Implementation and Lessons Learned From a Novel All-hazards Event-based Surveillance Pilot Program in Haut Katanga Province, the Democratic Republic of the Congo (DRC)

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Background

- The COVID-19 pandemic revealed the urgent need for countries to build and implement more robust surveillance systems to limit the spread of infectious diseases.
- In 2019, event-based surveillance (EBS) was included in WHO's Integrated Disease Surveillance and Response framework, the standard for African national surveillance systems.
- EBS is an organized approach to collect informal health information to rapidly detect and respond to events of public health importance.
- Although community-based surveillance was part of the Democratic Republic of the Congo's (DRC's) surveillance strategy, there was no formal protocol for EBS implementation.
- The Centers for Disease Control and Prevention (CDC) funded RTI International to conduct a 5-year Global Health Security (GHS) project in the DRC in 2020.
- The planning and implementation of EBS took place in five pilot health zones (HZs), two urban and three rural, in Haut Katanga province between 2020 and 2023 (**Figure 1**).

Figure 1. Map of DRC, with Haut Katanga Province Highlighted in Red

Aims

- To strengthen the epidemiological surveillance system through a system of early warning detection and verification of signals at the community level.
- To strengthen informal mechanisms for identification of health events and the role of community actors within the formal health system, to improve rapid detection and response to outbreaks.

Objectives

- Strengthen knowledge of EBS in the community in identified HZs of Haut Katanga province.
- Implement an EBS pilot project in the community in identified HZs of Haut Katanga province.

Methods

- Conducted a rapid evaluation of the existing community event-based surveillance capabilities in the five HZs.
- Held meetings with the national Directorate of Epidemiologic Surveillance (DSE) to establish support for the launch of EBS activities in Haut Katanga.
- Defined seven signals to trigger notification, triage, and verification of events (**Figure 2/Figure 4**).
- Developed and validated the implementation plan, including reporting structure (**Figure 3**), with CDC, DSE, and Provincial Health Office (DPS) Haut Katanga.
- A verified signal must respond to the following questions:
  - Is the signal a threat to public health?
  - Was the information reported by a reliable source? Has it already been reported?
  - Is the information accurate?
  - Does the information meet the criteria for one or more of the seven signals (**Figure 3**)?
- Developed an event notification form in DHIS2. The DHIS2 electronic surveillance system is also supported by CDC in Haut Katanga province.
- Drafted and validated EBS training modules and facilitator guides. Developed EBS sensitization tools (e.g., consultation card) (see **Figure 4**) and flip chart, and reporting tools (e.g., alert notification form, signal register, event log, and event form in DHIS2).
- Using cascade methodology, trained national- and provincial-level head trainers who then trained health nurses at the health facility level, heads of Community Animation Cell (CAC)/community development committees, and community key informants on EBS concepts and implementation (**Photo 1**).
- Held briefings with community health volunteers (rélais communautaires/RECO in French) and additional informants.
- Conducted joint supervision visits with the DSE, DPS, and CDC.
- Collected and analyzed supervision data and data from DHIS2 to evaluate the pilot.

Figure 2. EBS Signals 1–7

1	A single person with a warm body, malaise, and bleeding from an unknown origin.
2	One child less than 15 years old with a sudden onset of weakness of the limbs not due to injury.
3	Any person who becomes sick after contact with a sick or dead animal.
4	A sudden death in the community in an apparently healthy person.
5	Two or more persons presenting in the same location with the same symptoms within 7 days.
6	Illness or death in members of the community after inhalation of polluted air or ingestion of food or water contaminated with toxic residues.
7	Other signal that may constitute a public health threat.

Figure 3. EBS Reporting Structure

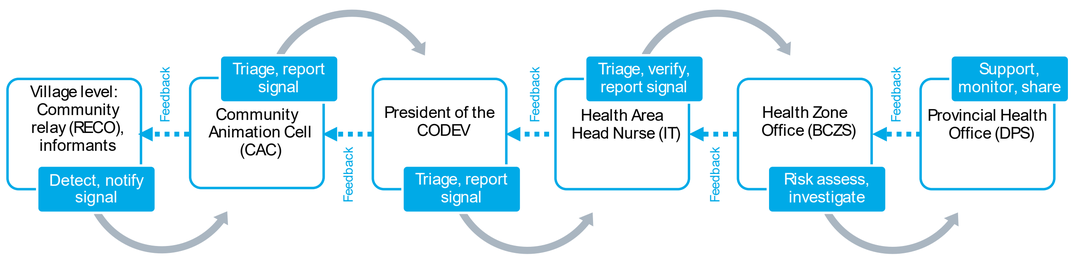


Figure 4. Extract of Two Signals From the EBS Consultation Card

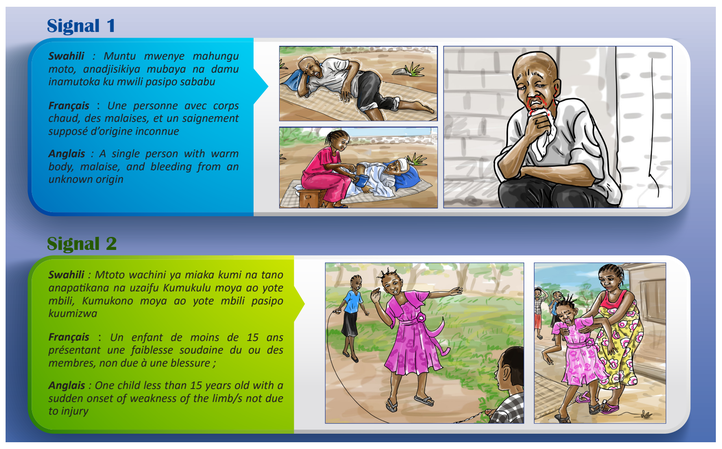


Photo 1. Group Work During Training of Key Informants in Kisanga HZ, Haut Katanga Province

Results

- Trained or briefed 7,006 health and community workers (**Photo 1/Figure 5**) to notify, triage, and report signals.
- HZ personnel conducted risk assessment of signals to determine whether investigation and response was needed.
- From March to August 2023, 853 signals were reported, 68% within 24 hours (**Figure 6**). **Signals reported within 24 hours increased from 23% to 87% after the first round of supervision.**
- A 29% rate of risk assessment demonstrated weaknesses in that process at the HZ level. This was due to the high workload of the HZ team and the need to involve specific experts who are hard to locate (i.e., veterinarian) (**Figure 6**).
- Tshamilemba and Kipushi HZs had the highest number of signals notified (**Figure 7**). Kipushi had a high number of signals notified but many fewer verified because in Kipushi the triage process took place at the health area level instead of by the CAC/CODEV, resulting in many signals determined to be non-events at the health area level.
- The majority of signals reported fell under Signal 7, "Other," suggesting a need to further tailor signals to local context (**Figure 8**). The most frequent "Other" reasons included accident (vehicle, drowning, poisoning), rash, or other illness (cough, vomiting, cancer).

Figure 5. Type and Number of Personnel Trained on the EBS System in Haut Katanga Province

Level of Training	Participants		
	F	M	Total
Provincial & Health Zone Trainers	10	14	24
Titular Nurse/Assistant Titular Nurse	60	80	140
CODEV (Development Committee) Focal Points	106	292	398
CAC (Community Animation Cell) Presidents	272	255	527
RECO & Additional Informants	2,961	2,956	5,917
Total	**3,409**	**3,597**	**7,006**

Figure 6. Number of Signals Reported and Risk Assessed in the EBS System in Haut Katanga Province, March–August 2023

Health Zone	Health Areas Reporting Signals (n/%)	Signals Reported Within 24 Hours (n/%)	Risk Assessment Within 72 Hours (n/%)
Kapolowe	9/15 (60%)	46/77 (60%)	0/4 (0%)
Kipushi	13/16 (81%)	217/336 (65%)	53/171 (31%)
Kisanga	11/15 (73%)	113/146 (77%)	1/2 (50%)
Panda	7/9 (78%)	38/60 (63%)	2/19 (11%)
Tshamilemba	8/15 (53%)	166/234 (71%)	3/8 (38%)
Total	**48/70 (69%)**	**580/853 (68%)**	**59/204 (29%)**

Figure 7. Number of Signals Notified, Triaged, and Reported as Verified Alerts and Events by Health Zone, March–August 2023

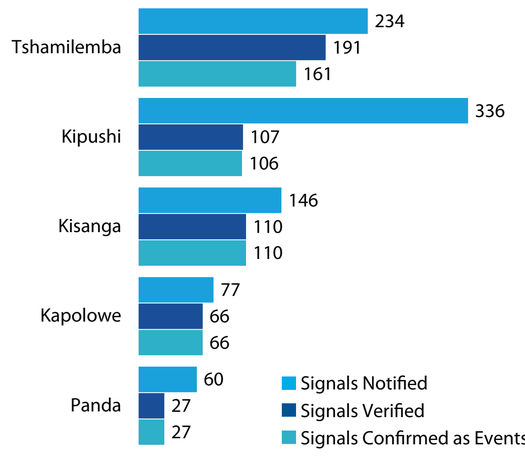
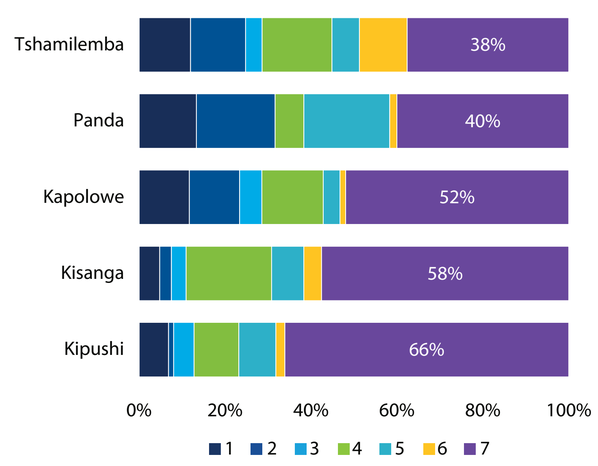


Figure 8. Proportion of Signal Type by Health Zone, March–August 2023



Conclusions

EBS is essential for early warning and detection of potential events of public health concern in a country known for sporadic outbreaks of deadly and highly transmissible diseases such as Ebola, yellow fever, mpox, etc. In addition, the EBS system reported illness because of environmental contamination, which often goes undocumented in Haut Katanga, the location of numerous mining companies. The following strengths, challenges, and recommendations were noted:

Strengths

- Enthusiasm and strong collaboration and commitment from government and health system stakeholders.
- Strengthened capacity for community surveillance in pilot health zones where it was previously nonexistent.
- Operationalization of an all-hazards and One Health approach to surveillance.
- Development of culturally appropriate awareness-raising and data collection tools.

Challenges

- Time- and resource-intensive process to develop and validate the system and train community and health personnel.
- Delays in internet/phone credits for the phone SMS alert system.
- Variable procedures across HZs and maintaining motivation of community actors in reporting, required more frequent supervision.

Recommendations

- Develop culturally appropriate motivation/remuneration to incentivize participation of community members in the system.
- Integrate resources and streamline procedures for indicator- and event-based surveillance at the health facility level to create efficiencies in supervision and monitoring.
- Prioritize support and resources for CACs to sustain a structure that continuously engages the community in being active in identifying and notifying health events in their communities.
- Periodic review and update of signals to improve sensitivity and specificity.

Acknowledgments

This study was supported by Cooperative Agreement Number NU2HGH000047 from the U.S. Centers for Disease Control and Prevention. The content is solely the responsibility of the authors and does not necessarily represent the official views of the Centers for Disease Control and Prevention, the Department of Health and Human Services, or the U.S. government.

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