International Journal of Medical Science and Health Research

Vol.10, No.03; 2026

ISSN: 2581-3366

Scaling Up Community-based Surveillance in Mali: The Golden Age of Epidemiological Systems Strengthening

Souleymane Sekou Diarra[1,2,] Nouhoum Telly[1,3,] Seydou Fomba[4], Souleymane Togola,[2], Salif Samaké[5], Moulaye Baby[6], Assetou Y Dembele[6], Serge Agb[7], Oumar Sangho[1], Sory I Diawara[1], Hamadoun Sangho[1], Seydou Doumbia[1,8,] Carmen M. Camino[9]

[1]Faculty of Medicine and Odonto-Stomatology of Bamako (FMOS), Bamako, Mali
National Institute of Public Health (INSP), Bamako, Mali
[3]Sectoral Unit for the Fight Against HIV, Tuberculosis, and Viral Hepatitis, Bamako, Mali
[4]Former USAID/IDDS Project Manager
[5]Independent Consultant, Former Technical Advisor of TDDA/DAI-Global Health-program
[6]General Directorate of Health and Public Hygiene
[7]Independent Consultant, Former Technical Advisor of TDDA/DAI-Global Health-program, Ivory Coast
[8]University Center for Clinical Research (UCRC), FMOS, Bamako, Mali
[9]Former Advisor of TDDA/DAI-Global Health-program, Liverpool University external Lecturer

doi: 10.51505/ijmshr.2026.10301 URL: http://dx.doi.org/10.51505/ijmshr.2026.10301

Received: Apr 10, 2026 Accepted: Apr 20, 2026 Online Published: May 09, 2026

Abstract

Introduction: Community-Based Surveillance (CBS) in Mali is a cornerstone of early detection of diseases and public health events. It integrates community base surveillance (CBS) and media tracking with digital tools. The Malian system has made progress in its strategic and planning documents, and its level of implementation continues to improve. However, it is necessary to adapt the training for community health workers in each district and to maintain the support and motivation of these key personnel, while ensuring consistency in reporting and better data management.

Materials and Methods: We carried out a qualitative cross-sectional study, based on stakeholder interviews, document analysis, and on-site observations. Six respondents were interviewed at the strategic level (including NGOs) and eleven at the operational level (community health workers). Three interview guides and a group facilitation guide were used for the community health workers.

Results: The results showed that 83.3% of the elements deemed essential for planning include a CBS technical guide providing reliable information for implementation, as well as data collection tools (alerts, priority events) harmonized with CBS at each level. The strengths of the

Vol.10, No.03; 2026

ISSN: 2581-3366

implemented models rely primarily on the strong community involvement in the detection, dissemination of information, and support of the response to epidemics and other public health events. Regarding weaknesses, the results revealed a lack of proper archiving of community health workers' records (notification forms and attendance sheets), and the low education level for some of them prevented them from fully understanding the definitions of cases.

Conclusion: The results demonstrated the existence of a robust system for essential planning elements. In particular, the CBS technical guide provides information on the key steps to follow for CBS implementation. However, there is a need for adapting tools and training to the abilities and capacities of community staff to avoid disenfranchisement and a perception of a top-down initiative.

Keywords: Community-Based surveillance, Scaling up era, Quality interventions, Mali,

Introduction

Outbreaks typically begin with clusters of cases or sudden deaths within a community, which health facility surveillance systems often struggle to detect quickly [1]. The situation can worsen when the surveillance system has weaknesses [2]. Community-based surveillance is recognized as the best strategy for preventing outbreaks and avoiding their development into large-scale epidemics or pandemics [3-5]. In Mali, community-based surveillance relies on community health workers and digital tools to improve disease and event detection and reporting. Since the 2017 assessment of the capacity to implement the International Health Regulations (IHR), ensuring the quality of real-time epidemiological surveillance has been a strategic priority in Mali [6]. In 2021, Mali developed a plan to expand event monitoring. The phased implementation of this plan requires an analysis of the community-based surveillance (CBS) system (CBS) to better guide policymakers and partners, hence the objective of this study. It aims to identify the key elements of surveillance system planning, the current state of the SSC and an appropriate operational model to extend the epidemiological surveillance system in Mali.

Materials and Methods

We conducted a cross-sectional study in March to April 2021, using a mixed-methods approach combining qualitative and quantitative methods, interview of stakeholders, and document analysis. The interview included six respondents at the strategic level (including NGOs) and eleven at the operational level (including six community health workers).

Data collection took place in three steps: i) Initially, existing strategic documents related to the CBS of the General Directorate of Public Health and Hygiene (DGHSP), the WHO, and other partners were analyzed. These documents included the CBS technical guide, the Integrated Disease Surveillance and Response (IDSR) guideline, CBS training tools and resources, and CBS pilot sites supervision reports. ii) Meetings were held with stakeholders (actors in the human health and livestock sectors, and development partners) to gather their perceptions of CBS and to review documents describing its strategies, structures, procedures, and results, with

Vol.10, No.03; 2026

ISSN: 2581-3366

the aim of identifying weaknesses in the planning and implementation of community-based epidemiological surveillance. iii) Meetings were also conducted with health authorities in the Kati district (Chief medical officer, Epidemiological surveillance officer) and community health workers (CHW).

Data analysis was conducted using triangulation to confirm the collected information.

Results

CBS status in Mali: In collaboration with several technical and financial partners, the Ministry of Health has implemented CBS strategy in Mali through pilot projects in several health districts. Specifically, CBS was implemented in Niono and Ségou from January 1999 to June 2000 with support from UNICEF and the Inaternational Medical Corps (IMC); from October 2019 to March 2020, the Kati health district implemented it in 13 health areas with USAID/MEASURE-Evaluation project fund; International Federation of Red Cross and Red Crescent Societies and the Malian Red Cross in Kéniéba and Koulikoro, and the Malian Red Cross in Kayes, Sikasso, and Mopti, supported the various technical structures in experimenting the CBS concept using different tools and approaches [7;8]. The USAID Infectious Disease Detection and Surveillance (IDDS) project was implemented in the health districts of Kadiolo, Sikasso and Kolondieba (Sikasso region) and Kati and Kangaba (Koulikoro region) [7].

We conducted interviews with 10 key actors from the fourth targeted structures (Table 1).

Table 1: Distribution of stakeholders met by structure as of March 6, 2021

Structure	Respondents expected	Interviewees	% of interviews	Observation
DGSHP	3	3	100.0	Head of SE and SLIS Section, and ES Data Manager
DNSV	1	1	100.0	Head of the ES
CSRef	2	2	100.0	Health District Chief and Person in charge of ES
Health area	2	2	100.0	DTC
NGO	3	2	66.7	M&E and CBS focal point
Total	11	10	90.9	

DGSHP: General Directorate of Health and Public Hygiene
DNSV: National Directorate of Veterinary services
CSRef: Reference health center
ES: Epidemiological surveillance
CTD: Community health center director
M&E: Monitoring an evaluation

Vol.10, No.03; 2026

ISSN: 2581-3366

It emerged from the various meetings that CBS will produce more effect by intervening directly at the operational level (health district and community), with regular jointly national and regional levels monitoring of activities.

“I think the best approach would be to cover all 65 functional health districts, as CBS is essential for obtaining real-time information from the community and for acting quickly,” said the Head of the Epidemiological Surveillance Section of the Sub-Directorate for Disease Prevention and Control at the Directorate General of Health and Public Hygiene (SE/SDPLM/DGSHP).

Indeed, given the limited financial resources and the security situation, the proposals made by respondents suggest supporting two or three districts per region. Within each district, at least three less-performing health areas could be identified for the implementation of activities. Table 6 shows a list of health areas to be supported per, health district and region. However, the final selection of health areas to be supported must be made jointly with the health district management team and the Regional Health Directorate (DRS).

Table 2: Proposed districts and health areas for the extension of CBS interventions in Mali in 2021

Region	**Health district**	**Pop in >15 km**	**Health area**	**Pop in > 15km**
Kayes	Sagabari	37.2%	Kabalea	75.6%
			Galle	65%
			Sagabari	40.4%
	Kenieba	30.7%	Falea	75.5%
			Faraba	44.5%
			Diabara	41.4%
	Bafoulabé	23.5%	Badoumbé	66.8%
			Oulea	65.0%
			Kamagalandji	51.7%
Koulikoro	Nara	27.4%	Guénéibé	82.0%
			Boulal	66.5%
			Guiré	61.7%
	Banamba	11.6%	Sebeté	37.1%
			Toukoroba	23.1%
			Toubacoro	20.7%
	Kolokani	11.2%	Seriwala	33.7%
			Nonkon	36.0%
			Mercoya	33.5%
	Kalaban coro	10.1%	Falani	39.6%
			Kalabancoro	18.8%
			Baguineda	17.6%

Vol.10, No.03; 2026

ISSN: 2581-3366

Region	Health district	Pop in >15 km	Health area	Pop in > 15km
Sikasso	Sikasso	21.4%	Danderesso	55.0%
			Finkolo	35.4%
	Yanfolifa	20.6%	Filamana	49.7%
			Guala	39.3%
			M'Diassa	32.6%
	Bougouni	19.9%	Bamba	55.3%
			Domba	47.3%
			Dogo	42.6%
Ségou	Tominian	8.6%	Lafiala	37.0%
			Mankona	26.2%
			Fangasso	24.9%
	Macina	7.6%	Nono	54.4%
			Kermetogo	32.6%
			Souleye	26.0%
	Ségou	6.5%	N'Tombougou Digoni	39.4%
			Boussin	31.0%
			Farako	22.0%

Availability of critical elements for CBS planning**:** The table (2) below shows that Mali has 5 of the 6 critical elements for planning and implementing the CBS.

Vol.10, No.03; 2026

ISSN: 2581-3366

Table 3: Availability of critical elements for CBS planning

Question	Answer	Comments
Is there a legal/official document for CBS establishment?	Yes	The technical guide for implementing CBS in Mali was developed and validated through a multi-sectoral approach based on the "One Health" concept. This guide describes the characteristics of CBS, the implementation steps, the implementation structures, the roles and responsibilities of stakeholders, the necessary materials and equipment, and the monitoring and evaluation mechanisms for CBS.
Is there a document outlining CBS's procedures (alerts, notifications, verification, response)?	Yes	The training manual for community health workers and those responsible for implementing the CBS (Self-Employed and Community Health) system describes the procedures (alerts, notification, verification, intervention) and a decision-making algorithm for responding to signs of illness or unusual events. The CBS guide also clarifies the roles and responsibilities of the various stakeholders involved in implementing the system.
Is there a list of priority diseases for districts/health areas to be included in the CBS?	Yes	There is a list and codes for priority diseases and public health events, animal zoonoses. This list was developed taking into account the "One Health" concept. It includes 10 priority diseases (Cholera, Meningitis, Measles, Acute Flaccid Pandemic Disease, Tuberculosis, Yellow Fever, Hemorrhagic Fever, Dracunculiasis, Neonatal Tetanus and Coronavirus Disease), 8 public health events (Maternal Deaths, Neonatal and Stillbirth Deaths, Animal Bites, Envenomations, Foodborne Outbreaks, Dead Animals or Fish, Unexplained Community Deaths and other events under surveillance) and 5 animal zoonoses (Brucellosis, Bovine Tuberculosis, Avian Influenza, Rift Valley Fever and Rabies).
Do we have a document with the definitions of the Disseminate/Popularized cases for CBS?	Yes	A CBS reference guide containing definitions of all priority diseases and public health events is available and serves as a workbook for community health workers (CHWs). Community-based disease definitions can also be found in the IDSR Guideline and the CBS Guideline. The CBS Guide and the CBS reference guide have been disseminated only in the health areas that have implemented CBS, specifically in 4 health districts:

Vol.10, No.03; 2026

ISSN: 2581-3366

Question	Answer	Comments
		Kadiolo, Kalondieba, Sikasso (Sikasso region) and Kati, Kangaba (Koulikoro region).
Do we have response plans for priority diseases that districts, health areas, or communities can adapt to their context?	Yes	There are specific response plans for meningitis, measles, viral hemorrhagic fevers, Covid-19, and pandemic influenza that Districts and health areas can adapt to their context.
Is there a coordination system/organization that coordinates/organizes CBS at the national, regional, district, and health area levels? What are the terms of reference for each level, outlining responsibilities and tasks?	Yes	Specifically, there is no coordination system for CBS. However, CBS integrates the classic epidemiological surveillance system, which is well-structured from the operational to the strategic level. Furthermore, the CBS guide outlines how the system will be implemented with local authorities and activity supervisors

On-site observation allowed us to identify numerous shortcomings in the role of technical directors of community health centers (TDCHCs), including inconsistent monitoring of community health worker files, insufficient investigation of reported cases, and a lack of feedback on notified sampled cases.

The meetings conducted with community health workers revealed that they promptly report cases of illness to referral health centers, even though the patients they report often do not receive free care. Stockouts of medications and supplies needed for epidemiological surveillance are frequently observed in referral health centers. The procedural aspects and tools requiring improvement relate to data collection, configuration, and software deployment. Specifically, CBS data has not been properly configured within the (District health Information System (DHIS2) system. Furthermore, the software currently in use do not allow for the deletion of SMS messages from the trash, and data is entered manually by epidemiological surveillance officers of the health districts. Plans are in place to disseminate the tools through training sessions for stakeholders at all levels to ensure a better understanding of the CBS context. The system setting up in DHIS2 is necessary to enable data storage, real-time notification, and the performance of detailed analyses.

Based on our interviews, interventions should improve the quality of data produced through logistical support (connection networks and archiving methods) and capacity building for staff in data analysis and risk assessment, particularly through post training follow-up visits/coaching. Strengthening the community response, especially epidemiological surveys, is also essential.

Vol.10, No.03; 2026

ISSN: 2581-3366

Discussion

Analyzing strategic documents provided an overview of Mali's epidemiological surveillance system and allowed for adjustments to the data collection tools and the selection of interviewees. Qualitative approach allowed us to gather the opinions of various stakeholders on the community-based epidemiological surveillance system implemented by the Malian health system.

Piloting CBS strategies were implemented in Mali since 1999, enables community actors to identify notifiable diseases (NODs) early within the community and alert the health district to facilitate a rapid response and prevent the spread of disease in pilot localities. It allows for the rapid detection of cases within a community and the swift triggering of necessary interventions, thus contributing to life saving l. In an evaluation study of CBS in the Tillabéri region of Niger in 2021, Agballa M-E T A et al., found that the improved CBS was useful for the rapid notification of disease cases [9].

It would be advisable to designate CBS liaisons within these technical structures, with a specific job description compliant with the guidelines, to optimize the coordination of surveillance activities for priority diseases and public health events reported by community health workers.
In Mali the critical elements for CBS planning include a technical implementation guideline was developed with the involvement of all stakeholders. This guide serves as a reference document for implementing CBS activities by all public, private, and partner actors, following the "One Health" approach in Mali. In the literature, several studies have described the important role of community surveillance through the One Health approach in improving the detection, early notification, and response to public health events, despite the lack of a framework for characterizing organization and coordination being noted in most of these studies (10-15).
In this study, we observed that DHIS2 was not implemented at the community level and that no platform exists at this level for data collection, except for the phones used by community health workers. Community epidemiological surveillance data are collected using data entry forms developed by various partners.

Limitations: The unavailability of some targeted respondents for the meetings (the Red Cross Monitoring and Evaluation Officer and the Diago TDCHC, who participated in the implementation) prevented meetings from being held with these two individuals.

Conclusion

This analysis of epidemiological surveillance in Mali provided policymakers with the data and information necessary for the successful implementation of large-scale community-based surveillance. The challenges encountered with the implemented models were primarily related to telephone network issues, the motivation of community health workers, and insufficient systematic follow-up of reported alerts. Overall, the results demonstrated the robustness of the planning framework and offer prospects for expanding CBS in Mali. The implementation of this

surveillance represents a significant step towards professionalizing the quality management of public health threats.

Funding
This study did not receive any specific funding.

Acknowledgements
The authors would like to thank the health district's authorities, CHW, for their collaboration during data collected.

Conflicts of interest
The authors declare no conflicts of interest.

Authors' contributions
SSD, MB and AYD were responsible for data collection. SSD, MB and CM were responsible for data analysis and interpretation of the results. SSD wase responsible for manuscript preparation. All authors contributed to manuscript writing and/or review.

Bibliography

Craig AT, Japri AP, Heryanto B. Use of community-based surveillance to enhance emerging infectious disease intelligence generation in Indonesia. J Glob Health. 2025;15:04118. doi:10.7189/jogh.15.04118

Technical Contributors to the June 2018 WHO meeting. A definition for community-based surveillance and a way forward: results of the WHO global technical meeting, France, 2018. Euro Surveill. 2019;24(2):1800681. doi:10.2807/1560-7917.ES.2019.24.2.1800681

Halton K, Sarna M, Barnett A, et al. A systematic review of community-based interventions for emerging zoonotic infectious diseases in Southeast Asia. JBI Database Syst Rev Implement Rep. 2013;11:1–235. doi:10.11124/01938924-201311020-00001

Kyei-Faried S, Appiah-Denkyira E, Brenya D, et al. The role of community-based surveillance in health outcomes measurement. Ghana Med J. 2006;40:26.

Guerra J, Acharya P, Barnadas C. Community-based surveillance: a scoping review. PLOS ONE. 2019;14(4):e0215278. doi:10.1371/journal.pone.0215278

Organisation mondiale de la Santé. Évaluation externe conjointe des principales capacités RSI de la République du Mali, 27-30 juin 2017. Genève : OMS ; 2017.

Ministère de la Santé du Mali. Guide technique de mise en œuvre de la surveillance à base communautaire au Mali. Bamako ; 2020. p. 5-20.

Munos MK, Koffi AK, Sangho H, et al. Strengthening Community Networks for Vital Event Reporting: Community-Based Reporting of Vital Events in Rural Mali. PLoS One. 2015;10(11):e0132164. doi:10.1371/journal.pone.0132164

Tchalla Abalo AME, et al. Evaluation of community-based surveillance for acute flaccid paralysis cases in a security-compromised setting, Niger, 2021. J Interv Epidemiol Public Health. 2025;8(4):83. doi:10.37432/jieph-d-25-00138

Bordier M, Uea-Anuwong T, Binot A, et al. Characteristics of One Health surveillance systems: A systematic literature review. Prev Vet Med. 2020;181:104560. doi:10.1016/j.prevetmed.2018.10.005

Rapport d'étude. Rapport de l'étude de faisabilité pour la mise en œuvre d'un système de surveillance communautaire des risques sanitaires au Burkina Faso. 2020. 35 p.

Silva GAPD, Vieira-da-Silva LM. Health surveillance: proposal for a tool to evaluate technological arrangements in local health systems. Cad Saude Publica. 2008;24:2463-2475.

Byrne A, Nichol B. A community-centred approach to global health security: implementation experience of community-based surveillance (CBS). Glob Secur Health Sci Policy. 2020;5(1):71-84.

Uchtmann N, Herrmann JA, Hahn EC, et al. Barriers to, Efforts in, and Optimization of Integrated One Health Surveillance. EcoHealth. 2015;12:368–384. doi:10.1007/s10393-015-1022-7

Falzon LC, Alumasa L, Amanya F, et al. One Health in action: Operational aspects of an integrated surveillance system for zoonoses in western Kenya. Front Vet Sci. 2019;6:252. doi:10.3389/fvets.2019.00252