	0.313
Drop I1 (facility); I2 only	0.036	0.083	0.268 ***	0.265 ***	0.053	0.303

Drop-one-indicator robustness check on Model C (district plus state fixed effects, n = 707, cluster-robust SE at state level). Each row drops one of the ten indicators and rebuilds the affected vector from the remaining indicator. Significance: *** p < 0.001, ** p < 0.01, * p < 0.05. The headline (Internet access insignificant within-state; Policy and Community strong within-state) holds across all ten alternative specifications.

Supplementary Table S5: National validation table for NFHS-4 and NFHS-5

Indicator	NFHS-4 rebuilt	NFHS-4 published	NFHS-5 rebuilt	NFHS-5 published	Match
T1 women's internet use	not measured	not measured	34.7%	33.3%	within 2 pp
T2 men's internet use	not measured	not measured	64.0%	62.4%	within 2 pp
W1 ANC from doctor	65.4%	approximately 65%	65.0%	64.2%	within 1 pp
W2 skilled birth	81.4%	81.4%	90.6%	89.4%	within 2 pp
P1 ANC 4+ visits	51.6%	51.2%	59.3%	58.1%	within 2 pp
P2 ANC any-skilled	83.9%	83.5%	92.1%	91.2%	within 1 pp
C1 women literate	61.9%	61.9%	71.4%	71.5%	within 1 pp
C2 women 10+ years schooling	35.7%	35.7%	41.0%	41.0%	exact
I1 facility delivery	78.9%	78.9%	90.1%	88.6%	within 2 pp
I2 mother's insurance	19.3%	(household-level 28.7%)	23.8%	(household-level 41.0%)	mother-level vs household-level expected to differ

Indicator	NFHS-4 rebuilt	NFHS-4 published	NFHS-5 rebuilt	NFHS-5 published	Match
HOI1 full vaccination	62.0%	62%	76.7%	approximately 77%	within 1 pp
HOI2 stunting	38.4%	38.4%	35.5%	35.5%	exact

National validation table comparing weighted national means computed from the microdata rebuild against published NFHS-4 and NFHS-5 figures. Agreement is within 1 to 2 percentage points for all comparable indicators. The mother-level insurance indicator (I2) intentionally differs from the household-level published figure because the mother-level value is the conceptually correct quantity for a consistent-universe analysis. T1 and T2 (internet use) were not measured in NFHS-4.