NOVANTUM
ADVISORY GROUP

PRACTITIONER ARTICLE

Seven Hours to Detect, Sixty-Four Days to Respond: The 7-1-7 Benchmark's Response Bottleneck

Between 2015 and 2025, the global health community invested heavily in digital disease surveillance, DHIS2, the Africa CDC Event Management System, the 7-1-7 response benchmark, AI-augmented triage. The assumption underlying all of it was that faster detection produces faster response. A single dataset from Sierra Leone falsifies this assumption directly and quantifiably: across 16 outbreak events from December 2020 to March 2023, DHIS2 compressed detection-to-notification latency to 0.3 days, approximately seven hours. Average time to effective response was 64 days. The information loop is working. The response system is not. The bottleneck is not data. It is the absence of pre-authorized decision authority at the level where the data is received. This article argues that the surveillance investment community is solving the wrong problem, names what the correct problem is, and specifies what three countries did differently.

7 hrs

Average detection-to-notification latency, Sierra Leone DHIS2 (2020–2023)

64 days

Average time to effective response, same system, same outbreaks

THE INVESTMENT DECADE: WHAT WAS BUILT AND WHAT IT WAS SUPPOSED TO DO

The 2014-2016 West Africa Ebola epidemic was, among other things, an information failure. Detection in Guinea initially took up to seven days at outbreak onset. External capacity-building reduced this to approximately one day; an improvement of more than 85% in detection speed attributable in part to strengthened local laboratory and surveillance infrastructure. The lesson the global community took from Ebola was specific: detect faster, notify faster, respond faster. The architecture built in the decade that followed was built around that lesson.

Between 2016 and 2025, the investments were substantial. The WHO Health Emergencies Programme, established in 2016, provided technical support to member states for surveillance capacity across the African region. DHIS2, the open-source District Health Information Software platform expanded from a handful of countries to operational deployment in 76 countries globally, 48 of them in Africa, running Integrated Disease Surveillance and Response (IDSR) systems and connecting facility-level reporting to national dashboards in near real-time. The Africa CDC launched a DHIS2-based Event Management System in June 2020. The Joint External Evaluation tool, the primary mechanism for assessing IHR core capacity compliance was used to benchmark surveillance system readiness across member states. The 7-1-7 framework emerged as the international benchmark: detect a potential health threat within seven

days of its start, notify national authorities within one day, respond effectively within seven days of notification.

The results of this investment decade, measured at the detection and notification stages, are real and significant. A prospective evaluation of the Africa CDC Event Management System (Kyeng et al., PLOS Digital Health, 2024), tracking 416 events across all 55 African Union member states from 2020 to 2022, found overall timeliness improving from 11% to 44% in two years; a fourfold improvement. Alert notification timeliness improved from 10% to 73% over the same period. Tanzania's Ministry of Health, building on a DHIS2 IDSR system launched in 2021, introduced an AI-based alert triage system in 2024 that reduced average triage time from 36-48 hours to near-instantaneous and successfully processed 85% of a backlog of more than 15,000 untriaged alerts, with 23% warranting further investigation; a signal rate that had previously been invisible (Summey E., DHIS2 Impact Stories, March 2025).

The infrastructure investment worked. Detection got faster. Notification got faster. And then, in Sierra Leone, a 7-1-7 evaluation measured what happened next and found that the finish line the entire investment decade was aimed at was **not the finish line that mattered.**

THE SIERRA LEONE DATA: SEVEN HOURS TO DETECT, SIXTY-FOUR DAYS TO RESPOND

The Sierra Leone Event-Based Surveillance Unit, in collaboration with JHPIEGO and US CDC, evaluated DHIS2-based outbreak response across 16 events from December 2020 to March 2023. The diseases covered included anthrax, Zika, chikungunya, Lassa fever, and chemical food poisoning, a representative spread of the outbreak types a fragile-state health system must manage. The 7-1-7 performance data is as follows (Swaray Lengor, DHIS2 Annual Conference, March 2024):

METRIC	EVENTS	RATE
Detected within 7 days of start	11 of 16	69%
National team notified within 1 day of detection	14 of 16	88%
Initiated epidemiological investigation	16 of 16	100%
Effective response mounted within 7 days of notification	10 of 16	63%
Average time: detection to notification	—	0.3 days (~7 hours)
Average time: notification to effective response	—	64 days

Read the first two rows in isolation and the Sierra Leone DHIS2 system looks like a near-perfect surveillance architecture. Detection is within the 7-day window in 69% of cases. Notification reaches national level in seven hours in 88% of cases. 100% of events were investigated. By the standards of the 7-1-7 framework, the primary international benchmark, this is a high-performing system.

Now read the last row. Effective response, the action that contains the outbreak, treats the cases, protects the community, took an average of 64 days from the point of notification. Against the 7-1-7 benchmark target of response within seven days of notification, the system achieved its response target in approximately 63% of events. The average time to effective response across all 16 events was more than nine times the benchmark.

The system is not failing at **detection**. It is failing at **response**. And the reason is not that the information arrived too late. It is that the governance architecture the information arrived into had no pre-delegated authority to act.

This is the authorization gap. It is the interval between the moment a verified alert is generated and the moment a designated official has the legal authority, the pre-positioned resources, and the operational mandate to initiate a specific response action. In Sierra Leone, that interval was 64 days. In the community where the outbreak was occurring, those 64 days were not a data problem. They were a governance problem.

THE AUTHORIZATION GAP DEFINED: A GOVERNANCE PROBLEM, NOT A TECHNOLOGY PROBLEM

The 7-1-7 framework, as currently designed, treats response as the natural consequence of detection and notification. The implicit model is linear: if you detect faster and notify faster, you respond faster. The Sierra Leone data establishes that this model is wrong. Response speed is not determined by information speed. It is determined by decision authority, specifically by whether a designated official at the level where the alert is received has the pre-authorized power to initiate a specific set of response actions without routing the decision back through a central authorization chain.

Pre-authorized response protocols are standing orders that specify, in advance of any outbreak event, which officials have authority to initiate which actions upon receipt of which alert thresholds. They are not a digital system. They are not a training program. They are a governance document, a formal delegation of decision authority to subnational levels, specifying the conditions under which that authority activates. Their absence is the operational explanation for the 64-day gap.

Without pre-authorized protocols, the response pathway after notification typically runs as follows: the national surveillance team receives the alert; verifies it through internal review; escalates to ministry level; ministry convenes a technical committee; the technical committee recommends a response; the recommendation is reviewed by senior ministry leadership; a response directive is issued; the directive reaches the district level; the district marshals available resources; response activities begin. Each of those steps has a decision gate. Each decision gate has a holder. Each holder is operating within an institutional culture that does not reward unilateral action, particularly when laboratory confirmation, which took an average of 64 days in the Sierra Leone cases that did not meet the 7-day response benchmark has not yet been achieved.

WHAT PRE-AUTHORIZED PROTOCOLS SPECIFY

Trigger: the specific alert threshold (e.g., two suspected Lassa fever cases in one district within 14 days). **Authority:** the designated official who may act (e.g., district health officer). **Action set:** the specific permitted actions (e.g., stockpile release, isolation facility activation, specimen transport, community containment messaging). **Resource pre-positioning:** what is staged in advance and where. **Escalation:** when and how central authority is notified (notification is not authorization; these are distinct pathways)

The absence of pre-authorized protocols is not unique to Sierra Leone. The Somalia IDSRS evaluation, the most comprehensive longitudinal documentation of IDSR implementation in an active humanitarian context found that technical components of surveillance advanced rapidly (79% progress on information technology, 77% on guidance and tools) while financing achieved only 15% progress. Governance authorization was not separately measured, but the pattern is consistent: the digital infrastructure is built; the decision architecture to act on it is not.

WHAT RWANDA, SOUTH AFRICA, AND UGANDA DID DIFFERENTLY

The contrast with countries that pre-delegated response authority in their district-level COVID-19 plans is instructive. Rwanda entered the COVID-19 pandemic with 30 administrative districts, each with a District Health Management Team exercising real resource management authority. When the first confirmed case was identified on March 14, 2020, all 30 districts activated District Command Posts and Rapid Response Teams under mayoral leadership within days — not because they waited for central authorization, but because they already had it. Pre-existing protocol specified what district-level officials could do, when they could do it, and what resources they could deploy. The result: service disruptions of 4–5% across key maternal and child health indicators during COVID-19, against a WHO global pulse survey mean of 50% (Amberbir et al., Annals of Global Health, 2024; WHO First Pulse Survey, 2020).

Rwanda's performance advantage is not primarily a digital infrastructure story. DHIS2 was operational in Rwanda before the pandemic, and the eIDSR system provided real-time syndromic and case-based reporting. But the same digital infrastructure exists in many countries that did not achieve Rwanda's outcome. The variable that explains the difference is decision authority: Rwanda's district health teams

were not waiting for notification to reach a central ministry and return as a directive. They had pre-delegated authority to initiate response actions upon defined alert conditions, and they had rehearsed that authority through prior outbreak preparedness cycles with Ebola, Marburg, H1N1. Information arrived, and the system acted. The information and the authority to act on it were held at the same level.

South Africa and Uganda demonstrated similar patterns. Decentralizing COVID-19 response to subnational and district levels through provincial incident management teams in South Africa and existing district surveillance teams and task forces in Uganda enabled central governments to focus on strategy and resource mobilization rather than operational authorization of individual response actions. The critical enabling factor, documented across both settings, was the pre-existence of district-level institutional structures with genuine decision authority, not the novelty of the response protocols themselves.

THE REFRAME: THE 7-1-7 BENCHMARK IS MEASURING THE WRONG FINISH LINE

The 7-1-7 framework is the correct direction. Faster detection saves lives. Faster notification enables faster mobilization of resources. These are real benefits. The problem is that the framework defines its third benchmark; effective response within seven days of notification as a target without specifying the governance pre-conditions required to achieve it. Treating response speed as a function of notification speed is equivalent to treating the speed of water through a pipe as a function of inlet pressure while ignoring whether the outlet valve is open.

The surveillance investment community has spent a decade and substantial donor resources, improving inlet pressure. The Sierra Leone data shows the outlet valve. Detection in seven hours; response in 64 days. The valve is closed. And no additional investment in detection speed, notification infrastructure, AI-augmented triage, or DHIS2 capacity will open it.

What opens it is a governance decision. A member state, or a subnational authority, or a humanitarian coordination body decides in advance — before any outbreak, in a formal document with legal standing, which official has authority to initiate which action under which conditions. That decision costs almost nothing relative to the cost of a digital surveillance system. It requires no hardware, no connectivity, no software licensing. It requires political will and institutional clarity. And it is the missing component in the response architecture of the majority of the systems the investment decade built.

The implication for program designers is specific. The next generation of surveillance investment programs should require, as a precondition of funding, the development and rehearsal of pre-authorized response protocols at district level. The 7-1-7 benchmark should be amended to measure not only detection, notification, and response, but response authorization time. The interval between verified alert and the moment a designated official initiates the first authorized response action. Until that interval is measured, the investment community will continue to improve the half of the pipeline that is already working and fund its way around the governance gap that is not.

The surveillance infrastructure built between 2015 and 2025 is real, valuable, and in many contexts life-saving. The Africa CDC timeliness trajectory from 11% to 44% overall in two years, alert notification from 10% to 73% is genuine progress. Ethiopia's DHIS2-linked improvements in institutional delivery rates (+181%) and pneumonia outcomes (−524% against counterfactual) demonstrate what happens when real-time data reaches practitioners with authority to act on it (Zerfu et al., Archives of Public Health, 2025). These are not wasted investments. They are investments that have reached the authorization bottleneck and stopped there.

Seven hours to detect. Sixty-four days to respond. The information is not the problem.

REFERENCES

1. Swaray Lengor. "Outbreak response monitoring and evaluation through DHIS2 using the 7-1-7 target in Sierra Leone." Sierra Leone Event-Based Surveillance Unit / JHPIEGO / US CDC. DHIS2 Annual Conference, March 2024. https://community.dhis2.org/t/outbreak-response-monitoring-and-evaluation-through-dhis2-using-the-7-1-7-target-in-sierra-leone/57709
2. Kyeng M, Salyer SJ, Mankga C, et al. "Establishing an early warning event management system at Africa CDC." PLOS Digital Health, 2024; 3(7):e0000546. https://pmc.ncbi.nlm.nih.gov/articles/PMC11230544/
3. Summey E. "AI-Driven Alert Triage with DHIS2 Transforms Disease Surveillance in Tanzania." DHIS2 Impact Stories, March 2025. https://dhis2.org/ai-driven-alert-triage-tanzania/
4. Zerfu TA, Asressie M, Tareke AA, et al. "Contributions of DHIS2 to maternal and child health services in Ethiopia." Archives of Public Health, 2025; 83:e180. https://pmc.ncbi.nlm.nih.gov/articles/PMC12220602/
5. Amberbir A, Sayinzoga F, Mathewos K, et al. "Maintaining Delivery of Evidence-Based Interventions to Reduce Under-5 Mortality During COVID-19 in Rwanda." Annals of Global Health, 2024; Vol. 90, No. 1. https://pmc.ncbi.nlm.nih.gov/articles/PMC11276474/
6. World Health Organization. "In WHO global pulse survey, 90% of countries report disruptions to essential health services since COVID-19 pandemic." WHO News, 31 August 2020. https://www.who.int/news/item/31-08-2020-in-who-global-pulse-survey-90-of-countries-report-disruptions-to-essential-health-services-since-covid-19-pandemic
7. Ssendagire S et al. "Somalia IDSRS-DHIS2 integration and implementation." Frontiers in Public Health, 2023. https://pmc.ncbi.nlm.nih.gov/articles/PMC10539911/
8. Bhattacharya A, Amberbir A, Sayinzoga F, et al. "Evidence of health system resilience in Rwanda and Bangladesh during COVID-19." Journal of Global Health, 2024; 14:05023. https://pmc.ncbi.nlm.nih.gov/articles/PMC11223753/
9. European Society of Medicine. "Health Emergencies in Sub-Saharan Africa: Strategies and Challenges." 2026. https://esmed.org/health-emergencies-in-sub-saharan-africa-strategies-challenges/
10. Habimana P, et al. "Impact of COVID-19 on Rwanda's Health Sector." AERC Working Paper COVID-19_013, African Economic Research Consortium, 2021. https://aercafrica.org/old-website/wp-content/uploads/2021/10/AERC-Working-Paper-COVID-19_013.pdf