

Community leader–based event surveillance using a mobile reporting tool in Brazil and Cabo Verde: a pilot study

Monitoramento de eventos baseado em líderes comunitários utilizando uma ferramenta de notificação móvel no Brasil e em Cabo Verde: um estudo piloto

Sarah Mendes D'Angelo¹ , Patricia Paiva Pereira¹ , Luiggi Fontenele¹ , Josianne Campos¹ , Darcio Vasconcelos¹ , Yamila Carvalho² , Diogo Dinis Afonso² , Veruska Maia da Costa¹ , Fabiano Marques Rosa³ , Shelley Lees⁴ , William Nicholas , Hilary Bower , Maria da Luz Lima Mendonça , Gwenda Hughes⁴ , Jonas Lotufo Brant de Carvalho^{1,5} 

1. Brazilian Association of Field Epidemiology Professionals (ProEpi), Brasília, DF, Brazil. 2. National Institute of Public Health of Cabo Verde (INSP), Santiago, Cabo Verde. 3. Center for Strategic Information and Response in Health Surveillance of Goiás, State Department of Health of Goiás, Brazil. 4. UK Public Health Rapid Support Team / London School of Hygiene & Tropical Medicine, London, UK. 5. Health Situation Room, University of Brasília (UnB), Brasília, DF, Brazil.

Abstract

Objective: to describe the training experience of community leaders recruited to participate in Event-Based Surveillance (EBS) in Brazil and Cabo Verde, to characterize their profile, and to describe the use of a mobile application for recording EBS signs. **Methods:** this descriptive study details the training of community leaders to use a mobile data collection tool for EBS. Leaders were recruited through participatory mapping and snowball sampling in both countries. Training workshops included theoretical and practical sessions, focusing on health surveillance concepts, leadership roles, and the use of a digital application to report potential hazards to health known as “signals”. Data were collected via questionnaires and monitored through a digital dashboard. **Results:** training activities began in July 2024, and 89 leaders were trained, 39 in Brazil and 50 in Cabo Verde. Most participants had lived in their communities for over five years and had completed at least upper secondary education. Approximately 73% reported familiarity with health surveillance, and 63% with event-based surveillance. Following the training, 77% of Brazilian and 72% of Cabo Verdean leaders actively reported signals weekly. Reports began to occur in epidemiological week 34 of 2024. From epidemiological weeks 34 to 52 of 2024, 626 reports were submitted, with 71 classified as signals and 16 as potential public health risks. **Conclusion:** the pilot demonstrates that community leaders can be effectively trained to participate in Event-based surveillance, thereby contributing to the early detection of health threats. Participatory approaches and tailored training materials were fundamental to overcoming recruitment and technological challenges by involving community leaders in the evaluation of training content, using locally adapted language and examples, and providing hands-on training and continuous technical support. Continuous engagement and integration into local health systems are essential for long-term success through regular feedback mechanisms, supervision, and alignment with routine surveillance workflows.

Keywords: public health surveillance; event-based surveillance; community participation; mobile health; global health.

Resumo

Objetivo: descrever a experiência de capacitação de líderes comunitários recrutados para participar da Vigilância Baseada em Eventos (VBE) no Brasil e em Cabo Verde, caracterizar seu perfil e descrever o uso de um aplicativo móvel para registro de sinais. **Métodos:** este estudo descritivo detalha a capacitação de líderes comunitários para o uso de uma ferramenta móvel de coleta de dados para VBE. Os líderes foram recrutados por meio de mapeamento participativo e amostragem em bola de neve em ambos os países. As oficinas de capacitação incluíram sessões teóricas e práticas, com foco em conceitos de vigilância em saúde, papéis de liderança e uso de um aplicativo digital para relatar potenciais riscos à saúde, conhecidos como “sinais”. Os dados foram coletados mediante questionários e monitorados por intermédio de um painel digital. **Resultados:** as atividades de capacitação começaram em julho de 2024 e 89 líderes foram capacitados, 39 no Brasil e 50 em Cabo Verde. A maioria dos participantes residia em suas comunidades há mais de cinco anos e havia concluído, pelo menos, o ensino médio. Aproximadamente 73% relataram familiaridade com vigilância em saúde e 63% com vigilância baseada em eventos. Após o treinamento, 77% dos líderes brasileiros e 72% dos líderes cabo-verdeanos relataram ativamente sinais semanalmente. Os relatos começaram a ocorrer na semana epidemiológica 34 de 2024. Das semanas epidemiológicas 34 a 52 de 2024, 626 relatos foram registrados, com 71 classificados como sinais e 16 como potenciais riscos à saúde pública. **Conclusão:** o projeto piloto demonstra que líderes comunitários podem ser efetivamente treinados para participar da Vigilância Baseada em Eventos, contribuindo para a detecção precoce de ameaças à saúde. Abordagens participativas e materiais de treinamento personalizados foram fundamentais para superar os desafios de recrutamento e tecnológicos, envolvendo os líderes comunitários na avaliação do conteúdo do treinamento, utilizando linguagem e exemplos adaptados localmente e fornecendo treinamento prático e suporte técnico contínuo. O engajamento e a integração aos sistemas de saúde locais são essenciais para o sucesso em longo prazo, por meio de mecanismos regulares de feedback, supervisão e alinhamento com os fluxos de trabalho de vigilância de rotina.

Palavras chave: vigilância em saúde pública; vigilância baseada em eventos; participação comunitária; saúde móvel; saúde global.

INTRODUCTION

Event-based surveillance (EBS) refers to the timely process of identifying, collecting, and analyzing information on events that may pose a potential threat to public health. This data can originate from formal sources—such as structured reporting and

Correspondence: RSarah Mendes D'Angelo, Rua Dr José Frota, 255 ap 1702 Ed Triton, Fortaleza, Ceará - sarahmendes.saude@gmail.com

Received: 2025 Dez 17; Revised: 2026 Feb 9; Accepted: 2026 Feb 27

2 Community Event-Based Surveillance in Brazil and Cabo Verde

epidemiological surveillance systems—and informal sources, including media outlets, reports from healthcare professionals, non-governmental organizations, and other unconventional communication systems¹.

The inclusion of the community in this process gives rise to community-based surveillance, a simple, adaptable, and low-cost public health initiative led by communities for early detection and response. It mobilizes community members to be aware of potential health risks, which might be an unusual event that could indicate a new public health risk or the close monitoring of an existing disease outbreak. Consequently, it is adaptable for use in both routine health surveillance and emergency response².

This surveillance format involves using trained community volunteers to identify potential health risks or unusual events and report them in real time through mobile systems or other communication methods. Community-based surveillance is driven by the active involvement of health professionals and community participation¹.

Community leaders are respected members of their territory who often possess informal mechanisms to reach people, such as religious leaders addressing congregations, local eminent personalities with radio programmes or social media influencers, as well as school principals and local health workers. The community looks up to them as role models and guides in decision-making³. Respected community leaders are highly effective at reaching large populations and, therefore, are key to mobilising their communities and encouraging the adoption of positive behaviours. For community leaders, having a structured way to inform authorities of threats to their population's health may enhance their capacity to serve their community's wellbeing as well as support their position of authority in that community. Communities can vary greatly and may be defined by geographic boundaries, cultural identity, common interests, or other characteristics³.

In this context, community members can be asked to interact with trusted trained, engaged, and committed community leaders who are equipped with technological mechanisms to report 'signals', events or situations that pose a risk to public health⁴.

Considering the above, a pilot study, named the Guardians of Health – Community Leaders, was established in 2022 through a partnership that involved the Brazilian Association of Field Epidemiology Professionals (ProEpi), the Health Situation Room of the University of Brasília (SDS UnB), the National Institute of Public Health (INSP) of Cabo Verde, and the UK Public Health Rapid Support Team (UK-PHRST). The study aimed to develop an event-based surveillance system with the specific and active involvement of community leaders. Given the challenge of long-term sustainability in implementing community-based EBS, and its relative novelty in Brazil, this research sought to investigate the feasibility of this surveillance method and how to enhance

sustainability. Furthermore, it aimed to understand whether involving community leaders in the design of the data reporting system from the outset could favour its incorporation into local health surveillance.

This paper describes the experience of training community leaders recruited to participate in the EBS process in Brazil and Cabo Verde, characterizes their profile, and their use of a digital application to report EBS signals.

METHODOLOGY

Study location

The study was conducted in two developing countries, Brazil, South America, and Cabo Verde, West Africa. In Brazil, the selected territories were in the Federal District (DF), whose capital, Brasília, houses the Federal government and has a unique administrative configuration: instead of being divided into cities or neighbourhoods, it is composed of 35 Administrative Regions (RAs), officially linked to the Federal District Government. These RAs are organised into Health Regions. The following RAs were selected for the study: Itapoã, Jardim Botânico, Paranoá, and São Sebastião (5). The chosen RAs represent distinct urban and peri-urban contexts within the Federal District. Among them, São Sebastião is relatively older (established in 1993), while Jardim Botânico (2004), Itapoã (2005), and Paranoá were established more recently, reflecting different stages of urban development in Brasília.

The state of Goiás (GO) also took part in the study. Located in the Central-West region of the country, Goiás is characterised by extensive areas of Brazilian Cerrado and by important agricultural and tourism activities. For the territories belonging to this state, the municipalities were: Cavalcante, Pirenópolis, and Niquelândia. The Municipality of Cavalcante has 9,583 inhabitants. Tourism is important in the region due to its proximity to the Chapada dos Veadeiros National Park; additionally, the region is characterized by the existence of quilombos (Afro-Brazilian communities) in the rural area of the municipality⁵.

Pirenópolis is also a region characterised by tourism, stemming from its cultural tradition, the presence of waterfalls, and its proximity to urban centres such as Brasília (DF) and Goiânia (GO). The municipality has an estimated population of 27,757 residents.

Niquelândia, named after the presence of nickel ore found in its territory in the early 20th century, remains a hub of mining activity today, with a population of approximately 34,964.

In Cabo Verde, Santiago Island was chosen. It is one of the 10 islands that make up the archipelago and has 273,988 inhabitants, accounting for more than half of the national population. It consists of nine municipalities: Praia, the country's capital and the city with the highest population

3 Community Event-Based Surveillance in Brazil and Cabo Verde

density; Tarrafal, Santa Catarina, Santa Cruz, São Domingos, São Miguel, São Salvador do Mundo, São Lourenço dos Órgãos, and Ribeira Grande de Santiago (6).

Study population

Individuals residing in the territories who met the following eligibility criteria:

- Recognition by their community as a leader;
- Knowledge and understanding of the specificities of their region (socioeconomic, geographical aspects, etc.);
- Ability to communicate effectively in the language(s) designated for data collection;
- Voluntary expression of will and consent to actively participate in activities;
- Willingness to participate in training activities and report relevant signals occurring in their community;
- A well-established social network within the community.

Potential participants were identified through participatory mapping techniques, adapted to incorporate snowball sampling, or, through the exclusive use of this strategy (7). Snowball sampling is a non-probability methodology typically used for studies of unknown populations and involving 'reference chains' i.e., where identified individuals make referrals to similar people. The aim was to map community characteristics and groups and then identify formal and informal community leaders associated with them. All individuals who met the criteria, or who could develop the necessary skills after training, were invited to participate in specific project sessions focused on programmatic content, understanding of the leaders' roles in their community, and clarification of the leaders' roles in the project, after which leaders with effective community outreach were invited to participate.

Some methodological adaptations were made to achieve results more relevant to the communities and suitable to each country's context, based on comments from stakeholders and participants.

Signal capture technology

A digital participatory surveillance application called "Guardians of Health" (GoH), developed by the Brazilian Ministry of Health in 2007 in partnership with the Skoll Global Threats Fund, Epitrack and ProEpi to monitor large-scale events, was used in the study to manage the reporting of health hazard alerts (known as 'signals') by the trained leaders as it was thought digital reporting would encourage prompt identification and action. This app was used effectively in 2016 at the Olympic and Paralympic Games in Rio de Janeiro and has been continually improved and developed based on participants' feedback. In 2020, in partnership with the Health Situation Room of the University of Brasília, the tool was updated to focus on COVID-19 and is now used by several institutions. To encourage rapid identification of signals, the GoH app has been integrated

with a platform called Electronic Public Health Emergency Management (ePHEM), already used by health professionals in other countries to verify the veracity of a signal, assess risk, and monitor reported events.

Data collection and analysis

Data from community leaders

Data on thematic blocks related to the participants' sociodemographic profile, their performance characteristics as community leaders, knowledge of the topic, skills in using data analysis tools, and leadership attitudes were collected during training sessions using a structured electronic form consisting of multiple-choice questions and fields for written responses.

Reported signal data

Signals were collected in each territory by the trained community leaders using the GoH app. Each participant recorded the presence or absence of relevant events in their community weekly in the app. When the leader identified and reported a potential health threat or signal, it was classified as a 'positive report'. When there were no events in a week, the leaders were asked to 'zero report' i.e., to report in the app that no events (signals) had been identified that week, so that it was clear that they remained alert to the possible occurrence of risk situations and had not simply forgotten or failed to report. Records were organised according to the epidemiological week in which the leader became aware of the signal.

Ethical aspects

The research followed established ethical precepts and was approved by the ethics committees of the University of Brasília (UnB), Cabo Verde National Institute of Public Health (INSP), and the London School of Hygiene & Tropical Medicine (LSHTM). All participants signed the Informed Consent Form (ICF), guaranteeing their voluntary participation and the right to withdraw at any time without prejudice. The data were used exclusively for scientific purposes.

RESULTS

In the seven targeted territories in Brazil, a total of 225 leaders were initially mapped. Of these, through participatory mapping techniques and the snowball sampling method, 101 leaders were identified, and a total of 61 of them participated in the in-person participatory mapping meeting after meeting the project's established criteria. Of the 61 trained participants, only 39 agreed to participate actively in the project's activities. In the nine targeted municipalities of Cabo Verde, 51 leaders were initially mapped. Participant identification was conducted exclusively through the snowball sampling method, without in-person meetings to apply participatory mapping techniques. Through this approach, an additional 28 leaders were identified. Of the 61 recruited leaders, 58 were trained and agreed to

4 Community Event-Based Surveillance in Brazil and Cabo Verde

participate actively in the project's activities.

Between July and September 2024, seven workshops were held to train participants in the use of the data collection tool, the GoH mobile application, five (72%) in Brazil and two (28%) in Cabo Verde.

The first part of the training was delivered in person during a single session, totaling four hours of theoretical and practical activities. The objective was to discuss concepts and situations relevant to the project and equip community leaders for assertive, safe, and effective action in their communities. Topics such as health surveillance and its components, healthy and sustainable territories, types of leadership, and the use of case reporting applications were covered and considered important to the successful development of community leaders' fieldwork. Teaching materials included handouts^{8,9}, group activities, and practical activities simulating real-life public health situations, such as identifying scenarios that need to be reported by leaders.

A participatory methodology was adopted, focusing on the exchange of knowledge between participants and training facilitators. Each proposed activity began with listening to the audience's insights and a brief review of previously discussed content, followed by discussions and interactive activities. Furthermore, practical activities were conducted, in which leaders simulated health surveillance scenarios, such as identifying potential sources of infection in community settings and communicating these risks to health authorities. This component - called the Data Collection Tool Usage Workshop - focused specifically on data collection and the use of the digital systems.

In addition to the face-to-face training, the activity also included synchronous remote sessions using an online meeting application, short video presentations, and quizzes on messaging apps.

The effectiveness of the training activities was evaluated through the application of a gamified approach, with a prize award at the end of the training session. It focused on the understanding of which events are most relevant to report. The group was divided into two teams, and three stations were set up with options for making decisions about a hypothetical health risk situation: "report the signal/event," "do not report," and "don't know (unsure)." The training team presented the situations for judgment on the need to report the incident (signal/event) in the app. At the end, the participants with the most correct answers received a symbolic bonus. These activities were also monitored by the team over the three months following the training to assess the practical application of the contents learned, using a reporting dashboard.

Sociodemographic profile of the trained leaders

A total of 89 community leaders were trained, 50 from Cabo

Verde (56.2%) and 39 from Brazil (43.8%) (Table 1). A large proportion of the participants (94.1%) lived in their area of residence for more than five years, which is an important marker of settlement and familiarity with the territory.

Table 1. Sociodemographic data of community leaders invited to study training, Brazil and Cabo Verde, 2024 (N=89).

Sociodemographic data	N	%
Place of residence		
Brazil	39	43.8
Federal District	7	17.9
Goiás	32	82.1
Cabo Verde	50	56.2
Praia	25	50.0
Santa Catarina	7	14.0
Santa Cruz	6	12.0
São Lourenço dos Órgãos	4	8.0
São Miguel	3	6.0
Tarrafal	2	4.0
São Domingos	1	2.0
Cidade Velha	1	2.0
São Salvador do Mundo	1	2.0
Gender		
Female	42	47.2
Male	40	44.9
Trans-non binary	1	1.1
Not informed	6	6.7
Education		
Basic education*	2	2.2
Elementary education (complete)	2	2.2
Elementary education (incomplete)	1	1.1
High school (complete)	11	12.4
High school (incomplete)	1	1.1
Secondary education †	11	12.4
Higher education (complete)	14	15.7
Higher education (incomplete)	3	3.4
Superior ‡	30	33.7
Vocational technician	7	7.9
Not informed	7	7.9
Age range		
Up to 20 years	2	2.2
20 to 29 years old	13	14.6
30 to 39 years old	30	33.7
40 to 49 years old	20	22.5

5 Community Event-Based Surveillance in Brazil and Cabo Verde

Sociodemographic data	N	%
50 to 59 years old	12	13.5
60 years or older	6	6.7
Not informed	6	6.7

Source: GoH-CL Profile form for trained leaders.

*, †, ‡ - Education levels applied in Cabo Verde

The age of the trained leaders ranged from 18 to 71 years, with a median of 41.5 years. The predominant age group was 30 to 39 years (32.6%), followed by 40 to 49 years (29.5%). There were more females (49.4%). In terms of education, 16.5% of participants from Brazil had completed higher education, compared to 36.5% in Cabo Verde. It is noteworthy that more than 80% of the trained leaders in both countries had a level of education equal to or higher than high school (Table 1).

Additionally, 94% of the participants resided in the community, 79.5% worked in the same community where they live, and self-declared that they were attending the training as representatives of their community. It is noteworthy that 6% of the participants confirmed not to recognise themselves as community leaders, 60% affirmed to have served as leaders for more than five years, and 66.3% are legally recognised as leaders in their community (Table 2).

Table 2. Community leaders trained to use the data collection tool, according to their role as leader, Brazil and Cabo Verde, 2024 (N=83).

The leader's role/actions within the community	N	%
How long have you lived there?		
More than 5 years	78	94.0
Less than 5 years	5	6.0
Works in the place where s/he lives		
Yes	66	79,5
No	17	20.5
Are you here representing the locality where you work as a community leader?		
Yes	72	86.7
No	11	13.3
How long have you been recognized as a community leader?		
Over 5 years ago	50	60.2
Less than 1 year	14	16.9
Between 2 and 5 years	14	16.9
I still don't recognize myself as a leader	5	6.0
Is s/he a recognized leader (legally or otherwise) of some entity (church, association, institution, politics, etc.)		
Yes	55	66.3
No	28	33.7

Source: GoH-CL Trained Leadership Profile Form.

Table 3 presents the community leaders' level of experience

and familiarity with health surveillance. Among the 83 participants, 54.2% reported performing functions related to health surveillance or epidemiology in their professional activities or as leaders. Regarding technological proficiency, the majority (67.5%) reported having intermediate knowledge, 25.3% considered themselves beginners, and 7.2% indicated advanced level.

Regarding experience in the field of study, 72.2% reported being familiar with health surveillance/epidemiology; 63.4% reported being familiar with the EBS concept, and 45.1% said they had practical experience of EBS. When asked specifically about community-based event-based surveillance, 39% reported being familiar with a strategy that involves the direct participation of community leaders.

Table 3. Familiarity and experience with health surveillance/epidemiology of trained community leaders, Brazil and Cabo Verde, 2024 (N=83)

Familiarity and experience with health surveillance	N	%
Do you perform functions related to health surveillance/epidemiology in the exercise of your professional duties or as a community leader?		
Yes	45	54.2
No	38	45.8
What is your level of technological mastery?		
Intermediate (E.g.: Everything a beginner can do + office mastery; browse websites; can do research; master zoom)	56	67.5
Beginner (Eg: I can send emails; browse social media)	21	25.3
Advanced (Everything an intermediate can do + ability to develop apps, websites, programming language proficiency)	6	7.2
Are you familiar with health surveillance/epidemiology?		
Yes	57	68.7
No	22	26.5
Not answered	4	4,8
Are you familiar with event-based surveillance (EBS)?		
Yes	52	62.5
No	30	36.1
Not answered	1	1.2
Have you had any experience with EBS?		
Yes	37	44.6
No	45	54.2
Not answered	1	1.2

Familiarity and experience with health surveillance	N	%
Is Community-based EBS (with the participation of community leaders) familiar to you?		
Yes	32	38.5
No	50	60.2
Not answered	1	1.2

Source: GoH-CLTrained Leadership Profile Form.

Description of signs reported by community leaders

After completing training in each territory, leaders were able to report health signals occurring in their communities. These are now referred to as Community Leaders for Health Surveillance (CLHS). Active leaders were those who reported at least once a week on the app, even when there were no relevant health situations in the community, i.e., a 'zero report'. In Brazil, 77% (30/39) of the leaders trained agreed to participate in the project, and in Cabo Verde, 71% (41/50) (Table 4).

Table 4. CLHS ' compliance in weekly reporting, by territory, for epidemiological weeks 34 to 52, 2024, Brazil and Cabo Verde.

Country/Territories	Capable Leaders	Active Leaders	%
Brazil	39	30	76.9
Pirenópolis-GO	13	12	92.3
Cavalcante-GO	7	6	85.7
Niquelândia-GO	12	9	75.0
São Sebastião-DF	7	3	42.9
Cabo Verde	50	41	70.7
Santa Cruz	6	5	100.0
São Salvador do Mundo	1	3	100.0
São Miguel	3	2	100.0
Praia	25	22	81.5
São Lourenço dos Órgãos	4	2	66.7
Ribeira Grande De Santiago	1	1	50.0
Santa Catarina	7	4	44.4
São Domingos	1	1	33.3
Tarrafal	2	1	25.0

Source: Health Guardians App.

Leaders from the municipality of Cavalcante in Brazil and Tarrafal in Cabo Verde stand out for their greater participation in reporting signals in the application, accounting for an average of 68% and 50% of signals weekly, respectively (Table 5).

The CLHS recorded a total of 626 weekly reports, 277 (44%) in Brazil and 349 (66%) in Cabo Verde. In Brazil, 7% of the weekly reports (20/277) contained signals; the rest were zero reports, with the municipality of Cavalcante presenting the highest number (9). In Cabo Verde, 15% (51/349) of weekly reports

contained signals, with the city of Praia presenting the highest number.

Table 5. Average number of reports per week by territory for epidemiological weeks 35-52, 2024.

COUNTRY/TERRITORIES	AVERAGE EW*	SD**
	REPORT	
Brazil		
Cavalcante-GO (EW*,n=16)	10	5.6
São Sebastião-DF (EW*,n=18)	8	7
Pirenópolis-GO (EW*,n=18)	5	2.6
Niquelândia-GO (EW*,n=17)	4	4.1
Cabo Verde (EW*, n=34)		
São Salvador do Mundo	8	4
Tarrafal	8	-
Santa Catarina	6	7
Praia	4	4
Ribeira Grande de Santiago	4	1.4
São Domingos	-	-
Santa Cruz	5	6
São Lourenço Dos Órgãos	5	-
São Miguel	3	3

*Epidemiological Week**Standard deviation

Source: Health of Guardians App

Out of the 71 signals, 16 were verified and classified as events, meaning they required investigation/monitoring by local health authorities to assess their public health importance, 13 of them in Brazil, representing 18.3% of its recorded signals and 4.2% in Cabo Verde (Table 6).

Table 6. Frequency of signals and events of potential public health importance, by territory, for epidemiological weeks 34 to 52, 2024, Brazil and Cabo Verde.

Country/Territories	Positive signs	%	Events	%
Brazil				
São Sebastião-DF	5	25	4	80.0
Cavalcante-GO	9	45	6	66.7
Pirenópolis-GO	3	15	2	66.7
Niquelândia-GO	3	15	1	33.3
Cabo Verde				
Ribeira Grande de Santiago	3	6	1	33.3
Santa Catarina	14	28	1	7.1
Praia	16	32	1	6.3
São Lourenço dos Órgãos	8	16	0	0.0
São Miguel	5	10	0	0.0
São Salvador Do Mundo	4	8	0	0.0

Country/Territories	Positive signs	%	Events	%
Tarrafal	1	2	0	0.0
Santa Cruz	0	0	0	0.0
TOTAL	71	100	16	22.5

Source: ePHEM

Challenges and Lessons Learned

During the implementation of the pilot project, some challenges were identified, such as the difficulty in mapping and recruiting community leaders—some of whom did not perceive themselves as such. Some participants struggled to balance activity schedules with personal responsibilities, meaning there was a substantial drop-out between mapping and participation. There were also limited technological resources available for certain teaching activities. However, the use of participatory methodologies and teaching materials adapted to the local context helped mitigate these issues.

The experience highlighted the importance of continuous monitoring by trained leaders, through bi-weekly contact, to ensure that health surveillance actions, through event-based community surveillance, are effectively incorporated into the daily life of the community.

DISCUSSION

The experience described in this study indicates that the structured participation of community leaders in event-based surveillance is feasible and operational in Brazilian and Cabo Verdean territories, with significant levels of adherence to the weekly use of the digital tool. This finding converges with the conception of event-based surveillance as an agile process of identifying, verifying, and analyzing signals from formal and informal sources, as highlighted by the World Health Organization (WHO)¹.

Furthermore, the results suggest that organized community mobilization can increase the sensitivity of the system, corroborating previous experiences of participatory surveillance of infectious diseases, as reported by Mariner et al. (2014), who emphasize the capacity of local actors to detect relevant events early (2). The contribution of leaders as a territorial link between services and the population underscores the relevance of effective risk communication and the need for continuous engagement mechanisms – elements emphasized in the World Health Organization's Risk Communication and Community Engagement (RCCE) guidelines in emergency situations⁴.

Our findings are consistent with recent evidence demonstrating that community surveillance can strengthen the early detection of emerging health threats and enhance local preparedness and response capacity (10). Jung et al. concur with our findings when they state that community surveillance with volunteers

strengthens early warning systems, especially where formal surveillance is limited¹¹.

The high proportion of participants familiar with surveillance and digital technologies may have favored the incorporation of the Guardians of Health application, but we also found that simple digital tools can enhance public health initiatives in contexts with logistical constraints. The integration of the tool with systems already used by services, such as ePHEM, brings the pilot project closer to the recommendations for the integrated strengthening of epidemiological surveillance systems made by the African Centers for Disease Control³.

The mapping and recruitment process proved adequate to reach heterogeneous groups and identify distinct leadership in the territories, according to methodologies previously described by ProEpi⁷. However, the reported challenges – low perception of leadership identity among some of the invitees and difficulties in reconciling personal routines with the demands of surveillance – reinforce the need for retention strategies and continuous support.

The differences observed between territories regarding the frequency of records and the identification of signs may reflect local sociodemographic and epidemiological characteristics. Census data point to significant structural inequalities between Brazilian and Cabo Verdean municipalities^{5,6}, suggesting that the sustainability of community surveillance depends on the contextualized adaptation of training processes and supervision models.

Another relevant aspect concerns the role of initial and ongoing training. Contextualized educational materials, such as those developed by ProEpi (8,9), facilitated the understanding of community surveillance concepts and practices, contributing to levels of adherence to active communication and the use of the tool. These results reinforce the literature that highlights that strengthening local capacities is a central element for the institutionalization of event-based surveillance (EBS) and its integration into formal surveillance^{1,3}. This point aligns with the findings of Maddah et al., 2023, who state that digital participatory surveillance systems have demonstrated improvements in the timeliness and responsiveness of public health surveillance, reinforcing the role of community-based digital reporting as a complementary strategy to traditional surveillance systems¹².

In summary, these pilot results suggest that the active inclusion of community leaders as reporting agents expands the territorial reach of surveillance and favors the early detection of health risks. However, the operational challenges encountered indicate that the sustainable adoption of this model requires continuous supervision, feedback mechanisms, intersectoral coordination, and ongoing institutional support. These issues will be further interrogated when results from the full 12-month project implementation are available.

CONCLUSION

Our experience demonstrated the operational feasibility of training community leaders to support event-based surveillance through the use of a mobile digital tool for the systematic reporting of signs that may represent events of public health importance. Training 89 leaders in two geographic contexts resulted in satisfactory and continuous engagement, with 77% of Brazilian leaders and 71% of Cabo Verdean leaders maintaining weekly reporting over 18 weeks, totaling 626 reports. Of these, 71 signals were identified, including 16 events classified as potential public health risks and two that required a coordinated response from health authorities, highlighting the ability of trained community leaders to detect events relevant to timely public health actions.

Therefore, the experience of the Guardians of Health – Community Leaders pilot project suggests that participatory methodologies, combined with contextualized teaching materials and adaptable tools, can foster the engagement and adherence of those involved, and that active participation of community leaders, combined with the use of accessible technologies, can strengthen event-based community surveillance, contributing to the early detection of public health risks.

Furthermore, with adequate training and ongoing support, leaders can integrate surveillance practices into the daily lives of their communities, expanding the reach of health interventions and enabling more timely responses.

The pilot project highlighted the importance of participatory strategies that consider the sociocultural context and value local knowledge as key elements for the success and sustainability of such initiatives.

Our experience also highlighted that incorporating event-based reporting into the formal surveillance system and maintaining continuous technical monitoring are critical factors for the sustainability and effectiveness of implementing an event-based surveillance strategy. The involvement of health authorities from the outset is also essential to transform the knowledge generated into effective actions.

Future studies should test this approach in other regions, as

REFERENCES

1. World Health Organization. A guide to establishing event-based surveillance [Internet]. Geneva: WHO; 2014 [cited 2025 Dec 18]. Available from: <https://www.who.int/publications/i/item/9789290613213>.
2. Mariner JC, Jones BA, Hendrickx S, El Masry I, Jobre Y, Jost CC. Experiences in Participatory Surveillance and Community-based Reporting Systems for H5N1 Highly Pathogenic Avian Influenza: A Case Study Approach. *Ecohealth*. 2014; 11(1): 22–35. doi: 10.1007/s10393-014-0916-0.
3. Africa CDC. Event-based Surveillance Resources [Internet]. Ethiopia; 2023 Mar [cited 2025 Dec 18]. Available from: <https://africacdc.org/download/africa-cdc-event-based-surveillance-framework-2/>.
4. World Health Organization. Risk Communication and Community Engagement

well as explore mechanisms to strengthen the process, such as the use of incentives, supervision, and feedback to maintain the motivation of leaders and the quality of the data collected. In this way, it will be possible to consolidate community surveillance as an inclusive, collaborative, and context-sensitive strategic component for the early detection of public health risks.

Partnerships

This training was made possible through a partnership between the Municipal Health Departments of Niquelândia, Cavalcante, and Pirenópolis, the State Health Departments of Goiás and the Federal District, local non-governmental organisations, and professionals from universities in the regions, who provided technical, logistical, and support. This collaboration was essential for the development of quality workshops.

ACKNOWLEDGMENTS

The Brazilian Association of Field Epidemiology Professionals (ProEpi) and the National Institute of Public Health of Cabo Verde (INSP) would like to thank all partner institutions for their strong collaboration. In Brazil, the Superintendence of the Eastern Health Region of the Federal District and the Subsecretariat of Health Surveillance of the State Department of Health of Goiás. In Cabo Verde, the Multisectoral Commission of the National Coordination Body for the “One Health” Approach. Additionally, long-standing technical and financial support from the UK Public Health Rapid Support Team/London School of Hygiene & Tropical Medicine has enabled this technology to develop and contribute to epidemic prevention and response efforts. We are especially grateful to the communities and community volunteers for their continued involvement in community health activities and for their invaluable contributions to the success of this initiative. This research study is funded by the United Kingdom Public Health Rapid Support Team (UK-PHRST) NIHR CCF award: IS-RRT-1015-00. The UK Public Health Rapid Support team is funded by UK Aid from the Department of Health and Social Care and is jointly managed by the UK Health Security Agency and the London School of Hygiene & Tropical Medicine. The views expressed in this publication are those of the author(s) and not necessarily those of the Department of Health and Social Care.

(RCCE) Action Plan Guidance COVID-19 Preparedness and Response [Internet]. Geneva: WHO; 2020 Mar 16 [cited 2025 Dec 18]. Disponível em: [https://www.who.int/publications/i/item/risk-communication-and-community-engagement-\(rcce\)-action-plan-guidance](https://www.who.int/publications/i/item/risk-communication-and-community-engagement-(rcce)-action-plan-guidance).

5. Instituto Brasileiro de Geografia e Estatística. Estimativas da população residente nos municípios e unidades federativas brasileiras com data de referência de 1º de julho de 2022. [Internet]. Rio de Janeiro: IBGE; 2022 [cited 2025 Dec 10]. Available from: <https://www.ibge.gov.br/cidades-e-estados>.

6. National Institute of Statistics. The final results of the 5th General Census of Population and Housing – RGPH [Internet]. Praia (CV): INE; 2021 [cited 2025 Jun 9]. Available from: <https://www.ine.cv/estatisticas-por-tema/21>

9 Community Event-Based Surveillance in Brazil and Cabo Verde

7. Associação Brasileira de Profissionais de Epidemiologia de Campo. Mapping community leaders for local public health surveillance [Internet]. Brasília: ProEpi; 2024 [cited 2025 Dec 10]. 13 p. Available from: <https://fi-admin.bvsalud.org/document/view/6gtgm>.
8. Associação Brasileira de Profissionais de Epidemiologia de Campo. Event-based surveillance training for the Cabo Verde community [Internet]. Brasília: ProEpi; 2024 [cited 2025 Dec 10]. Available from: <https://fi-admin.bvsalud.org/document/view/cupxj>.
9. Associação Brasileira de Profissionais de Epidemiologia de Campo. Event-based surveillance training for the community: Brazil [Internet]. Brasília: ProEpi; 2024 [cited 2025 Dec 10]. Available from: <https://fi-admin.bvsalud.org/document/view/bycbr>.
10. Craig AT, Japri AP, Heryanto B. Use of community-based surveillance to enhance emerging infectious disease intelligence generation in Indonesia. *J Glob Health*. 2025 Jun 20; 15: 04118. doi: [10.7189/jogh.15.04118](https://doi.org/10.7189/jogh.15.04118).
11. Jung J, Larsen TM, Beledi AH, Takahashi E, Ahmed AO, Reid J, et al. Community-based surveillance programme evaluation using the platform Nyss implemented by the Somali Red Crescent Society—a mixed methods approach. *Confl Health*. 2024 Mar; 18(20). doi: <https://doi.org/10.1186/s13031-024-00578-5>.
12. Noha Maddah, Arpana Verma, Maryam Almashmoum, John Ainsworth, Effectiveness of Public Health Digital Surveillance Systems for Infectious Disease Prevention and Control at Mass Gatherings: Systematic Review. *J Med Internet Res*. 2023 May; 25: e44649. doi: <https://doi.org/10.2196/44649>.

Como citar este artigo/ How to cite this article:

D'Angelo SM, Pereira PP, Fontenele L, Campos J, Vasconcelos D, Carvalho Y, et al. Community Leader-Based Event Surveillance Using a Mobile Reporting Tool in Brazil and Cabo Verde: A Pilot Study. *J Health Biol Sci*. 2026; 14(1): e6228.