CONNECTING CARE: STARLINK BOOSTING HEALTH SERVICE DELIVERY IN SOUTH SUDAN

Summary

A Starlink-powered connectivity pilot in 20 strategically selected health facilities is closing critical information gaps for surveillance, service delivery, mortality tracking and supply chains. Early results show large gains in IDSR timeliness and completeness, faster event verification, and improved DHIS2 performance. Scaling this approach would enable automated feedback loops for continual health-system improvement, adoption of ICD-11 across secondary and tertiary levels of care, and telemedicine that maximizes limited specialist capacity.

1. Health System Challenge

Health system constraints

- **Ultra-low connectivity:** Most facilities lack reliable internet and rely on paper or physically transporting¬¬¬ IDSR reports to nearby centers.

- **Severe access constraints:** Flooded roads and reliance on river transport cut off facilities for months.

- **Weak data flow:** IDSR and DHIS2 submissions arrive late—delaying outbreak detection, reporting, and response; this increases the risk of mortality and sustained transmission.

- **Service disruptions:** Stock-outs persist without real-time signals to trigger resupply.

- **Power limitations:** Little to no reliable electricity blocks digital tools and timely information flow.

Built on WHO Rails

- **National surveillance architecture:** WHO supports outbreak alert notification and verification using EWARS and weekly IDSR reporting of epidemic-prone diseases.

- **Mortality information:** Connectivity enables Medical Certification of Cause of Death (MCCOD) workflows and ICD-11 coding for timely, higher-quality mortality data.

- **Basic Package of Health and Nutrition Services (BPHNS):** WHO backs continuity of essential services and quality monitoring against BPHNS standards—even during access disruptions.

- **Health Cluster coordination and partner network:** WHO's coordination role accelerates uptake, troubleshooting, and scale in hard-to-reach areas.

- **Digital public goods and safeguards:** Interoperable tools, role-based access, and MoH data governance for security and sustainability.

Impact statement: Without reliable connectivity, data from high-risk, hard-to-reach facilities arrives late to guide public health action; WHO's comparative advantage is to embed connectivity within national surveillance and service delivery systems so that public signals translate into timely action as stipulated in the 7-1-7 framework.

1

September 2025 | *The development of these knowledge series is coordinated by Anabay Mamo, Strategic Health Information, WHO, South Sudan*

2. The Intervention

In April 2025, with World Bank support, the Ministry of Health and WHO launched a Starlink-powered connectivity pilot in 20 facilities prioritized for volume, remoteness, and epidemiological importance.

Key features

- High-speed satellite backhaul (Starlink) with solar-hybrid backup power for uninterrupted service.

- Integration with routine systems: IDSR and DHIS2.
- Site selection optimized for national health security: border points, displacement hubs, flood-prone corridors, and outbreak-prone zones.

3. Design & Methods

Evaluation design

- Quasi-experimental with matched comparison sites.
- **Treatment group:** 20 facilities with Starlink plus backup power; comparison group: 20 facilities of similar profile without connectivity.
- **Matching:** Propensity score matching on outpatient volume (>1,000/month), location type, accessibility index, flood risk, and baseline reporting performance.

- **Observation window:** Baseline (pre-pilot) vs. May 2025 (first full month of operation).
- **Primary estimand:** Average Treatment effect on the Treated (ATT) via Treatment–Control difference in the pilot period; within-site baseline deltas also computed.

4. Early Results—Month 1 (May 2025)

Indicator	Treatment	Control	Impact (T–C)	Within-T Δ	Relative Δ
IDSR Timeliness (%)	90%	64%	+26 pp	+28 pp	45%
IDSR Completeness (%)	92%	69%	+23 pp	+24 pp	35%
Detection-to-Alert (days, lower is better)	3	6	−3 days	−4 days	57%
DHIS2 Monthly Completeness (%)	88%	71%	+17 pp	+20 pp	29%

"pp" = percentage points. Relative Δ computed vs baseline within treatment sites; for days, reported as relative reduction.

5. Operational Outcomes & Enablers

- **EWARS alerts verification pace:** Treatment sites report median detection-to-alert of 3 days after vs. 6 days before (57% reduction vs. own baseline).
- **Accountability:** Improved timeliness/completeness enables earlier cluster review and targeted tele-supervision.
- **MCCOD & ICD-11 enablement:** Connectivity allowed onboarding of Medical Certification of Cause of Death and ICD-11 coding, improving mortality data quality and speed.
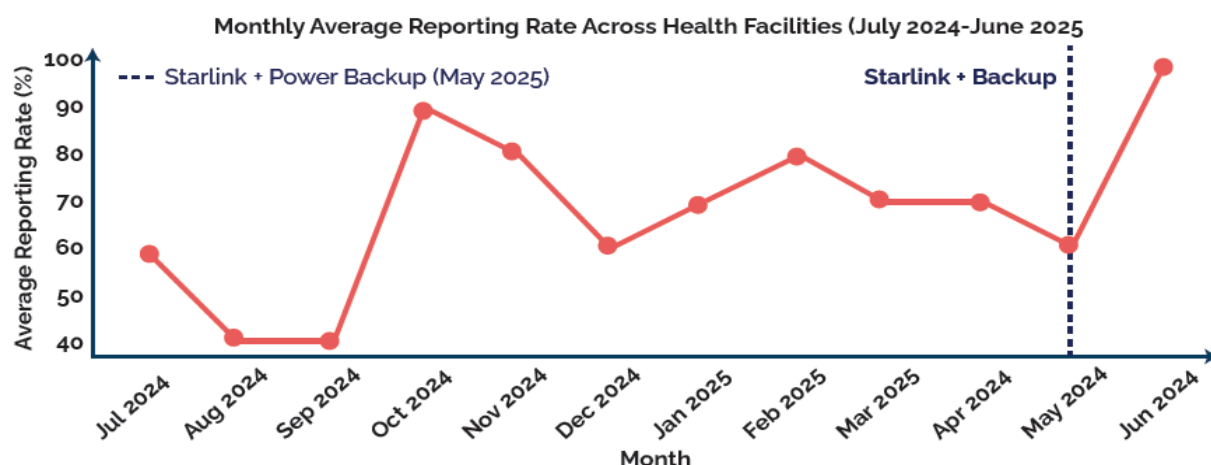
6. Sustainability & Risk Management

- **Power**: Solar-hybrid plus battery; surge protection; preventive maintenance schedule.
- **Security:** Device management, VPN, and role-based access with audit trails.
- **Costs:** Bandwidth pooling and service contracts with local support/spares.
- **Workforce:** Trained local technicians; clear governance for scale-up.

7. Limitations, Lessons Learned & Next Steps

- **Limitations:** Flooding, insecurity, and poor road networks slow installation and field support; ICT capacity and basic security vary across sites On-site Wi-Fi increased staff presence and use of digital tools; bandwidth spikes at month start cause short-term congestion.

- **Next:** partner-backed national rollout led by MoH, with precision targeting of high-risk/ high-volume, flood- and border-affected facilities using real-time IDSR/DHIS2 signals.

Monthly Average Reporting Rate Across Health Facilities (July 2024-June 2025

- - - Starlink + Power Backup (May 2025)

Starlink + Backup

Pictorial

Starlink installation

World Bank–supported pilot • Ministry of Health (MoH) & WHO • April–May 2025