



Implementing Event-Based Surveillance in Burkina Faso Using the “One Health” Approach

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Allison M. Connolly, MA, MPH

Issaka Sawadogo, MSN, MPH

Eric Geers, MA, MPH

M. Yolande B. Eugene, BS

MEASURE Evaluation
University of North Carolina at Chapel Hill
123 West Franklin Street, Suite 330
Chapel Hill, NC 27516 USA
Phone: +1 919-445-9350
measure@unc.edu
www.measureevaluation.org

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ABBREVIATIONS

ASBC	community health worker (<i>agent de santé à base communautaire</i>)
CA	community actor (ABSC, VVV and ecoguard)
CDC	United States Centers for Disease Control and Prevention
CSPS	health and welfare center (<i>centre de santé et de promotion sociale</i>)
EBS	event-based surveillance
GHSA	Global Health Security Agenda
HIS	health information system
MEEVCC	Ministry of the Environment, Green Economy and Climate Change
MRAH	Ministry of Animal Resources and Fisheries
MS	Ministry of Health
OIE	World Organization for Animal Health
RESUREP	Epidemiological Surveillance Network of Animal Diseases (<i>Réseau de Surveillance</i>)
USAID	United States Agency for International Development
VVV	village volunteer (<i>vulgarisateur volontaire village</i>)
WHO	World Health Organization

BACKGROUND

Recent outbreaks of Middle East respiratory syndrome, avian influenza, and Ebola virus disease have put local, national, regional, and global focus on the ability of countries to effectively detect and respond to emergent public health issues. Many of the outbreaks have involved zoonotic diseases: those that spread between animals and humans.

These outbreaks led countries to develop new intervention strategies through the Global Health Security Agenda (GHSA) launched in 2014. The GHSA aims to strengthen both the global capacity and nations' capacity to prevent, detect, and respond to threats from infectious diseases, facilitated by a multilateral and multisectoral approach. MEASURE Evaluation—a project funded by the United States Agency for International Development (USAID)—has been working in Burkina Faso since March 2018 in partnership with the Ministry of Animal and Fisheries Resources (MRAH); the Ministry of Health (MS); and the Ministry of the Environment, Green Economy and Climate Change (MEEVCC) to strengthen the country's ability to detect and respond to diseases with epidemic and epizootic potential using a “One Health” approach. One Health is a collaborative, multisectoral, transdisciplinary approach that works at the local, regional, national and global levels to monitor and control public health threats and to learn how diseases spread among people, animals, and their shared environment (One Health).

In Burkina Faso, each of the ministries responsible for human and animal health and the environment has a system of disease monitoring. At the Ministry of Health, the integrated disease surveillance and response (IDSR) system ensures the surveillance of diseases, including those with epidemic potential. At MRAH, surveillance of and response to animal diseases are coordinated by the Epidemiological Surveillance Network of Animal Diseases (RESUREP). MEEVCC does not have a surveillance system, but for the purpose of monitoring animals in parks and protected areas, ecological monitoring forms have been implemented to collect information on wild animals, including about their health.

Several evaluations of these monitoring systems in 2017 and 2018 (Geers, Sawadogo, Nzietchueng, & Eugene, 2018; MRAH, 2018; WHO, 2017) highlighted the lack of community participation in monitoring and the lack of collaboration and coordination among sectors in monitoring and responding to health events. A key recommendation that emerged from these evaluations was to promote an integrated surveillance system for detecting and responding to events that might threaten public health. As a result, the government of Burkina Faso, in collaboration with partners, has undertaken several initiatives:

- The validation of a decree in June 2019 to implement the One Health Coordination Platform to serve as a mechanism for developing and coordinating One Health activities in Burkina Faso
- Participation of key staff in the human, animal, and environmental sectors in the Field Epidemiology Training Program (FETP), through the support of the United States Centers for Disease Control and Prevention (CDC) and the African Field Epidemiology Network (AFENET)
- The identification of five priority zoonotic diseases for monitoring
- The creation of an event-based surveillance system (EBS), which was piloted in the health districts of Boussé, Houndé, and Kongoussi starting in 2017. MS, in collaboration with the CDC, the World Health Organization (WHO), and DAVYCAS International as the implementing partner, identified 10 “unusual” (i.e., unexpected) human health events to be surveilled. The occurrence of these unusual events may be associated with diseases of epidemic potential.

According to WHO, “event-based surveillance” refers to the organized collection, monitoring, evaluation, and interpretation of unstructured, point-in-time information about health events or risks that may represent an acute threat to health. The information is actively gathered from multiple sources, both official and unofficial, and is of a varied nature. EBS is intended to complement routine, indicator-based surveillance, which relies on a systematic process for collecting, analyzing, and interpreting structured data (WHO, 2014). These data are collected mostly through passive means; the inclusion of EBS should increase the sensitivity of a surveillance system.

Starting in 2017, MEASURE Evaluation joined other partners in assisting Burkina Faso to enhance its surveillance system as part of the project’s overarching objective to support the government in strengthening its health information system (HIS). MEASURE Evaluation’s specific objectives for HIS strengthening are: (1) to aid the government in strengthening its early-warning system by developing a community-level EBS system for diseases with epidemic and epizootic potential; (2) to strengthen the collection, analysis, and use of routine health data; (3) to strengthen the country’s capacity to manage the HIS; and (4) to develop an electronic platform to aid in the identification, notification, and follow-up of all diseases under surveillance by the Ministry of Animal Resources and the Ministry of Health.

MEASURE Evaluation has assisted at the national level in developing a One Health approach to EBS that is suited to the Burkina Faso context. To test this approach, the Center-South Region was chosen as the intervention zone. This region has three provinces: Zoundwéogo, Nahouri, and Bazèga. Nahouri, whose capital is Po, was chosen to pilot EBS activities using the One Health approach.



A community health worker and a village volunteer conducting educational outreach in the village of Pounkouyan, within Nahouri Province. Photo: Issaka Sawadogo

EBS PROJECT IMPLEMENTATION IN NAHOURI PROVINCE, CENTER-SOUTH REGION: A SUMMARY

Planning

MEASURE Evaluation conducted a rapid assessment of the animal and human health surveillance systems in the Center-South Region, including the availability of associated human resources at the community, provincial, regional, and national levels (Geers, et al., 2018). The results revealed an absence of surveillance in the wildlife reserves of the region and minimal collaboration among the ministries responsible for health, animal resources, and the environment. Data collection tools to support One Health at the provincial, district, and community levels were also absent. Finally, no mechanism existed to coordinate One Health surveillance from the community level through the national level.

At the conclusion of the assessment, detailed planning for the implementation of EBS in Nahouri Province began. Representatives from the provincial and central levels of the three ministries were engaged in an ongoing consultative process. In this process, for example, the definitions of some of the 10 unusual events were expanded to include animals. It was decided to use an existing data collection form from MS for reporting of unusual events, regardless of origin (whether in animals, humans, or a combination). Registries were created for CAs to record their educational activities along with the unusual events they identified. Furthermore, a registry was created so each service provider could record the educational activities and unusual events notified by community actors in their area, in addition to the follow-up (verification) activities undertaken by the service provider.

Overview of EBS Structure

At the community level, the EBS system in Nahouri Province relies on existing cadres, which include community health agents (ASBCs) from MS, village volunteers (VVs) from MRAH, and “ecoguards” (animal trackers) from MEEVAC. The cadres are responsible for identifying unusual health events in animals and humans that may indicate a disease with epidemic or epizootic potential. The CA notifies a local service provider—a nurse, veterinarian, or forestry officer who works for one of the three ministries. The service provider makes a field visit to verify that the event is indeed unusual and to fill out a notification form. If warranted by the findings of the service provider, provincial and perhaps regional staff from the three ministries conduct a joint investigation, which may include the collection of laboratory samples. During the verification and investigation stages, the community is kept informed of the findings and advised of any preventative measures that should be taken, per Burkina Faso’s guidelines for the management of diseases with epidemic potential.

Additional activities critical to the success of EBS are outreach sessions conducted by the CA, in which community members learn about the unusual health events. The purpose is to exponentially increase the number of people who can identify an unusual health event. Service providers assist the CA through supportive supervision. Similarly, provincial and higher-level staff should provide supportive supervision to both service providers and community actors.

Training and Supportive Supervision

MEASURE Evaluation and the three ministries involved decided that a cascaded training approach was most practical: National and regional staff members from the ministries would train provincial and district staff, who would train the service providers in Nahouri Province. Service providers would train

community actors throughout the province. MEASURE Evaluation then revised the training curriculum that had been developed for the EBS initiative supported by DAVYCAS International. Because the curriculum had been created for human health surveillance, it was broadened to encompass a One Health approach. MEASURE Evaluation reviewed the curriculum with staff from MS, MRAH, and MEEVCC and revised it pursuant to their feedback.

Training was conducted in December 2018 (MEASURE Evaluation, 2019b). Briefly, it covered identifying and notifying the 10 unusual health events, conducting effective educational sessions in the community, and completing forms and registers. Service providers also learned about One Health and received an overview of the One Health surveillance system in Burkina Faso. The project trained 27 regional and provincial staff members and 64 service providers (nurses, veterinarians, and forestry officers). The service providers instructed the 400 VVVs, ASBCs, and ecoguards, while the central, regional, and provincial staff served in a supervisory and logistical capacity at these sessions.

Table 1. Number of community actors trained in EBS, by profession and ministry, December 2018

Profession	Ministry	Number of Participants
ASBC	MS	289
VVV	MRAH	90
Ecoguards	MEEVAC	21
Total		400



A presentation at the event-based surveillance training in the village of Boungou in Nahouri Province. Photo: Issaka Sawadogo

In February 2019, MEASURE Evaluation supported joint supervisory visits (MEASURE Evaluation 2019a) at 15 sites in the province. Representatives from the provincial and regional levels in MS, MRAH, and MEEVAC were joined by MEASURE Evaluation staff members to follow up on the implementation of the EBS activity at the community level. The purpose of each visit was to assess the ability of community actors to identify unusual events and teach community members to do so, and to verify the CA's role in the surveillance system. Furthermore, the implementation of the program by service providers was reviewed, and their preliminary opinions on implementation barriers and suggestions for improvement were gathered.

RESULTS

The initial results of the implementation of EBS using the One Health approach have been encouraging. The results of an evaluation of CA training are described in detail in a March 2019 internal report (MEASURE Evaluation, 2019b). Briefly, they reveal that supervising observers, instructors, and the community actors themselves thought the CA had achieved acceptable competency in the material. Furthermore, instructors felt that they had been well prepared to teach the sessions. However, a majority of respondents thought the training should be longer than one day to allow for a slower pace of instruction and more reinforcement of the material.

In June 2019, a national meeting was held in Ouagadougou to discuss EBS progress. Provincial staff from the three ministries presented the results for the period of January 15–May 31, 2019, which included the following:

Table 2. Summary of EBS activities conducted by community agents and service providers in Nahouri Province, January 15 – May 31, 2019

Indicators	Number
Number of people reached through community outreach activities*	54,201
Number of unusual events notified to service providers by community agents	10
Number of unusual events notified by community agents that were verified by a service provider**	6
Number of unusual events notified by community agents, verified by service providers, and confirmed as unusual events	6

*The participants are not necessarily unique individuals, because the geographic areas covered by ASBCs, VVVs, and ecoguards overlap.

**Verification refers to the service provider's field visit to follow up on the report.

As shown in Table 2, 10 unusual events were notified by CAs, six of which were followed up by service providers. All six met the criteria for an unusual event. Furthermore, more than 50,000 people were reached by sensitization activities conducted by the CA, including community education (outreach) sessions and home visits. The majority of residents were reached through activities conducted by the ASBCs. This is not surprising given that nearly three-fourths of the trained CA are ASBCs. Nevertheless, the VVVs and ecoguards may have conducted additional activities that they were unable to report. (See below.)

Each ministry also reported constraints to operationalizing EBS. The most salient of these are summarized here:

- Limited resources, including fuel, affected the ability of cadres of CAs to conduct community education sessions.
- All three ministries reported that no funds were available for service providers to follow up on unusual events reported. (Each local health and welfare center [CSPS] is provided with a motorbike, although veterinary posts and forestry posts don't typically have one available.)
- Illiteracy among VVVs is common. This affected their ability to use the visual aids needed to conduct outreach sessions and to submit monthly reports of their work.

- The VVVs in particular lacked motivation to engage in EBS owing to the absence of financial compensation.
- Ecoguards, who are few in number compared with VVVs and ASBCs and typically work in more-remote locations, had difficulty reaching some areas owing to distance and accessibility. They faced communication barriers as well, including for reporting activities and unusual events, because of network infrastructure and lack of credit.

In spite of these limitations, the One Health approach has helped to formalize collaboration at the operational level among the various stakeholders in Nahouri Province. Nurses, veterinarians, and forestry officers from the three ministries have assisted community actors with outreach activities designed to educate the population to identify and report unusual events. CAs from the three ministries have worked together on outreach as well as on identifying unusual events. At the provincial and health district levels, collaboration among sectors is evident: Multisectoral and multidisciplinary teams have gone to the field several times to investigate after a service provider has reported an unusual event that is suspected of being zoonotic in origin.

Nevertheless, a potential concern is that only 10 unusual events were identified by CAs and reported to service providers within the intervention area from January 15–May 31, 2019. The broad definitions of some of the unusual events and the size of the population in Nahouri Province (estimated at 228,031¹) (Ministry of the Economy and Finances, 2009) make it reasonable to expect that more would have been identified. However, performance metrics for the identification of unusual events have not been established yet. Moreover, devising them is challenging. For example, definitions for several of the unusual events include nonspecific illness symptoms and/or require occurrence in two or more people to meet the criteria, complicating the use of routine surveillance data as a baseline for predicting the number of expected events in an EBS system. Analysis of the appropriate service-delivery registries at health and veterinary posts and inquiries with local service providers would help establish expectations for the occurrence of unusual events; ongoing adjustments to performance metrics based on experience with EBS over time should be anticipated.

As noted above, only six of the 10 unusual events notified were verified by service providers. Each of the four unusual events notified by an ASBC was verified by a nurse, whereas only two of the six reported by VVVs and ecoguards were verified. None of the ministries reported having funds available for fuel so that service providers could follow up on notifications from CAs, but having a motorbike at health posts may have facilitated follow-up by their staff. Furthermore, resource issues for veterinary and forestry officers—such as a shortage of time, fuel, or staff members—may be exacerbated by their wider and less-accessible coverage areas. It is recommended that the reasons for variation in the verification of unusual events notified by CAs be explored with the service providers directly.

¹ This is the estimated population in 2019 according to a 2009 projection, which was based on census data from 2006.

LESSONS LEARNED

The piloting of event-based surveillance using a One Health approach in Nahouri Province has provided an excellent learning experience that is essential for future scaling up. Following is a summary of the salient lessons learned:

1. Well before the One Health EBS project supported by MEASURE Evaluation began in Nahouri Province, community actors across the three ministries often worked together to address health threats or other issues. Thus, the One Health concept of multisectoral collaboration was not new to the CAs.
2. The community actors and service providers in each sector vary greatly in terms of numbers and degree of experience with similar work. For example, Nahouri Province has more than 10 times as many ASBCs as ecoguards, each of whom covers large areas that may be difficult to access. Furthermore, the nurses and ASBCs were already accustomed to doing complementary work in health monitoring and community education when this EBS project started. As a whole, ecoguards and ASBCs have higher levels of literacy than VVVs, who were traditionally involved in vaccination campaigns for chickens.

To the extent possible, these variations should be considered in both program design and training design. Expectations of CAs for community sensitization, identifying unusual events, and monthly reporting may need to vary by cadre. Establishing mentorship among CAs or working in teams are measures that might be effective in response to the variations in human-resource capacity by sector. Similarly, drastic differences in the number of service providers by sector and the type and size of terrain they cover, may signal a need to review expectations in response times and frequency of supervision.

3. A policy framework that institutionalizes multisectoral collaborations and defines roles and responsibilities will make collaboration and decision making more efficient and streamline the start-up of event-based surveillance. A policy framework is essential for scaling up EBS.
4. Involvement of MRAH, MS, and MEEVAC at all stages of the implementation process was critical to the success of this EBS pilot in Nahouri Province. At the start of the project, the existing EBS structure for human health, initially developed by the Ministry of Health, was reviewed and adapted to the needs and expectations of the animal and environment sectors, with support from MEASURE Evaluation. Additionally, technicians in the three ministries were involved early in the planning phase and were empowered to validate the tools and the training materials. Moreover, they participated at all levels of the cascaded training and in the supportive supervision visits. This approach cemented the national government's ownership of EBS using a One Health approach.

RECOMMENDATIONS

1. The decree for the One Health Coordination Platform was validated on June 25, 2019, by the technical staff at the three affected ministries and by the financial and implementing partners who support them. The decree must now be submitted to the Council of Ministers for signature and adoption. Operationalizing the platform is essential to maximize the strengths of One Health EBS and to address the challenges that have been encountered. Regular meetings of subcommittees at the provincial, regional, and central levels will provide a mechanism for addressing technical, operational, and policy issues, such as finalizing the roles and responsibilities of all actors within EBS. The One Health Coordination Platform will be vital if the government of Burkina Faso decides to implement any of the following recommendations by MEASURE Evaluation.
2. Consultation with community actors and service providers from MEEVAC, MRAH, and MS is suggested to better understand the barriers to conducting EBS activities such as community sensitization, supervision, and notification and verification of unusual events. (Interviews, surveys, and focus groups can be effective for gaining insight from a robust number of participants in diverse settings.) It is also critical to engage these cadres if any changes are envisioned for their EBS activities to take into consideration issues such as inaccessible terrain, low literacy, and resource shortages. Because community actors already collaborate across sectors for work outside EBS, they may have experience in addressing similar challenges in a locally appropriate manner.
3. The 10 unusual events should be assessed for the feasibility of incorporating illnesses/exposures related to the environment and increasing the identification of potential illnesses in animals. To accommodate these potential additions, consider whether some of the existing unusual events can be consolidated without substantial impact on the sensitivity of the surveillance system.
4. Now that essential structures for EBS using the One Health approach have been established, the data flow should be further specified. In particular, the processes need to be elaborated for aggregating the data reported to each ministry, and subsequently, ensuring the data are analyzed across sectors to reflect an integrated “One Health” surveillance system. The electronic platform being developed by MEASURE Evaluation to support disease surveillance at MRAH and MS will help address this recommendation as will the implementation of the One Health Coordination Platform.
5. A framework for monitoring the performance of One Health EBS is needed. This will entail creating performance indicators and targets and revising the notification form, which currently relies heavily on free text and should collect more information specific to animals and the environment. To ensure a systemic review of performance, regular meetings are needed along with a protocol for reviewing indicators and other key data. These meetings should include a qualitative assessment of the response to individual unusual events, starting with their identification in the community and following through to investigation by regional and central-level staff as relevant. Such after-action reviews are crucial for identifying strengths and weaknesses in multisectoral collaboration, communication, and quality of the technical work. Meetings of the Regional Epidemic Management Committee could be considered a forum for review of EBS performance.
6. Opportunities for cross-sector engagement (e.g., meetings, field visits) are critical to developing and sustaining relationships among One Health stakeholders. Strong relationships are imperative for effective decision making, problem solving, and so forth. We recommend that the government, donors, and implementing partners allocate resources for the purpose of cross-sector engagement.

7. Institutionalize EBS within the current activities of MEEVAC, MRAH and MS. Among other benefits, this should make existing government resources available for operations. For example, if EBS activities are integrated into the annual activity plans of the ministries, not only will funds be available, but scheduling conflicts, which can constrain the availability of human resources, will be ameliorated. Furthermore, integrating EBS into existing supervision activities will help ensure that EBS supervision takes place every quarter. At the community level, EBS should be officially incorporated into the scope of activities of community agents in order to formalize its importance vis à vis other activities.



Health workers from the CSPS in Gogo, Nahouri Province being interviewed during MEASURE Evaluation's rapid assessment. Photo: Issaka Sawadogo

CONCLUSION

Identifying and reporting unusual events at the community level are essential for enhancing the sensitivity of surveillance systems. The One Health approach maximizes resources across sectors and takes into consideration the relationship among human health, animal health, and the environment. The pilot project in Nahouri Province, Central-South Region, showed that the critical elements for EBS using a One Health approach are in place, although some enhancements to bring the system to greater maturity and sustainability should be explored prior to scaling up. Through the experience gained from this pilot project and the enabling environment that will be provided by the One Health Coordination Platform, the government of Burkina Faso is well positioned for future scale-up, which will significantly contribute to its ability to respond to health threats of human, animal, and environmental origin.

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MEASURE Evaluation

University of North Carolina at Chapel Hill

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Chapel Hill, North Carolina 27516

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