

West Bank Digital Deserts

Camp-level evidence for targeted digital-inclusion policy

Digital Desert Index (DDI) · uncertainty-aware camp-level proxy
19 UNRWA-registered refugee camps · six UMC-aligned dimensions
Analysis cutoff: 18 July 2026

ITU UMC Data Hackathon · WTIS-26 · Geneva

READ THIS FIRST

An indicative proxy index. Higher DDI = greater modeled deprivation. Not an official ITU measurement, not a real-time infrastructure assessment, not a measure of humanitarian severity.



Camp anchors on the geoBoundaries West Bank outline

Why national averages hide digital deserts

A national figure describes the average — not the communities furthest from connection.



19

camps

the full scoped population, not a sample



6

UMC-aligned dimensions

one transparent, reproducible framework



43.5

points of DDI spread

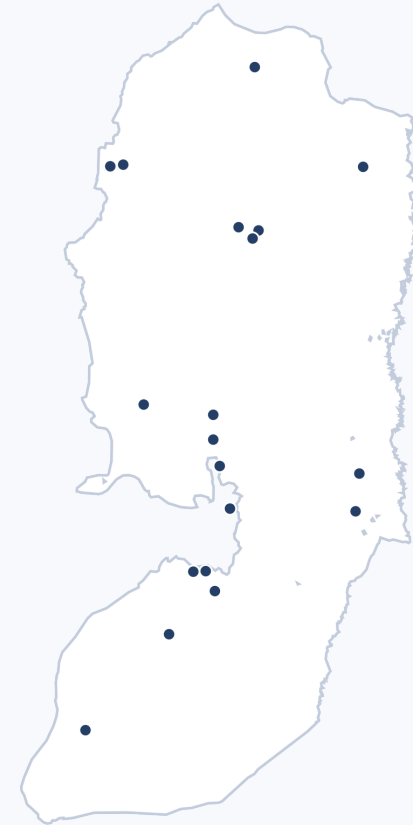
33.5 Beit Jibrin → 77.0 Jenin



≈ 1.15M

registered with UNRWA in the West Bank

Only ≈25% (~290k) live in camps



The 19 camps outline

■ PROBLEM CONTEXT

Why camp-level connectivity is hard to measure

No single dataset measures all six UMC dimensions at camp level.

■ Limited direct measurement

Skills and Safety observed directly in 4 of 19 camps; the other 15 are MICE-imputed.

■ Gaps in connection-quality data

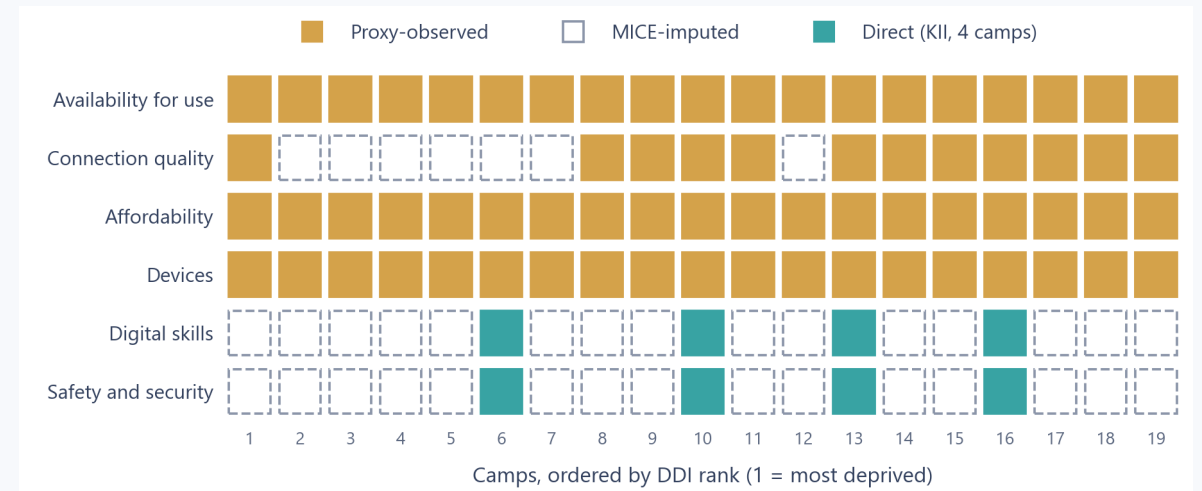
7 of 19 camps intersect no Ookla speed-test tile — including ranks 2–5.

■ Boundary uncertainty

No official UNRWA geometry: 9 of 19 footprints are low-confidence; 2 fall back to 400 m circles.

■ Uneven OSM coverage

The affordability proxy is confounded with OSM completeness — absence is not proof of absence.



Source status of every cell in the 19 × 6 dimension matrix

WHAT IT SHOWS

Comparative patterns across all 19 camps, with uncertainty attached.

WHAT IT CANNOT SAY

Household connectivity today, live infrastructure status, or humanitarian severity.

A UMC-aligned framework — six dimensions

Each dimension scored 0–100 (higher = better), then inverted and averaged into the DDI.



Availability for use

Telecom-infrastructure density ·
OpenStreetMap

PROXY



Connection quality

Fixed-broadband speed · Ookla Open
Data

PROXY · IMPUTED FOR 7 CAMPS



Affordability

ITU/A4AI price basket × OSM
economic-access pressure

PROXY



Devices

PCBS household ICT survey × OSM
access points

PROXY



Digital skills

Key-informant fieldwork (4 camps) +
MICE (15 camps)

DIRECT (4) + IMPUTED (15)



Safety and security

Key-informant fieldwork (4 camps) +
MICE (15 camps)

DIRECT (4) + IMPUTED (15)

DIMENSION SCORES

0–100 per UMC-aligned proxy
higher = better conditions



INVERT & WEIGHT

$DDI_i = \sum_j w_j \cdot (100 - \text{Score}_{ij})$
equal weights, $w_j = 1/6$



READ THE INDEX

higher DDI = greater modeled deprivation
rank 1 = most deprived

Equal weights are primary; PCA reweighting is a robustness check only (rank agreement $\rho = 0.995$).

■ DATA & METHODS

From raw sources to a ranked index

Every stage reads from disk, writes back to disk, and logs what it did and why.

SOURCES · OBSERVATION PERIODS DOCUMENTED



PIPELINE

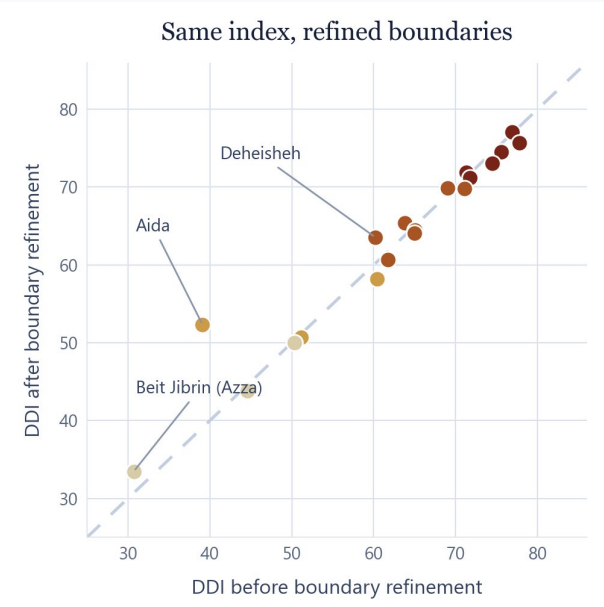


Boundary methodology — spatial accuracy

Formula, weights and imputation held constant — only the boundary footprints are refined.



Project-derived geometry — not official UNRWA boundaries



Same index, refined boundaries

Boundary effects isolated

Earlier spec reproduced first.

Ranks stay highly stable

Spearman $\rho = 0.974$ after refinement.

Confidence is graded

2 medium-high · 8 medium · 9 low.

Far'a needs verification

Rank 2, high uncertainty, 400 m circle.

What this index is — and is not

Limitations are part of the specification — stated up front and carried on every output.



Proxy, not ground truth

Not a direct measurement



Indicative, not inferential

n = 19, full population · no causal claims



Mixed source periods

2022–2026, documented per source



Imputation stays visible

Skills & Safety 15/19 · Connection 7/19



OSM absence ≠ absence

Mapping gaps inherited as bias



Overlap ≠ impact

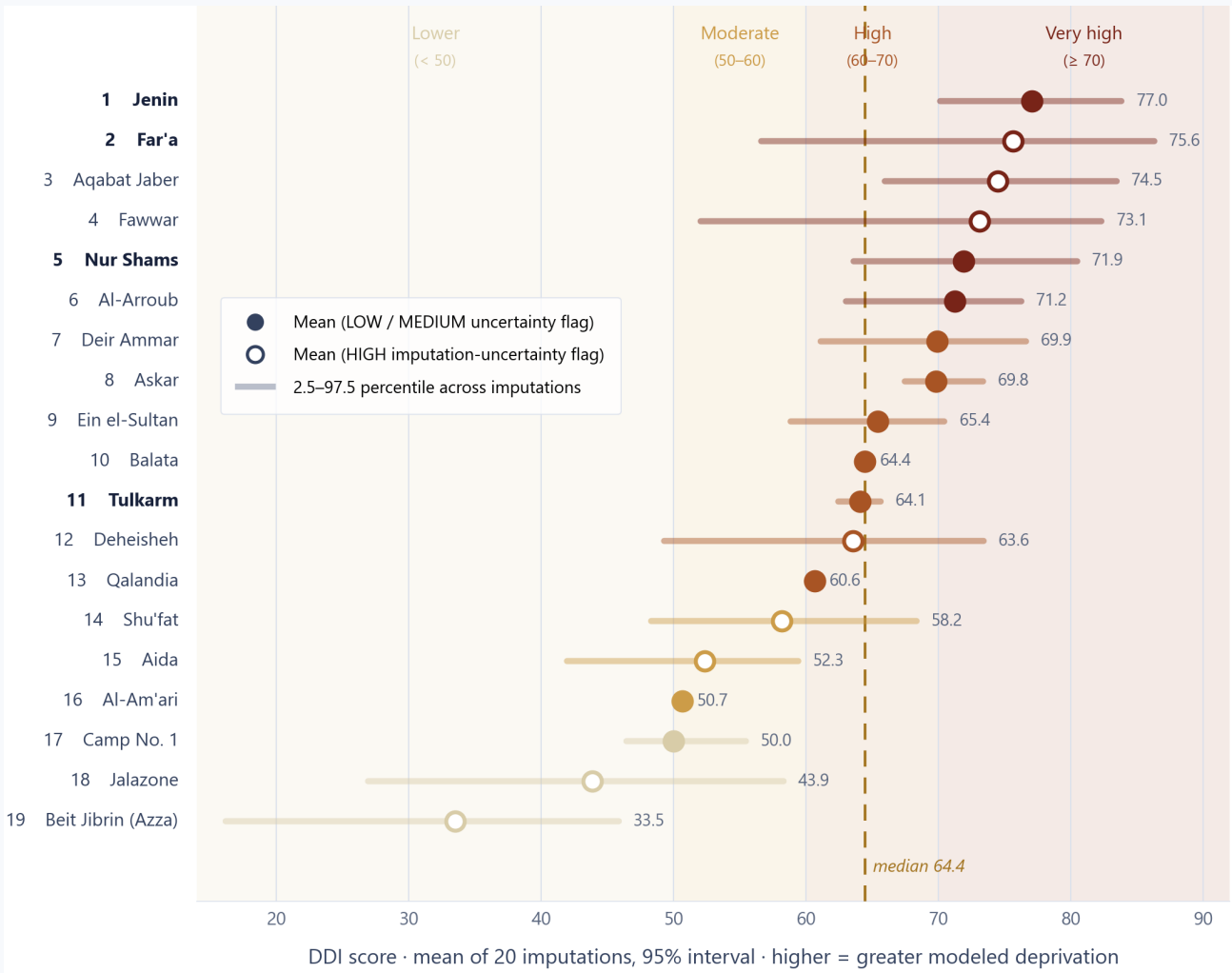
Not a damage assessment

Uncertainty is part of the evidence, not an afterthought.

■ RESULTS

The Digital Desert Index — all 19 camps

Mean DDI across 20 imputations, with 95% intervals and presentation bands.



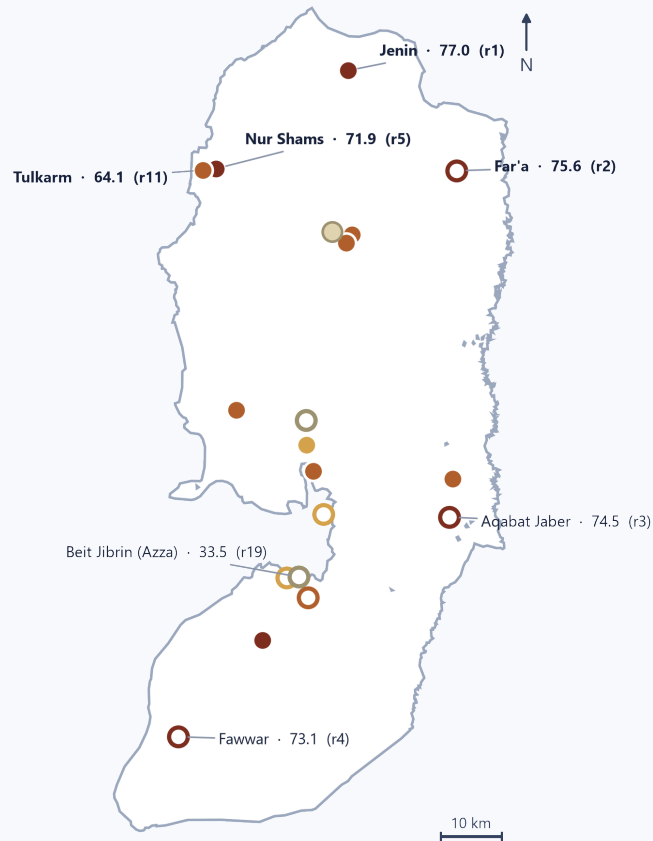
FOUR CAMPS TO READ FIRST

- **Jenin — rank 1 · 77.0**
Highest modeled deprivation; availability and connection-quality proxies reach 100.
- **Far'a — rank 2 · 75.6**
95% interval spans 56.6–86.3 — HIGH uncertainty flag and a fallback-circle boundary.
- **Nur Shams — rank 5 · 71.9**
Very-high band on a medium-high-confidence named OSM polygon.
- **Tulkarm — rank 11 · 64.1**
Mid-table DDI. Modeled digital deprivation — not humanitarian severity.

■ RESULTS

Where modeled deprivation concentrates

All 19 camps on project-derived geometry, encoded by DDI presentation band.



DDI PRESENTATION BAND

● **Very high**
DDI ≥ 70

● **High**
 $60 \leq \text{DDI} < 70$

● **Moderate**
 $50 \leq \text{DDI} < 60$

● **Lower**
DDI < 50

○ Open ring = HIGH imputation-uncertainty flag

■ Very high deprivation is geographically dispersed

Jenin, Far'a and Nur Shams in the north; Al-Arroub and Fawwar in the Hebron south; Aqabat Jaber near Jericho.

■ No statistically clear spatial clustering

Global Moran's I = 0.014 ($p = 0.248$) — exploratory, not a confirmed cluster structure.

■ Adjacent camps can differ sharply

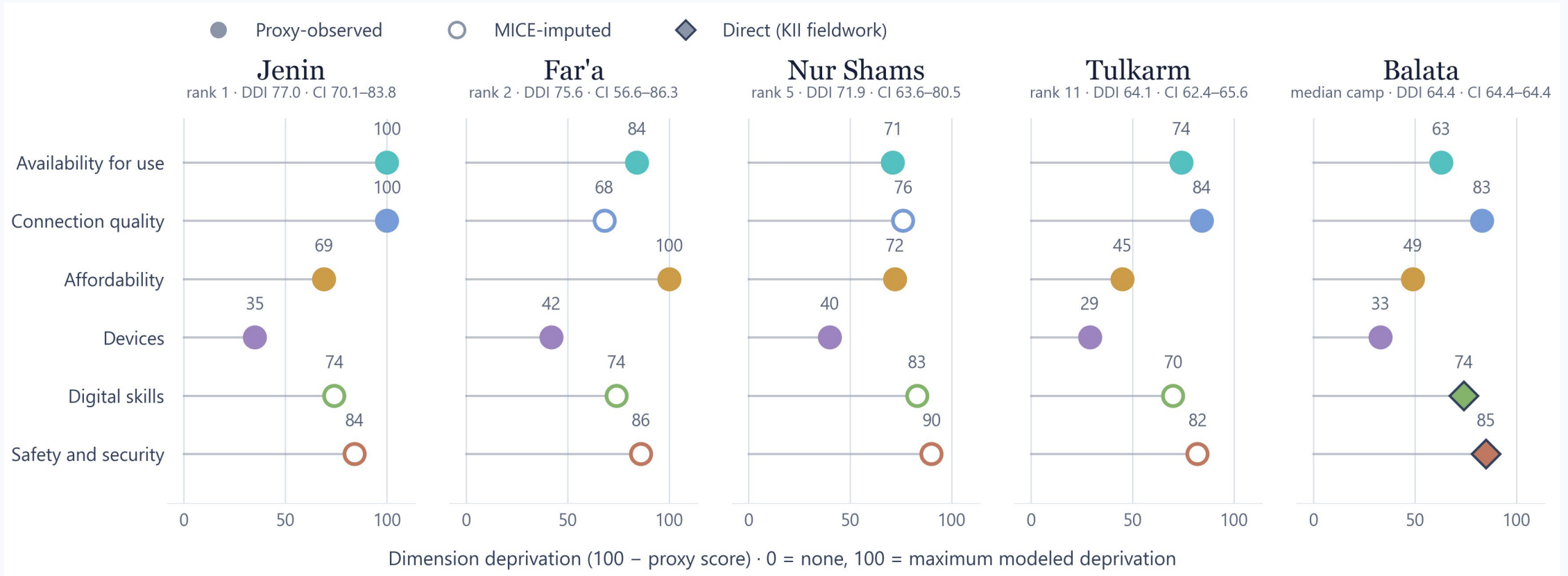
Tulkarm (64.1) sits beside Nur Shams (71.9); Balata, Askar and Camp No. 1 span 19.8 points within Nablus.

Exploratory project proxies — not official UNRWA geometry.

■ RESULTS

Dimension patterns — what drives the ranking

Four focus camps and the median camp — availability aligns closest with rank ($p = 0.863$).



Jenin saturates

Availability and connection quality reach 100; four of six dimensions push it to rank 1.

NextPlease DDI

Uncertainty visible up-rank

Far'a and Nur Shams rely on imputed connection quality; Far'a's affordability at 100.

Indicative proxy · not an official ITU measurement

Tulkarm: composition matters

Connection quality is 84, but affordability (45) and devices (29) pull it to rank 11.

Results · 09 / 18

What the results suggest for policy targeting

A two-part logic: prioritize where modeled deprivation is high, and verify where uncertainty is high.



PRIORITIZE + VERIFY

Jenin · Nur Shams

Ranks 1 and 5 · high modeled deprivation on stronger evidence



VERIFY FIRST

Far'a · Aqabat Jaber · Fawwar

Ranks 2–4 · HIGH uncertainty flags, low boundary confidence



CONTEXT MATTERS

Tulkarm

DDI rank 11 ≠ lower humanitarian need



CONTINUE MEASUREMENT

Camp No. 1 · Jalazone · Beit Jibrin

Ranks 17–19 · Jalazone and Beit Jibrin still carry HIGH uncertainty



THE TULKARM TEST

Rank 11 does not mean lower humanitarian need.

The DDI measures modeled digital deprivation — not humanitarian severity.

Verification-first policy pathways

Each pathway names the dimensions it touches and the evidence the DDI alone cannot supply.



1

FIELD VERIFICATION

Ground-truth the high-rank, high-uncertainty camps



Verify with: on-site audits



2

EMERGENCY CONNECTIVITY

Portable access and resilient backhaul for severe-band camps



Verify with: infrastructure status



3

REPAIR & CONTINUITY

Sequence repair where disruption and deprivation overlap



Verify with: outage and site data



4

DEVICE ACCESS

Device and charging support where deprivation is high



Verify with: household device data



5

DIGITAL SKILLS

Skills support where schooling is disrupted



Verify with: expanded fieldwork



6

RECURRING MEASUREMENT

Refresh sources and repeat the measurement



Verify with: recurring data access

■ EXPLORE THE OBSERVATORY

Explore the Digital Desert Index

19 camps · 6 dimensions · uncertainty attached

ddix.tech/explore

Public, no login. Open it on your phone.

Indicative proxy index · not an official ITU measurement



Live demo roadmap

Live at ddix.tech · frozen analytical dataset, 18 July 2026

1



Homepage

The Index Lens

2



Explore map

All 19 camps

3



Jenin

Rank 1 · DDI 77.0

4



Far'a

Uncertainty up front

5



Tulkarm

Why context matters

6



Data quality

Methodology & pedigree

Homepage — the Digital Desert Index Lens

National averages
can hide the
communities
furthest from
connection.

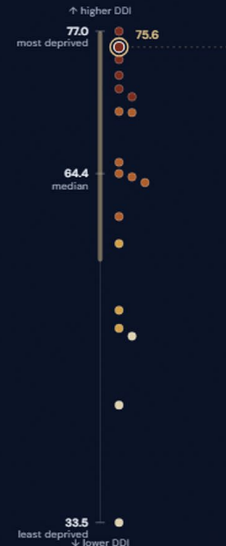
The **NextPlease Digital Desert Index** measures digital deprivation — camp by camp — across the 19 UNRWA-registered refugee camps of the West Bank, using the ITU Universal and Meaningful Connectivity framework. It is an exploratory, proxy-based research index: a way to see where the digital desert is likely deepest, stated with its uncertainty rather than despite it.

Explore the index

Read the methodology

DDI-V3 INDEX LENS
19 camps · 6 dimensions

2. Far'a — DDI 75.6



Far'a · Tubas

75.6 rank 2 of 19 **Severe** DDI ≥ 70

95% interval 56.6–86.3 across 20 imputations ·
High uncertainty

Low boundary confidence · proxy footprint, not
official geometry

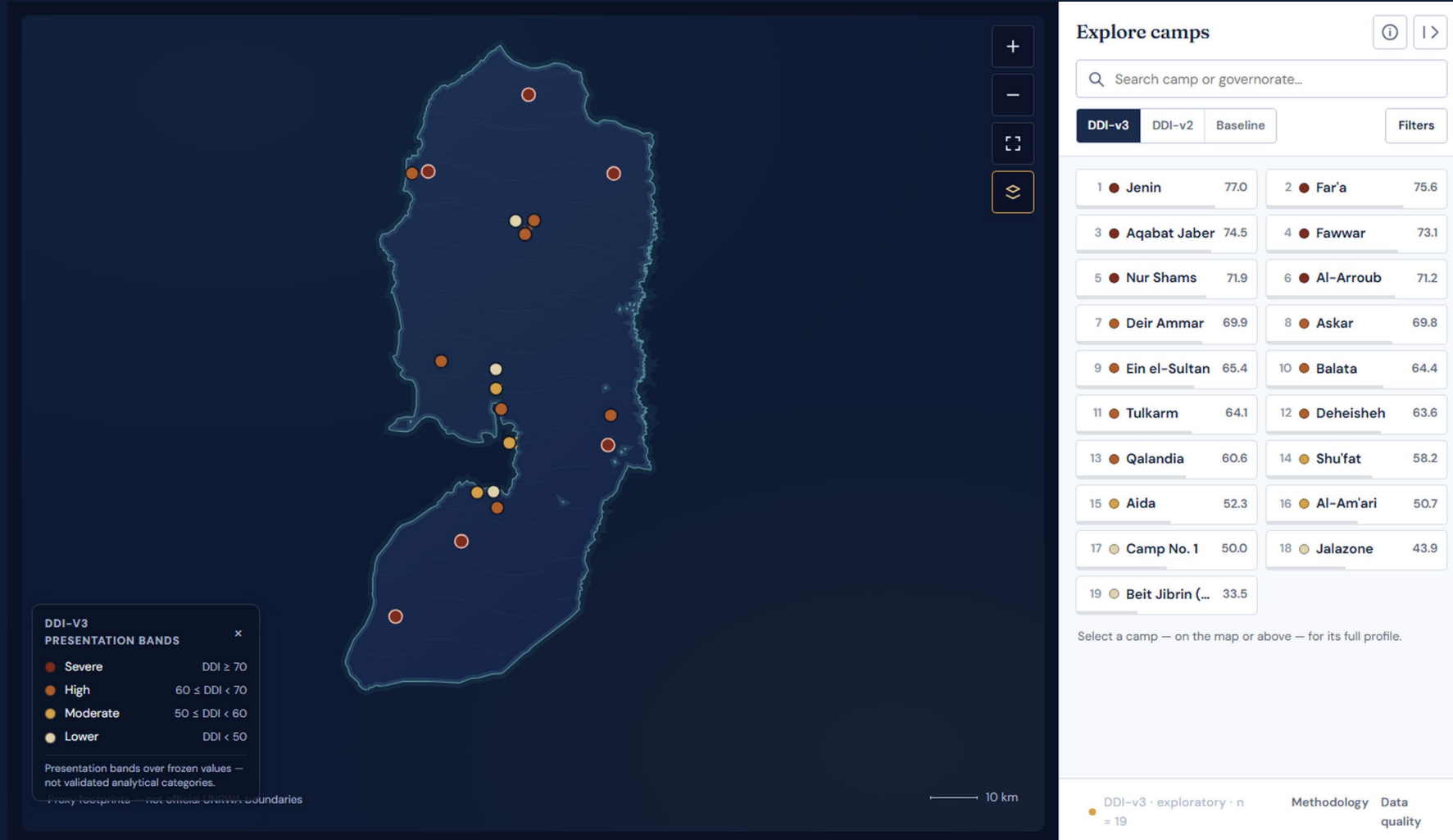
Universality	83.7	proxy
Performance	68.0	imputed
Affordability	100.0	proxy
Devices	41.8	proxy
Skills	74.5	imputed
Safety	85.9	imputed

Dimension deprivation (100 – UMC), 0–100. Ticks mark the 19–
camp median.

Higher DDI = greater modeled deprivation

Indicative proxy index

Explore map — all 19 camps



Camp profile — Jenin

Camps / Jenin

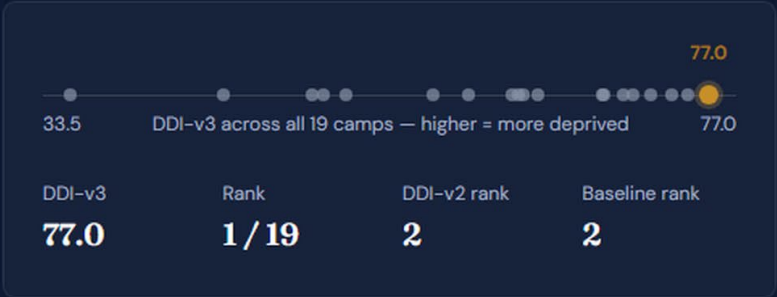
JENIN GOVERNORATE · WB-01

Jenin

Severe DDI ≥ 70 ● Medium boundary confidence

Under the DDI-v3 proxy specification, Jenin is the **1st most deprived** of the 19 camps, with a DDI of **77.0** (95% interval 70.1–83.8 across 20 imputations). The 19-camp median is 64.4.

● DDI-v3 · Indicative / exploratory · n = 19 · Not an official direct measurement



Rank 1 / 19 most deprived

DDI 77.0 modeled

70.1–83.8 95% interval

Rankings — uncertainty attached

● DDI-v3 · Indicative / exploratory · n = 19 · Not an official direct measurement

RANKINGS

The full ranking, with its uncertainty attached

Rank 1 is the camp with the highest modeled deprivation under the selected specification. Intervals, robustness flags and boundary confidence travel with every number — a rank without its uncertainty is not a finding.

READING RANK MOVEMENT

Movement between specifications shows sensitivity to how the index is measured — it is not evidence that a camp's conditions changed, and not proof that one specification is objectively correct.

DDI-v3 · current primary

DDI-v2 · retained

Baseline · benchmark

Accuracy-hardened proxy footprints; the current validated release.

Filter by name

e.g. Jenin

RANK ▲	CAMP	DDI	SCORE (0–100)	95% INTERVAL	V2 RANK	BASELINE RANK	DEEPEST CONSTRAINT	CONFIDENCE
1	Jenin Jenin	77.0		70.1–83.8	2 –1	2 –1	Universality	● Medium boundary confidence

Data quality & methodology

DDI-v3 · Indicative / exploratory · n = 19 · Not an official direct measurement

DATA QUALITY

Where this index is strong, and where it is honest about not being

Every value carries its pedigree: proxy, observed or imputed; every boundary carries a confidence grade; every release passes a validation sweep before promotion. This page is the map of the index's own limits.

PASSING CHECKS ≠ GROUND TRUTH

The validation results below verify internal consistency, archive integrity and honest labelling. They do not — and cannot — turn proxy data into direct measurement.

VALUE PEDIGREE

Direct, proxy, imputed — cell by cell

Of the 114 camp-dimension cells (19 camps × 6 dimensions), 77 are proxy or fieldwork values and 37 are MICE-imputed (m = 20).

Universality		0 imputed
Performance		7 / 19 imputed

Every score carries its evidence.

- ✓ Direct · proxy · imputed, cell by cell
- ✓ Boundary confidence graded
- ✓ Validation sweep before release



ddix.tech