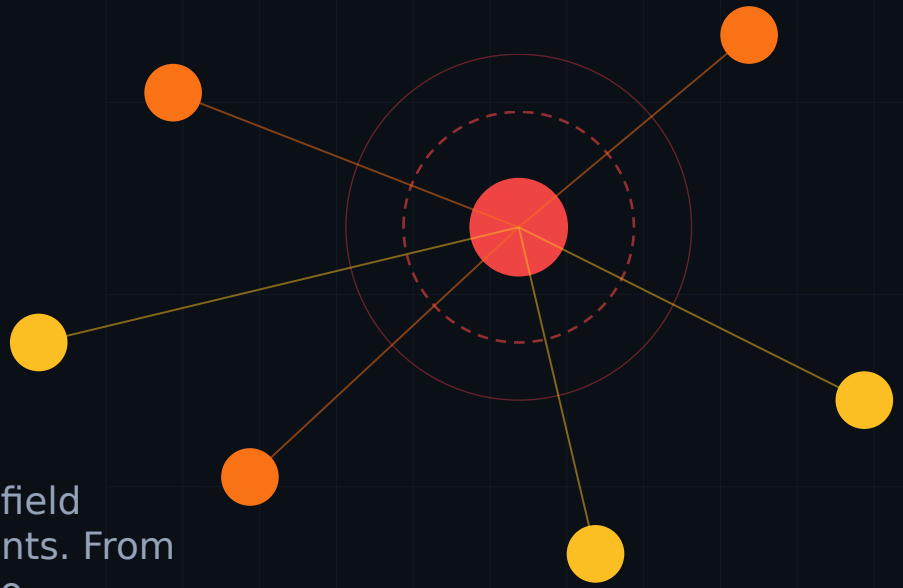
VITAALERT HEALTH GRID

Epidemic Intelligence Infrastructure



AI-powered operational intelligence and field coordination for low-resource environments. From single community-health-worker report to coordinated continental response — in days, not weeks.

PROTOTYPE · 2026

MINISTRIES OF HEALTH · AFRICA CDC · WHO · NGO RESPONSE PARTNERS

01 · THE PROBLEM

Africa’s epidemic response gap, in three numbers.

14–21d

Median lag from index case to outbreak alert in low-resource settings (synthesis of WHO IDSR + post-event reviews).

<72h

Detection target needed to contain a Filovirus or Mpox outbreak before exponential phase (WHO operational guidance).

3.5×

Growth in zoonotic spillover events since 2000, driven by climate, urbanization, migration (peer-reviewed estimates).

The infrastructure to close this gap doesn’t exist yet. Existing tools are paper-based, web-only, or hospital-centric — none turn field reports into a forecast of where the outbreak is heading or coordinate the response across borders. None are AI-augmented, offline-first, and built for community health workers operating across borders.

02 · THE PLATFORM

Four operational layers. Built mobile-first, AI-augmented, offline-resilient.

FIELD LAYER

Offline-first reporting

Android app for community health workers. Suspected case form, symptoms checklist, exposure history, GPS, photo + voice notes. Stores locally, syncs when connectivity returns. Multilingual (EN/FR/SW).

INTELLIGENCE LAYER

AI risk + cluster engine

Risk scoring with full explainability. Cluster detection from contact graph density. Super-spreader identification. Cross-border movement inference. Counterfactual modeling for intervention impact.

OPERATIONS LAYER

Mission-control dashboard

Live geospatial outbreak view. Contact transmission network. Resource stress modeling (PPE, beds, clinics). Cross-border activity tracking. Timeline replay for retrospective analysis.

COORDINATION LAYER

Multi-stakeholder workflow

AI operational recommendations with approval workflow. Cross-border bilateral coordination. WHO/Africa CDC notification pathways. Donor visibility dashboards. Audit trail for IHR (2005) reporting.

03 · DISEASE MITIGATION

Six intervention points across the outbreak

SPILLOVER DETECTION

AI risk score in <3s

Symptoms, exposure history, and outbreak proximity combined into CRITICAL-to-LOW score at CHW submit. No connectivity required.

COMMUNITY SPREAD

Contact graph clustering

Household, funeral, and market exposure events mapped in real-time. Cluster density scoring flags escalation risk before hospital presentation.

CROSS-BORDER MOVEMENT

IHR alert in <1h

Cell-tower colocation and cargo manifest cross-referencing detects border crossings. IHR (2005) bilateral notification triggers automatically.

CLUSTER AMPLIFICATION

Super-spreader detection

Concentration index ≥ 0.30 flags high-density nodes. Retrospective interview and market closure assessment triggered in under 1 hour.

RESOURCE SATURATION

7-day supply forecast

PPE, isolation beds, and clinic capacity stress-modeled 7 days ahead. ETU utilization alerts route to nearest available response infrastructure.

COORDINATED RESPONSE

Ring vax + IPC deploy

Ranked interventions proposed with counterfactual impact modeling. Human approval gate ensures AI augments — never replaces — the operator.

DISEASE MODES: EBOLA · MARBURG · CHOLERA · MPOX · LASSA FEVER

DAY 1 APR 16

DETECTION

A community health worker spots an index case.

- CHW in Kasenyi (DRC, Albertine corridor) submits a suspected case: fever 39.4°C, hemorrhagic symptoms, recent funeral attendance.
- Report is captured offline on Android, geo-tagged, time-stamped, and queued to sync.
- VitaAlert's AI risk engine scores the case CRITICAL within seconds — before the report reaches the cloud.
- Alert routed to district supervisor, MoH emergency line, and WHO HCID pathway via IHR (2005).

< 3 s

Time from CHW submit to CRITICAL risk score and HCID-pathway alert. No connectivity required.

AI EXPLAINABILITY

Risk score driven by 3 signals: hemorrhagic presentation (+44), funeral within incubation window (+31), proximity to historical Ebola corridor (+16).

DAY 5 APR 20

CROSS-BORDER

The outbreak crosses an international border.

- A trader (Case 0022) who visited Mbeni market crosses the Mt. Speke corridor into Uganda 96 hours before symptom onset.
- VitaAlert cross-references cell-tower colocation + cargo manifests against the outbreak contact graph.
- A secondary case appears in a Bunia guesthouse 48h later. Bilateral coordination opens.
- IHR (2005) cross-border notification is triggered automatically. UGA MoH, Africa CDC, and WHO AFRO are notified within the hour.

AI EXPLAINABILITY

Cell-tower colocation + manifested cargo records place subject at Mbeni market 96h before symptom onset, then at Speke checkpoint 72h prior. Triggers automatic IHR notification.

96h

Lead time on cross-border detection — before the index trucker even developed symptoms.

DAY 7 APR 22

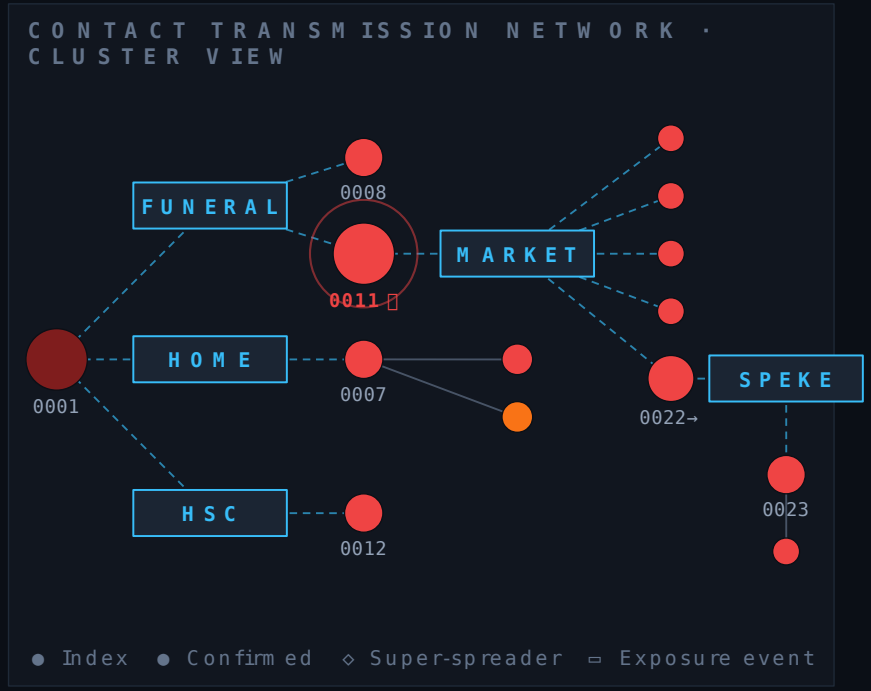
SUPER-SPREADER DETECTION

One click reveals weeks of manual contact tracing.

- AI flags Case 0011 — a Mbeni market vendor — as a super-spreader: 11 downstream exposures over a 96-hour symptomatic-but-ambulatory window.
- Contact graph is rendered instantly from CHW reports, exposure events, and cross-checked with cell-tower colocation data.

AI EXPLAINABILITY

11 of 23 secondary cases trace within one hop of subject. Concentration index 0.48 (> 0.30 threshold). Triggers retrospective interview + market closure assessment within 1h of detection.



DAY 10 APR 25

OPERATIONAL DECISION SUPPORT

VitaAlert proposes. Human operators decide.

- At Day 10, with 64 active cases across 5 districts, VitaAlert's counterfactual engine proposes ranked actions — each with rationale, ETA, and human approval gate.
- AI augments, never replaces, the operator. Every recommendation cites the data, the model confidence, and the projected impact.

68%

Reduction in projected Day-14 case load when AI-recommended ring vaccination + corridor IPC is approved (95% CI 54–79%).

CRIT — APPROVED · 12H

Activate Goma-N Forward Operating Base

64 cases · 5 districts · ETU at 91%. Goma-N optimal node (road + airstrip + power + 4G).

CRIT — EXECUTED

Expand Bunia ring vaccination · +1,000 doses

Bunia at 14 cases, UGA Tier 1 alert. Ring extension closes cross-border transmission window.

HIGH — APPROVED · 72H

Deploy +18 isolation beds · Mbeni ETU expansion

Current utilization 91%. Projected demand 110+ beds by Day 14 without expansion.

MED — ACTIVE

Sustain Speke + Lake Albert corridor watch

0 new corridor cases in 96h, but max incubation extends 21d post-last exposure.

DAY 14 APR 29

CONTAINMENT

From one CHW phone report to coordinated response in 14 days.

- Reff falls below 1 and stays there for 72 hours. The outbreak enters decay phase.
- 86% of cases are under monitored isolation. Ring vaccination has reached 1,840 doses across DRC and UGA.
- AI-led after-action review begins immediately. Lessons feed back into the predictive risk surface for Q3.
- Outbreak metadata, contact graph, resource burn, and decision log are exportable for IHR (2005) reporting.

0.84

Day-14 effective reproduction number, sustained below 1 for 72h. Outbreak in containment phase.

AI EXPLAINABILITY

Decline driven by ring vaccination (412 → 1,840 doses), Mbeni ETU expansion, market closure (Day 8), and CHW-led safe-burial protocols. 86% of cases under monitored isolation.

09 · FIELD RESPONSE NETWORK

VitaAlert connects to the infrastructure that already exists on the ground.

MSF — MÉDECINS SANS FRONTIÈRES

3 Active ETUs · Ebola · Marburg · Lassa

Beni (DRC), Kenema (SL), Conakry (GN) · ~50–70 beds/ETU · Coordination: emergencies@msf.org · +32 2 474 74 74

● ACTIVE 2026

WHO / AFRICA CDC — GOARN NETWORK

47 Countries · All HCID Pathogens

WHO GOARN + Africa CDC RCHCS (5 regional hubs). IHR focal point coordination. · afro-ihr@who.int · GOARN Ops: +41 22 791 2111

● ACTIVE 2026

IFRC / RED CROSS — AFRICA ZONE

Community Surveillance + ETU Support

National Societies active in DRC, Guinea, Sierra Leone, Nigeria. Cholera, Ebola, Mpox response. · disaster.info@ifrc.org · Geneva EOC

● ACTIVE 2026

US CDC / AFRICA FELTP NETWORK

25+ Countries · Field Epidemiology

Field Epidemiology Training Programs in 25+ African nations. Rapid response + capacity building. · CDC EOC (24/7): +1 770 488 7100

● ACTIVE 2026

NIGERIA CDC — NPHCOC LAGOS

Lassa · Mpox · Cholera · 36-State Network

National Public Health Emergency Ops Center. Lassa Fever primary mandate. 36-state real-time surveillance network. · info@ncdc.gov.ng · +234 800 9999 807

● ACTIVE 2026

DRC MOH — INRB / NORTH KIVU ETU

14 Ebola Outbreaks · Mpox Clade I · Cholera

Institut National de Recherche Biomédicale. National reference lab + North Kivu ETU network. 2026 Clade I surveillance ongoing. · sante.gouv.cd

● ACTIVE 2026

47 COUNTRIES · 200+ FIELD UNITS · 6 COORDINATION PATHWAYS · ALL CONNECTABLE VIA VITAALERT API

10 · OUTBREAK HISTORY

The intelligence was always there. The infrastructure to act on it wasn't.

EBOLA · W. AFRICA 2014–16

28,616

11,310 deaths · CFR 40%

3+ months to international alert. Community transmission undetected for weeks.

↗ Day 1 detection vs. 3-month lag

EBOLA · DRC 10TH 2018–20

3,481

2,299 deaths · CFR 66%

7–14 day district detection gap. Cross-border spread into Uganda detected late.

↗ 96h cross-border lead time

MPOX CLADE I · DRC 2023–25

14,000+

500+ deaths · CFR 3.5%

Community detection gap weeks in rural zones. CHW network absent in epicentre.

↗ Offline CHW closes rural gap

LASSA FEVER · NIGERIA 2019

839

171 deaths · CFR 20%

Hospital-centric detection. Community lag 14+ days. All 36 states affected.

↗ Community detection in <72h

CHOLERA · DRC 2023

17,000+

450+ deaths · CFR 2.6%

Cross-border spread via Lake Kivu corridor. Cross-referencing delayed response.

↗ Corridor mobility tracking

14–21d

Median outbreak detection lag in low-resource settings without AI operational-intelligence infrastructure

$4.3B

Estimated cost of West Africa Ebola response 2014–16. Moving faster than the outbreak is not humanitarian only — it is economically irreversible.

11 · WHY NOW

Three forces converge. The window to build this infrastructure is open.

ACCELERATING SPILLOVER

Spillover is no longer rare.

Zoonotic spillover events have more than doubled since 2000. Climate, urbanization, and ungoverned spaces are widening the human–wildlife interface across sub-Saharan Africa.

INSTITUTIONAL MANDATE

WHO + Africa CDC align.

WHO's IHR (2005) review prioritises sub-72h detection. Africa CDC's 2063 vision is built on continental surveillance interoperability — VitaAlert is purpose-built for that operating model.

OPERATIONAL FIT

The response architecture exists.

The 2026 Africa CDC–WHO continental response plan, national incident-management structures, and IHR (2005) mechanisms are active now. VitaAlert plugs into them as the last-mile field-intelligence and coordination layer — it does not replace them.

INTEROPERABLE WITH

DHIS2 | Go.Data | IHR (2005) | WHO GOARN | AFRICA CDC | NATIONAL IMS

12 · THE PARTNERSHIP

Pilot deployment in the DRC–Uganda Albertine corridor.

GEOGRAPHY

DRC · Uganda Albertine corridor

Real Ebola/Marburg recurrence zone. Active WHO/Africa CDC operational footprint. High-impact, demonstrable epidemiology. Cross-border by design.

TIMELINE

18-month phased deployment

M0–3: ministry alignment + CHW network mapping. M3–9: district pilot, AI tuning, operator training. M9–18: corridor scale-up, evaluation, AAR.

PARTNERS

MoH + WHO + Africa CDC + NGOs

DRC + UGA Ministries of Health. WHO AFRO. Africa CDC. NGO field partners (MSF, IRC, Red Cross). Academic eval partner (TBD).

WHAT WE ASK OF PARTNERS

Co-design + one pilot health zone

A ministry or NGO sponsor, access to one accessible health zone, alignment with your incident-management structure and data-governance rules, and a named counterpart. VitaAlert supplies the platform, training and

Built for the next outbreak — wherever and whenever it begins.