Guidance for implementing community event-based surveillance for early warning and response to acute public health events and emergencies



PAHO
Pan American Health Organization
World Health Organization
Americas Region

Guidance for implementing community event-based surveillance for early warning and response to acute public health events and emergencies

Washington, D.C., 2026

PAHO Pan American Health Organization World Health Organization Americas Region

Guidance for implementing community event-based surveillance for early warning and response to acute public health events and emergencies

ISBN: 978-92-75-13144-2 (PDF)
ISBN: 978-92-75-13145-9 (Print)

© Pan American Health Organization, 2026

Some rights reserved. This work is available under the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 IGO license (CC BY-NC-SA 3.0 IGO).



Under the terms of this license, this work may be copied, redistributed, and adapted for non-commercial purposes, provided the new work is issued using the same or equivalent Creative Commons license and it is appropriately cited, as indicated below. In any use of this work, there should be no suggestion that the Pan American Health Organization (PAHO) endorses any specific organization, product, or service. Use of the PAHO logo is not permitted.

Adaptations: If this work is adapted, the following disclaimer should be added along with the suggested citation: "This is an adaptation of an original work by the Pan American Health Organization (PAHO). Views and opinions expressed in the adaptation are the sole responsibility of the author(s) of the adaptation and are not endorsed by PAHO."

Translations: If this work is translated, the following disclaimer should be added along with the suggested citation: "This translation was not created by the Pan American Health Organization (PAHO). PAHO is not responsible for the content or accuracy of this translation.

Suggested citation: Pan American Health Organization. Guidance for implementing community event-based surveillance for early warning and response to acute public health events and emergencies. Washington, D.C.: PAHO; 2026. Available from: https://doi.org/10.37774/9789275131442.

Cataloguing-in-Publication (CIP) data: Available at http://iris.paho.org.

Sales, rights, and licensing: To purchase PAHO publications, email: sales@paho.org. To submit requests for commercial use and queries on rights and licensing, visit: https://www.paho.org/en/publications/permissions-and-licensing.

Third-party materials: If material that is attributed to a third party, such as tables, figures, or images, is reused from this work, it is the user's responsibility to determine whether permission is needed for that reuse and to obtain permission from the copyright holder. The risk of claims resulting from infringement of any third-party-owned material or component from this work rests solely with the user.

General disclaimers: The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of PAHO concerning the legal status of any country, territory, city, or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by PAHO in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

All reasonable precautions have been taken by PAHO to verify the information contained in this publication. However, the published material is being distributed without warranty of any kind, either expressed or implied. The responsibility for the interpretation and use of the material lies with the reader. In no event shall PAHO be liable for damages arising from its use.

PHE/HIM/2026

Cover design, editorial design and layout: Brenda Márquez Georgge

CONTENTS

Acknowledgments iv

Summary v

Introduction 1
- Purpose 2
- Objectives 2
  - Scope 2
  - Target audience 2

1. Conceptual framework 4
- Community event-based surveillance 5
- Basic components of community event-based surveillance 6
- Phases of the community event-based surveillance process 7

2. Risk characterization and gap analysis 8

3. Prioritization of public health threats and events for surveillance 10

4. Strategic planning 12
- Defining objectives 13
- Stakeholder mapping 13
- Advocacy and stakeholder mobilization 14
- Governance 15
- Adapting the institutional and legal framework 15
- Resource allocation 16

5. Operational planning 18
- Defining roles and responsibilities 19
- Coordination mechanisms 19
- Assembling teams 20
- Developing the training plan 20
- Community engagement 21
- Technical and operational support 22

6. Implementation 24
- Selecting the surveillance model 25
- Preparation of key documents 27
- Integrating and empowering community agents in community event-based surveillance 28
- Signal reporting 30
  - Signal classification 30
  - Reporting mechanisms 32
  - Ethical considerations 32
- Signal triage 33
- Signal verification 33
- Risk assessment 34
- Response 34

7. Monitoring and evaluation 36

8. Information dissemination and feedback 38

References 40

Bibliography 42

Glossary 44

Annexes 48
- Annex 1. Proposed responsibilities for implementing community event-based surveillance 49
- Annex 2. Examples of signals to be reported through community event-based surveillance 60
- Annex 3. Examples of indicators for community event-based surveillance 65

ACKNOWLEDGMENTS

The Pan American Health Organization (PAHO) extends its sincere gratitude to the experts from Member States and members of the various PAHO teams who participated in the technical review and collective development of the *Guidance for implementing community event-based surveillance (for early warning and response to acute public health events and emergencies*[1]:

Maya Espinoza (Ministry of Health and Sports of Bolivia), Alessandro Romano Pecego (Ministry of Health of Brazil), José Carlos Veloso (Ministry of Health of Brazil), Christian García (Ministry of Health of Chile), Rodrigo Berríos Vigneaux (Ministry of Health of Chile), Franklyn Prieto Alvarado (National Institute of Health of Colombia), Hernán Quijada Bonilla (National Institute of Health of Colombia), Maritza Gonzalez Duarte (National Institute of Health of Colombia), Olga Bellido Cuéllar (Department of Amazonas, Colombia), Andrea Morillo Gómez (Department of Putumayo, Colombia), Constanza Cuéllar Gordo (Department of Magdalena, Colombia), Luz Alba Colorado (Department of Guaviare, Colombia), Diego Ortíz Hernández (Department of Guainía, Colombia), Fernando Rita (Department of Antioquia, Colombia), Ximena Janeth Castillo Narváez (Ministry of Public Health of Ecuador), María Fernanda Alcívar Gómez (Ministry of Public Health of Ecuador), Iván Mauricio Alcocer Ortega (Ministry of Public Health of Ecuador), Alfredo Antonio Amores Ulloa (Shushufindi, Ecuador), José León Calores Vásquez (Ministry of Health of El Salvador), Neida Bettiana Martínez Pereira (Ministry of Public Health and Social Welfare of Paraguay), Gloria Mabel Mármol García (Ministry of Public Health and Social Welfare of Paraguay), Carlos Martínez Paredes (Ministry of Health of Peru), Dana DaCosta Gómez (Ministry of Health of Saint Lucia), Mariana Casas Pereira (Ministry of Public Health of Uruguay), Sofía Pandolfo Santurio (Ministry of Public Health of Uruguay), Andrew Boyd (U.S. Centers for Disease Control and Prevention), Emily Weston (U.S. Centers for Disease Control and Prevention), Roberto Esteves (U.S. Centers for Disease Control and Prevention).

PAHO would also like to thank the PAHO/WHO team: María Almirón (PHE/HIM), Marc Rondy (PHE/IHM), Krista Swanson (PHE/HIM), Mauricio Cerpa (PAHO Colombia), Valeska Stempliuk (PAHO Ecuador), Raúl García Acevedo (PHE/HIM), Juan Camilo Rojas Hernández (PHE/HIM), Xaviera Molina (PHE/HIM), Alison Paredes (PAHO Bolivia), Josy María De Pinho da Silva (PAHO Brazil), Camilo Ávila (PAHO Colombia), Heiddy Vargas (PAHO Colombia), Diana Malo (PAHO Colombia), Magdalena Alcocer Díaz (PAHO Ecuador), Guillermo Sequera (PAHO Paraguay).

This initiative reflects the cooperation among countries in the Americas, both within the framework of the PROTECT Project, funded by the Pandemic Fund, and in implementing the Strategy on Epidemic Intelligence for Strengthening Early Warning of Health Emergencies 2024–2029.

PAHO also thanks the WHO Hub for Pandemic and Epidemic Intelligence (Berlin) for its support in developing and publishing this guidance.

1 The positions and affiliations listed correspond to those held at the time of participation in the technical meetings and do not necessarily reflect the participants' current institutional positions.

SUMMARY

This guidance provides a framework for designing and strengthening community event-based surveillance (CEBS) as an integral component of early warning and response systems for acute public health events and emergencies in the Region of the Americas.

CEBS is defined as the detection and reporting of events of public health importance within a community by members of that community. This approach regards the community as a source of data and information regarding potential acute risks to human health. It complements traditional surveillance systems by expanding their coverage and sensitivity.

This guidance proposes a structured, formal process for linking community participation with national surveillance systems under the leadership of health authorities and in coordination with multiple sectors, including human health, animal health, and environmental sectors. The process includes interconnected phases of risk characterization and gap analysis; prioritizing public health threats and events; strategic and operational planning; implementation; information dissemination and feedback; and monitoring and evaluation.

The strengthening of community agents is a key component. Volunteers recognized by their communities identify signals of potential public health events, working alongside health personnel and other stakeholders. This document outlines how to form teams, establish coordination mechanisms, design culturally-relevant training plans, and develop key documents such as surveillance protocols, guidelines for community agents, and early warning procedures.

It also describes the flow of information, from initial signal reporting, triage, verification, and risk assessment to the activation of public health interventions and referrals to relevant services. It highlights the importance of two-way communication mechanisms, adequate information management, and continuous feedback to the community.

It addresses key ethical issues, including respect for communities' differing cultures and worldviews, confidentiality of information, and responsible use of data to protect the populations under surveillance.

Overall, this guidance supports Member States in establishing robust early warning and response systems, while promoting shared social responsibility in health and helping communities become better prepared and more resilient when faced with outbreaks, epidemics, and health emergencies.

INTRODUCTION

Public health surveillance is essential for the early detection of events that may pose a threat to public health, particularly those requiring prompt investigation and response. Traditional public health surveillance systems must be ready to detect public health threats at all times, regardless of origin or location. These surveillance systems use disease incidence, including the number of human cases, hospitalizations, or deaths (attributable mortality), laboratory diagnosis, and genomic analysis of pathogens (genomic surveillance), to detect potential changes or unusual patterns of public health importance. In this context, changes in the incidence of cases, whether regarding person, place, or time, constitute 'signals' requiring investigation or verification. Therefore, robust surveillance of cases over time is needed in order to provide a reference baseline. Furthermore, the rapid detection of emerging and re-emerging public health threats relies on efficient data collection from a variety of sources beyond traditional settings (e.g., healthcare services, surveillance programs, and laboratory diagnostics) *(1)*. For these reasons, it is important to identify mechanisms and approaches that can complement traditional public health surveillance in order to expand the coverage and strengthen the sensitivity of the systems.

The ongoing risks from outbreaks and epidemics, and the impacts from climate change, socioeconomic inequalities, and demographic changes, are just some of the challenges encountered by health systems in countries and areas of the Region. The prolonged crisis caused by the COVID-19 pandemic exacerbated existing vulnerabilities, and demonstrated the importance of strengthening early warning and response through enhanced capacities to detect, verify, investigate, and assess risk. It also highlighted the need to implement public health measures in order to save lives and reduce the negative impacts of public health events and emergencies *(2)*.

Adopting complementary approaches that are not solely reliant on healthcare services, such as those involving human health, animal health, and environmental sectors, will increase systems' abilities to detect new public health threats or events in a timely manner. These complementary approaches must be integrated into traditional public health surveillance systems in order to monitor the epidemiological patterns of public health threats over time. They can provide critically important information when there is no historical baseline, the diagnosis of cases is not exhaustive, or the initial number of cases is limited. Community event-based surveillance (CEBS) is one such complementary approach that enhances traditional surveillance systems and actively involves the community, thereby increasing surveillance systems' sensitivity and coverage.

In the Region of the Americas, recorded CEBS strategies date back to the Declaration of Alma-Ata *(3)* in the 1970s. This declaration encouraged communities to participate in primary healthcare and recognized their role in identifying public health issues, carrying out interventions, and promoting health. In the 1980s, Peru launched the Community Surveillance System (SIVICOS, per its acronym in Spanish), which directly involved communities in conducting surveillance of infectious diseases such as acute diarrhea, respiratory infections, and malaria *(4)*. Similarly, Colombia adopted CEBS in the 1990s as a key strategy to control certain diseases, such as dengue and malaria. This strategy was refined over time based on experiences and lessons learned *(5)*.

Similar experiences have been documented in other regions. The World Health Organization (WHO) Regional Office for Africa has reported community volunteer programs that support surveillance initiatives and programs to eradicate polio, onchocerciasis, and dracunculiasis, control trachoma, and facilitate the implementation of integrated maternal and child health programs *(6)*. Research in Niger has shown that the quality of surveillance can be improved through community-based approaches, and positive outcomes have been reported for smallpox eradication and dracunculiasis control programs *(7)*. Similar initiatives are ongoing in Central Asia; Kyrgyzstan, for instance, has promoted community-based health initiatives supporting populations and addressing community issues and concerns through rural health committees *(8)*.

Integrating CEBS into traditional surveillance systems to strengthen early warning and response is an effective way to better detect public health threats. The timely detection of these public health threats enables rapid implementation of public health interventions that can save lives and reduce the negative impacts of emergencies, including effects on physical and mental health, economic losses, social disruption, and environmental damage *(9)*. This, in turn, strengthens communities' capacities to address emerging problems. Empowering communities to play a greater role in public health leads to healthier and more resilient societies.

Purpose

This guidance aims to support Member States' efforts in establishing robust systems for early detection, warning, and response to acute public health events and emergencies by incorporating a community-centered approach to event-based surveillance.

However, this guidance may also be useful for establishing a CEBS approach that goes beyond the early detection and warning of acute public health events and emergencies. The guidance for strategic planning, operational planning, and implementation can serve as a reference for developing CEBS.

Objectives

The objective of this guidance is to provide Member States with recommendations for establishing or strengthening CEBS. As this guidance is general in nature, each Member State is able to tailor it to their specific needs.

Scope

This guidance provides direction for designing and strengthening CEBS, including the conceptual framework, planning, implementation, and monitoring and evaluation. It emphasizes the importance of community engagement, beginning with the planning phase and continuing through the implementation and evaluation of CEBS. Similarly, it is essential to consider the involvement of other sectors to facilitate the planning, management, and operationalization of this surveillance approach.

This document is provisional, and will be revised and adapted as more experience is gained, new evidence is obtained, and the benefits of technological advances become apparent.

Target audience

This guidance is primarily intended for health authorities responsible for public health surveillance at the national level. It may also be useful for other sectors and stakeholders interested in supporting CEBS activities, such as animal health and environmental sectors, community associations, health institutions, non-governmental organizations, and academia.



1. CONCEPTUAL FRAMEWORK

Community event-based surveillance

For the purposes of this guidance, an adapted definition for "*community event-based surveillance*" is proposed, derived from the 2018 consensus of the World Health Organization (WHO) Technical Advisory Group, which defined *community-based surveillance* as the detection and reporting of events of public health importance within a community by members of that community *(10)*. Additionally, the term "*community*" is adopted from the United Nations Educational, Scientific and Cultural Organization (UNESCO), defined as a group of people sharing common characteristics or interests. A community may be a group of people based on geographical location, or a group with shared interests or a common demographic profile, regardless of physical location within a country *(11)*.

The WHO Technical Advisory Group recommended adopting a systematic approach to defining CEBS as a structured, formal process rather than viewing it as a separate, vertical system. Similarly, the term "events of public health importance" was used to include not only signals of unusual events, but also any condition, disease, or event with public health implications.

Furthermore, the WHO Technical Advisory Group determined that detection and reporting must be carried out by members of the community; this implies that if the detection and reporting of events are performed by individuals outside of the community, the process cannot be described as CEBS.

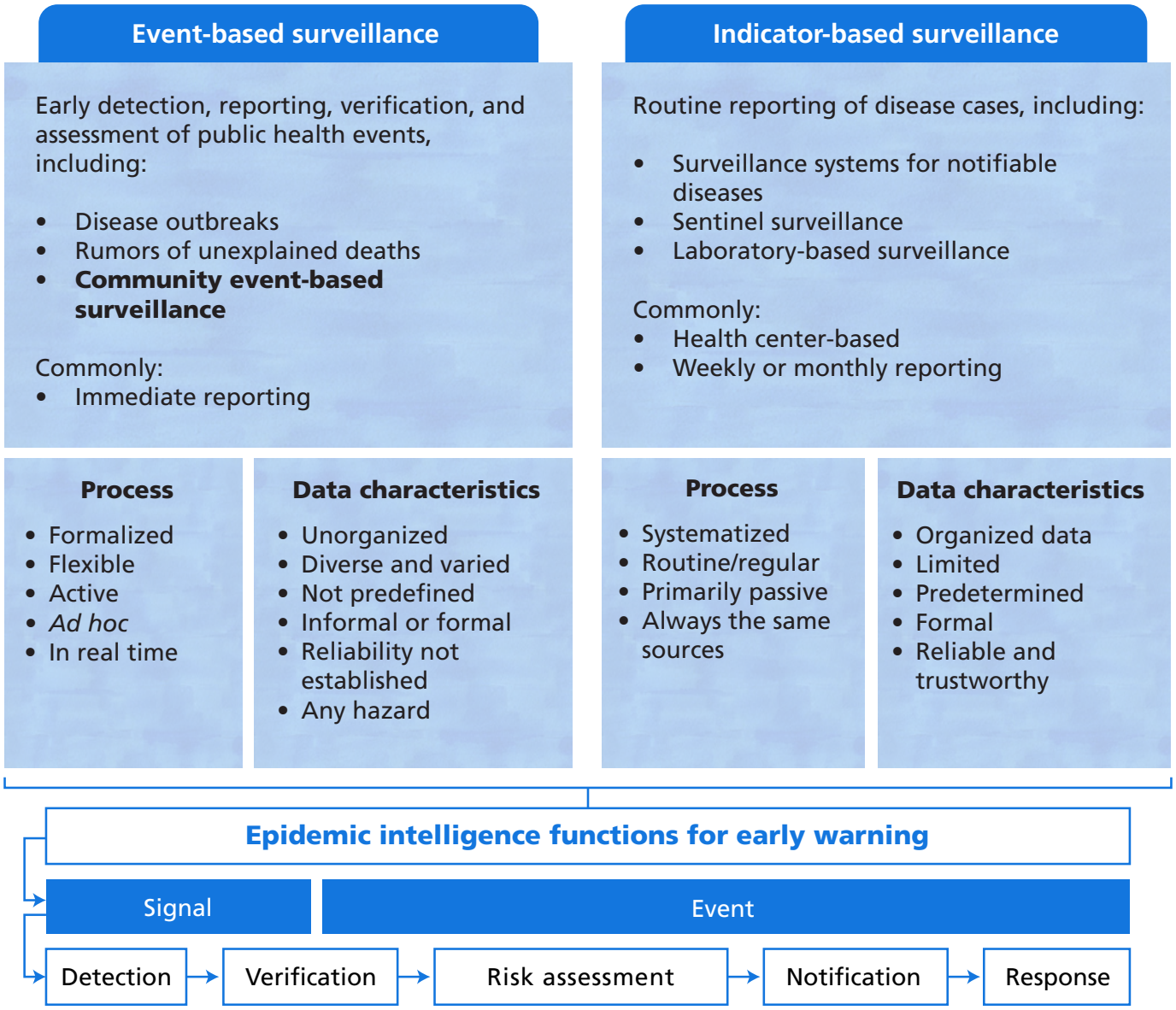
The following characteristics, considered hallmarks of robust CEBS and previously defined by the aforementioned WHO Technical Advisory Group in 2018, were adopted for this guidance. They establish that CEBS must:

- be integrated into a formal surveillance structure;
- be adapted to the context;
- be timely;
- offer perceived benefits for the community;
- include well-defined reporting and feedback mechanisms;
- include a monitoring and evaluation process; and
- ensure confidentiality of information.

CEBS regards the community as a source of data or information that the early warning and response system deems as indicative of a potential acute risk to human health (a *signal*). Once identified, the signal originating from the community must be verified; if confirmed, the signal becomes an event. A public health event that has been substantiated, assessed for its risks, and requires an intervention, constitutes an *alert (12)*.

CEBS is an integrated approach within event-based surveillance and contributes to epidemic intelligence for early detection, warning, and response systems (**Figure 1**).

Figure 1. Community event-based surveillance as a component of event-based surveillance



Source: The authors.

Basic components of community event-based surveillance

CEBS is comprised of several components:

- the community as an actor that provides information and is mobilized for the response;
- the health authority as the entity responsible for the surveillance system and the institutions tasked with mobilizing;
- an effective communication system;
- an information management mechanism; and
- a monitoring and evaluation process.

The *community* plays a central role in detection and reporting. These activities can be carried out by any member of the community or through community agents serving as informants, community leaders, or other individuals designated by the community. The mechanisms through which the community participates in surveillance vary and can be adapted to the needs and context of each country or subnational level.

For the purposes of this guidance, the definition of a *community agent* for CEBS is adapted to refer to a person chosen or recognized by their community who identifies signals of potential public health events, either directly or through information provided by community members, and working in coordination with health personnel and other social actors *(13)*.

Health authorities, whether national or subnational, manage and respond to reports, coordinate with the community, provide guidance, and establish protocols. It is important to highlight the need for coordination among various institutions (e.g., community-based organizations) and sectors (e.g., animal and environmental health) in order to optimize the exchange of data and knowledge, harmonize tools and adopt interoperability approaches, facilitate the response, and avoid duplication of activities within the community *(10)*.

An adequate *information management mechanism* enables the recording of reports and appropriate follow-up, and integrates with the country's alert and response system. A seamless two-way communication system is essential for transmitting timely information that is culturally appropriate for the context.

A *monitoring and evaluation framework* facilitates strategic planning, resource management, and continual improvement of the processes.

For countries planning to implement CEBS, it is recommended to leverage existing national or local structures and mechanisms, both institutional and community-based.

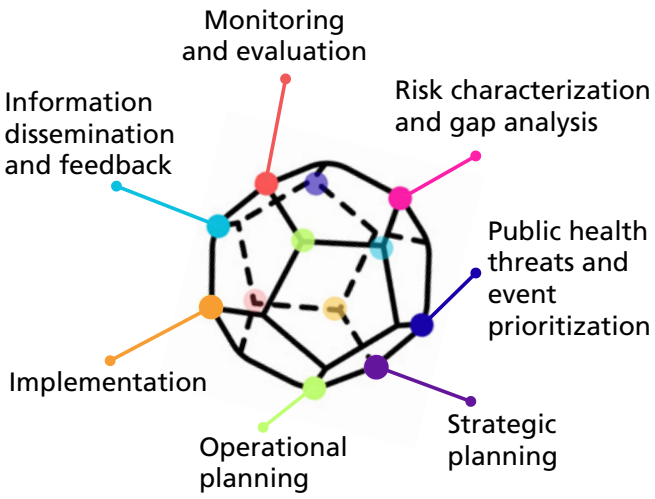
Phases of the community event-based surveillance process

This guidance proposes the following phases for establishing or strengthening CEBS:

1. Risk characterization and gap analysis
2. Prioritization of public health threats and events
3. Strategic planning
4. Operational planning
5. Implementation
6. Information dissemination and feedback
7. Monitoring and evaluation

It is important to note that the implementation of these phases does not necessarily need to occur in this exact order, since it depends on planning capacity as well as the development of technical and operational capabilities at the national and subnational levels. Furthermore, information dissemination and feedback, as well as monitoring and evaluation, are cross-cutting themes that occur across all phases (**figure 2**).

Figure 2. Interconnected phases of community event-based surveillance: a dynamic, non-sequential process including cross-cutting components of information dissemination and feedback, and monitoring and evaluation



Source: The authors.



2. RISK CHARACTERIZATION AND GAP ANALYSIS

Characterizing the risks and conducting a gap analysis, at either the national or subnational level, must precede any process of establishing or strengthening CEBS.

Risk characterization aims to identify, assess, and manage potential risks to a community or geographical area, such as related to infectious disease incidence and outbreaks, chronic disease prevalence, environmental risk factors, and chemical, nuclear, or zoonotic threat, thereby helping to understand the risk distribution across populations.

Risk characterization can combine the impact and likelihood of various public health events occurring; these elements may be derived from risk assessments conducted at the national or subnational levels. Identifying these risks provides a basis for prioritizing the signals reported by community agents in the context of CEBS.

A public health situation analysis of potential public health emergency scenarios helps to elucidate information such as the population's health status and potential public health threats it faces, as well as how the health system operates and responds. This type of information is key to guiding the implementation of CEBS in such contexts.

The gap analysis aims to compare the existing and expected elements related to the early detection, warning, and response system following the establishment or strengthening of CEBS. To identify the gaps and needs, the following elements should be considered:

- Surveillance system coverage
- Timeliness
- Sensitivity
- Regions with underreporting or no reporting
- Communities or population groups with limited access to health services
- Vulnerable population groups
- Areas considered high-risk for epidemic-prone diseases with pandemic potential, within the context of a multisectoral approach.

It is important to identify any gaps in communication, reporting, response, and monitoring mechanisms within health and public health institutions, as well as in other sectors including areas promoting community participation at national or subnational levels. The process should consider the background or context of community engagement and its level of development.

This gap analysis can help identify human, financial, infrastructure, and process-related needs that would improve public health surveillance capacities at national and subnational levels, with a focus on CEBS. In some instances, such as those with limited institutional capacity and/or community organization, countries could consider a phased approach to addressing the needs for the gradual implementation of CEBS.

Risk characterizations and gap analysis is a dynamic process that should align with new information arising from national or subnational risk assessments, as well as newly identified gaps, based on the elements described in this section.



3. PRIORITIZATION OF PUBLIC HEALTH THREATS AND EVENTS FOR SURVEILLANCE

Risk characterization and gap analysis will help determine which geographical areas, populations, and events should be covered by CEBS. Since community event-based surveillance can be particularly useful for public health events requiring timely detection and response, diseases with epidemic and pandemic potential should be given special consideration during the prioritization process.

In addition to the risk characterization and gaps identified, the needs perceived by the community must also be considered. Community engagement, and collaboration with community-based entities, is crucial to ensure acceptance and participation. It is recommended that the prioritization process includes relevant sectors whose input is important for establishing or strengthening CEBS.

In general, the events selected through prioritization should meet one or more of the following criteria:

- Risk to public health.
- Alert regarding a national situation or international emergency, particularly in border areas.
- Potential to become a national or international public health emergency.
- Requires multisectoral action, with potential impact on the environment, animals, food, and/or humans.
- Easily identified or detected by the community.
- Feasibility of the response amongst health institutions.
- Feasibility of linking with services (whether in the health or other sectors) that are capable of verifying community reporting and taking the necessary actions.
- Level of community involvement or participation.

During the process of prioritizing public health threats and events for surveillance, it is possible that some communities may be identified that have limited institutional engagement and response, and/or where the level of participation is nonexistent or is still in the early stages. These contexts should be considered, as they can signify greater vulnerability and increased risks. They should not be used, however, to justify the exclusion of these communities; as mentioned in the previous section, addressing the needs in these contexts will require progressive resource management.

The outcomes from the prioritization process should be used to inform the subsequent phases of establishing and strengthening CEBS. It is also recommended to integrate and reflect these priorities into public policies and the various regulatory and legal frameworks governing public health surveillance, particularly those related to CEBS and/or community participation.



4. STRATEGIC PLANNING

Strategic planning for CEBS is important to provide a long-term roadmap for determining the key objectives and outcomes, which are then implemented through operational plans. Strategic planning not only guides the establishment or strengthening of CEBS, but also facilitates advocacy and resource mobilization at the national and subnational levels and through partners by helping to identify long-term management and investment needs. Furthermore, it fosters high-level political and institutional commitment and helps maintain sustained multisectoral alignment over time.

For strategic planning, surveillance is considered an essential public health function led by each country's health authorities across various administrative levels; this responsibility cannot be delegated to other entities. However, this activity is not exclusive to the health sector and, therefore, coordination with other governmental sectors and community structures are essential for sustaining intersectoral action and implementing CEBS *(14)*.

Defining objectives

Each country should define their objectives for CEBS based on the risk characterization and gap analysis of existing surveillance and response systems.

When designing or adapting CEBS, the expected sensitivity and coverage should be taken into account, as well as the capacity for coordination with health institutions' response protocols and with other stakeholders.

The following is a list of objectives that health authorities and stakeholders may consider using or adapting for CEBS:

- Improve the timely detection and verification for the early warning of signals of potential public health events, including diseases with epidemic or pandemic potential.
- Increase the sensitivity of the public health surveillance system by involving the community in the surveillance process.
- Expand the coverage of the public health surveillance system for early warning and response.
- Foster community adherence to recommended public health measures for controlling or mitigating public health events or outbreaks.

Stakeholder mapping

Stakeholders are parties who have an interest in the process of establishing or strengthening CEBS, or those who may exert some influence over it. Stakeholder mapping provides insight into stakeholders' perspectives, affiliations, and the areas they represent, as well as their interests or viewpoints with regards to establishing or strengthening CEBS *(15)*.

It is essential to identify the various governmental and nongovernmental stakeholders that implement and/or plan the initiatives, policies, programs, or projects that incorporate the components of CEBS. This mapping should include community structures and organizations, as well as their interactions and relatedness with public health programs and those from other sectors.

Stakeholder mapping ensures the early inclusion of the various stakeholders who will participate in implementing CEBS, thereby fostering a multisectoral approach aligned with the risk characterization and gap analysis and prioritization of public health threats and events phases. Early engagement with community structures and organizations will facilitate the adoption of CEBS, provide a community-centered perspective, and empower individuals and communities.

Advocacy and stakeholder mobilization

Advocacy aimed at engaging stakeholders from the earliest stages of strategic planning is essential for fostering the establishment or strengthening of CEBS. Through such advocacy, stakeholders can develop, incorporate, tailor, or adapt programs or initiatives with the active participation from communities. This mobilization to establish or strengthen CEBS will enable complementary activities, the efficient use of resources, and cooperation with the community.

The following are some key points regarding advocacy and stakeholder mobilization for CEBS:

1. **Integration into the national public health surveillance system:** This entails incorporating a CEBS component into the national surveillance system, with guidelines defining its role, objectives, and procedures, as well as linking community-level reporting and verification with the early warning and response system. Failure to integrate and link these elements leads to parallel, disconnected processes that duplicate functions and delay appropriate intervention.
2. **Recognition in other national plans:** Efforts should be made to ensure that community event-based surveillance is recognized or included in national emergency and disaster prevention and management plans, as well as in disease eradication, elimination, and control plans, amongst others.
3. **Linkage to healthcare services:** Pathways or protocols must be established to ensure that individuals affected by a signal detected through CEBS receive the necessary care. These mechanisms must also facilitate the verification, or confirmation, of the signal, thereby enabling the appropriate public health surveillance and control programs (e.g., immunizations, vector control, etc.) to implement the respective interventions. Failure to establish this process can negatively affect the trust with the communities, the level of participation, and the perceived benefits of CEBS.
4. **Formalization of multisectoral and/or multi-stakeholder collaboration and coordination:** Countries should consider creating or strengthening formal coordination and collaboration mechanisms to advance and ensure the sustainability of CEBS. These mechanisms would facilitate the integration of information gathered from the community, triangulation with other surveillance sources (e.g., animal health, environmental, education), and coordinated responses involving local governments, organizations, and community structures. In some contexts, creating partnerships among stakeholders working within the community may be considered. These mechanisms facilitate the exchange of information and experiences.
5. **Integration with community structures and processes:** CEBS can be a component of activities carried out at the community level. Therefore, there is a need for integration with, and support from, existing community structures and processes. For example, a national community engagement program might include components of health planning, risk communication, and surveillance.
6. **Joint processes:** Some countries already have CEBS processes in place. For example, communities may already monitor morbidity and mortality (including maternal or infant mortality, malnutrition, malaria, etc.); in such cases, CEBS could be integrated into these processes.
7. **Integration with health promotion and well-being initiatives:** In some contexts, coordination with other sectors promoting national health and well-being initiatives

(e.g., initiatives to combat poverty and malnutrition) should be leveraged, thereby establishing CEBS as an integral part of community health and well-being. CEBS facilitates community mobilization and enables communities to work alongside organizations to address specific issues and enhance preparedness for an effective response to public health events.

8. **Alignment with public health information system policies:** It is important to align with national entities responsible for managing public health information tools that can support CEBS in order to enable the timely exchange of information amongst stakeholders, in accordance with national and subnational guidelines. This collaboration will promote data quality and standardization, as well as the ethical management of data.

Governance

Governance refers to the processes, structures, and institutions established to oversee and manage a country's CEBS system. It manages the relationships amongst the various stakeholders involved in establishing or strengthening CEBS, including multisectoral government institutions, healthcare providers, individuals, communities, civil society organizations, and private sector entities *(16)*.

Governance of CEBS involves ensuring that strategic policy frameworks are in place along with effective oversight, coalition-building, appropriate regulations and incentives, a carefully designed approach, and accountability.

It is important to consider formalizing a governance body to coordinate with stakeholders for establishing or strengthening CEBS. This governance structure should include participation from health authorities and authorities from other government sectors, as well as representatives from community organizations and structures. The health sector should be the lead for CEBS, in accordance with its institutional structures.

Establishing or integrating with other coordination mechanisms, such as multisectoral collaboration agreements or partnerships that formalize cooperation amongst relevant sectors and stakeholders, is recommended. Formal documentation endorsed by the participating sectors helps to ensure commitment to establishing or strengthening CEBS.

When CEBS involves the participation of indigenous populations, other ethnic groups (e.g., Raizal, Roma, etc.), people of African descent, populations defined by cultural or national identity, or vulnerable groups, the sectors responsible for their health and well-being must be included.

Intercultural dialogue (knowledge dialogue) *(17)* is key to ensuring inclusive and respectful governance processes that promote coordination between institutional health systems and the communities' own practices. Therefore, it is essential to review the institutional frameworks regulating the government's interaction with communities in order to leverage these efforts for empowering communities in CEBS.

Adapting the institutional and legal framework

Countries should develop or update their respective national guidelines or protocols for CEBS, and integrate them into the national surveillance system and health information systems.

Additionally, once the objectives, processes, and stakeholders involved in CEBS have been defined, it is necessary to assess whether existing national and/or subnational policies and legal and administrative frameworks must be adapted in order to facilitate the establishment and strengthening of CEBS. Integration of CEBS into public health surveillance initiatives will also support this process.

National policies regarding the health workforce must consider the personnel needed to implement CEBS in a sustainable and efficient manner. Furthermore, policies regarding healthcare services must also define the process for management of potential cases identified through community-reported signals.

National policies regarding health information systems should be reviewed and/or adapted to ensure that CEBS is formally recognized and integrated into information system governance frameworks. This entails defining institutional responsibilities and interoperability criteria so that information reported from the community can be used for decision-making while ensuring data protection guidelines and ethical considerations are adopted.

Existing national or subnational legal frameworks designed to promote community participation can be leveraged to incorporate provisions that help establish or strengthen CEBS within its scope. Similarly, CEBS should be made visible and included in relevant government, development, and sectoral plans (such as disease elimination plans).

It is recommended that other government sectors consider adapting their institutional and legal frameworks to facilitate multisectoral action and an ethical approach to community engagement, thereby enabling the establishment or strengthening of CEBS.

Resource allocation

After integrating CEBS into the relevant coordination frameworks for stakeholders, it is essential to review joint resources available and consider how to utilize them to establish and strengthen this surveillance. This ensures the gradual execution of operational planning and the implementation of CEBS with the necessary human, material, and financial resources, including the development of public health information management tools.

Where the legal and institutional frameworks allow, resources should be decentralized so that subnational authorities can establish or strengthen CEBS, tailored to their specific contexts, and sustain it over time. Similarly, autonomous or decentralized subnational entities should consider allocating resources to aid and assist in the sustainability of the operational planning and implementation of CEBS.

Establishing CEBS allows for opportunities to leverage commitments from all stakeholders, including government sectors, as part of strategic planning. This enables the identification of resources from other institutional initiatives, external contributions, donations, and other sources. For instance, resources may be available within national or subnational institutions tasked with promoting community participation or social integration; these resources could be considered for CEBS in the interest of government efficiency.



5. OPERATIONAL PLANNING

Operational planning for CEBS covers a short-term time frame (annual or biennial), during which key deliverables and specific activities are defined to enable progress towards strategic objectives. It focuses on implementing immediate priority actions that directly contribute to the outcomes outlined in the strategic plan. This phase facilitates the establishment or strengthening of activities that would be monitored and evaluated within set timeframes, ensuring accountability of their implementation and promoting clear, concrete actions deriving from the strategic plan.

Operational planning should include the following stages: a) defining roles and responsibilities for the entities and stakeholders involved in implementation; b) determining mechanisms for coordinating activities amongst the various entities, across sectors and levels; c) assembling teams, d) developing the training plan; e) engaging the community; and f) providing technical guidance and operational support.

Defining roles and responsibilities

Once the stakeholders participating in CEBS have been identified, their roles and responsibilities related to implementation should be defined. In this respect, the mandates or competencies defined under existing legal frameworks should be considered for each entity. During this stage, it is essential to reflect the roles and responsibilities of the entities implementing public health programs or initiatives that involve community engagement, as well as the commitments made to all stakeholders, including various government sectors.

Each country will adapt stakeholders' roles and responsibilities for CEBS based on the objectives established during strategic planning. It is important to consider the various administrative levels when assigning roles and responsibilities.

Assigning roles and responsibilities requires a comprehensive view of the entire CEBS implementation process and the stakeholders involved, ranging from selecting the surveillance model, the development of guidelines, and the inclusion and empowerment of community agents, to the detection and reporting of signals, conducting risk assessments, and carrying out the public health response. The methods for each phase of implementation, as well as which stakeholders should or may participate in each phase and what their roles are, should be defined.

Annex 1 provides a table (**Table A1.1**) summarizing the potential list of roles and responsibilities that could be assigned across the relevant administrative levels for each phase of CEBS.

Coordination mechanisms

Given the involvement of various stakeholders CEBS, it is important to consider the coordination mechanisms for conducting the planning, implementation, monitoring, and evaluation activities. Options could include establishing an operational unit, a task force, multisectoral working groups, and sectoral technical committees.

Processes should be established to facilitate coordination with institutions in other sectors that conduct CEBS activities or that are responsible for responding to relevant public health threats. It is also important to ensure that coordination mechanisms with healthcare services are triggered in a timely manner.

Digital collaboration platforms can be useful tools to facilitate coordination processes,

including for communication and management of CEBS amongst the various stakeholders. These platforms can enhance the transparency and efficiency of implementing and monitoring CEBS.

National and subnational authorities should consider establishing a national network of community agents for CEBS to facilitate the exchange of experiences, lessons learned, and challenges. This network would foster interactions with stakeholders to establish or strengthen CEBS.

Assembling teams

National or subnational health authorities are responsible for the logistics and operations for CEBS, in line with the country's organizational structures and administrative divisions.

CEBS teams should be established based on the priorities and gaps identified. These teams should operate in coordination with the delivery of healthcare services, public health surveillance and early warning teams, and other programs or initiatives that actively involve the community, different sectors across administrative levels, and other stakeholders. It is expected that these CEBS teams are available at the subnational level.

At the national level, CEBS teams must be comprised of person(s) assigned to oversee its implementation, as well as designated personnel from public health surveillance teams, early detection, warning, and response systems, and public health and environmental health programs, amongst others, depending on the relevant sectors. These teams should maintain continuous interactions with the various stakeholders identified, including representatives of health and well-being initiatives for populations defined by cultural or national identity or for vulnerable groups; representatives of community structures and organizations; and academic personnel, amongst others.

A similar structure should be considered at the subnational level, adapted to local competencies and capacities. Depending on each country's needs, other technical and professional profiles, as well as stakeholders, may be included in the teams (e.g., health information system specialists, social scientists, ethnolinguists, religious groups, etc.).

National and subnational authorities are encouraged to develop and/or strengthen mechanisms to train members of CEBS teams on a regular basis, aligned with the operational plans.

Developing the training plan

Once the CEBS process has been defined, it is necessary to design a comprehensive training plan based on strategic and operational planning. This plan will target both the healthcare personnel involved throughout the implementation process (detection, reporting, risk assessment, and response), and the participating community agents. The plan should outline the overall and specific objectives, the target audience, the methodology to be used, the training content, and the necessary resources. Training community agents may require a "training of trainers" approach to expand coverage.

Community agents must be trained in a manner that considers their educational level and digital literacy, language, beliefs, worldview, and how their community is organized and functions. Adapting the training in this respect is essential to building trust among community members and integrating them into the

reporting network. Community agents will receive training on the health system, the roles of other stakeholders, how the surveillance system functions, and the specific process for monitoring signals. The use of continuing education tools can facilitate this process.

The plan should also incorporate practical exercises or simulations to enhance learning; the development of educational resources for training community agents; and the use of tools that could be used to inform the community on how to identify signals. Educational materials must be adapted and translated through a process of intercultural dialogue with the community. Community agents must receive training on how to use and interpret information generated through community reporting processes, as well as how this information integrates with public health surveillance data.

The training plan should also consider the participation of other stakeholders, depending on the national context. This may include institutions responsible for delivery of healthcare services, health information systems, as well as community structures, amongst others.

Community engagement

The community is the driving force behind the CEBS strategy. Raising community awareness regarding its role is key to ensuring success. Communities vary in their level of engagement, ranging from no or limited involvement, to more extensive involvement in which the community works continuously alongside institutions or even leads management efforts within its own area. An earlier impact is expected in contexts with higher levels of participation, e.g., in communities that are self-managed and mobilize themselves in response to health issues.

Mechanisms for community participation should be promoted at all national or subnational levels where there are plans to establish or strengthen CEBS. Professionals that are involved with CEBS need to be able to understand the specific context of each community, including how it is organized and functions, its level of participation in various institutional processes, and its prior experience with detecting and reporting signals. Intercultural dialogue can help to tailor the approach for each community.

National and subnational authorities are encouraged to identify existing instances of community participation, particularly those involving CEBS, in order to gather insights, lessons learned, and best practices related to community engagement.

Methods and approaches for community engagement may vary depending on the context. In some areas, personal interviews with community leaders or advisors may be needed; in others, community assemblies, committees, or other types of meetings may be needed. It is important to note that community engagement is rarely a short-term process; it requires persistence, trust building, and a deep respect for the community and its context, beliefs, and culture.

Regardless of the surveillance model used, it is essential to inform the entire community about the signals being monitored, the importance of reporting through the established mechanisms, and the initial recommended measures. This information can be shared through talks, workshops, and community meetings, as well as through visual materials, social media, and messages or interviews on community radio or television. The community should be informed of the benefits or incentives of surveillance (e.g., triggering a response mechanism when verifying a signal).

CEBS teams should leverage coordination mechanisms to facilitate communication, feedback, and ongoing dialogue with the community and its community agents. The community should be informed of how the surveillance system works, the achievements, and the activities in which the community can participate to improve the health of its members.

Technical and operational support

Technical and operational support is an essential component for the effective implementation of CEBS, and enables monitoring and evaluation, the identification of opportunities for improvement, and the documentation of best practices and lessons learned.

Technical and operational support should be continuous, focusing on activities, the level of community participation, the proper flow of information, and the appropriate interventions in response to reported signals. This support should be provided to CEBS teams as well as community agents and community structures. Support regarding signal detection and reporting may occur on a weekly or bi-weekly basis, while the review of information flow, response measures, and community participation may be conducted on a monthly or quarterly basis. During outbreaks or epidemics, daily monitoring of reports may be required.

CEBS teams should receive technical and operational support from the coordinating entity responsible for surveillance planning. In turn, the community event-based surveillance teams can then provide ongoing technical and operational support to community agents and community structures to facilitate the interventions and responses for reported signals.



6. IMPLEMENTATION

Once the national-level planning for CEBS has been established, including links with the existing public health surveillance systems, operational processes, and the stakeholders involved, the implementation phase can begin. A pilot program to test the processes and procedures may be considered for a few selected areas, which can allow for adjustments to be made prior to expansion or scaling up. The pilot program would be conducted for a limited period, followed by an evaluation. Stakeholder participation in this evaluation is crucial to ensure that CEBS efforts align with the defined priorities and address the identified gaps and needs.

As a part of CEBS implementation, this guidance will cover the selection of the surveillance model, the engagement of community agents, the detection and reporting of signals, the verification of signals, risk assessments, and the response (i.e., implementation of interventions). Additionally, the experiences gained and lessons learned throughout the implementation of CEBS should be used to update and optimize its processes.

Selecting the surveillance model

The surveillance model includes the basic components for implementing CEBS. At the national and/or subnational level, a decision can be made to apply a single model throughout, or adapt it to the needs and priorities of each subnational level. Furthermore, the selected model can be adapted to situations requiring enhanced surveillance or for implementation in particular contexts, such as temporary shelters and mass gatherings.

The operational model for CEBS is comprised of two interrelated elements: 1) the type of community reporting, and 2) the setting in which surveillance will be implemented (**Table 1**).

Table 1. Components and characteristics of the surveillance model for community event-based surveillance

Component	Characteristics
Type of community reporting	• Passive: Spontaneous reporting by community members. • Active: Door-to-door searches or outreach during community meetings by a community agent. • Reactive: In response to emergencies or outbreaks. • Proactive: Intensified active case-finding.
Setting	• General: The entire population, without specific boundaries. • Specific population groups: Rural populations, migrants, and travelers. • Temporary shelters: Related to emergencies. • Mass gatherings: Religious, cultural, sporting, and community events.

Source: The authors.

Reporting is the process by which a community member directly informs health institutions, or the designated community agent, about a signal. *Passive reporting* is when signals are detected and reported spontaneously by community members. Conversely, *active reporting* is when a community agent visits households or meets with the community to potentially identify signals. Active reporting is classified as *reactive* when it is in response to an outbreak or emergency, and as *proactive* when it involves active case-finding.

The *setting* refers to the population or context for which CEBS is implemented. *General surveillance* is when the entire community has agreed to participate and is part of the surveillance system. CEBS can also focus on *specific population groups*; for example, those in remote or hard-to-reach rural areas, along migration routes, or travelers, migrant workers, indigenous peoples, ethnic minorities, Afro-descendant communities, groups defined by cultural or national identity, or vulnerable populations. Other settings may include *temporary shelters* established during natural or human-made emergencies, as well as *mass gatherings*, whether religious, cultural, sporting, or community events.

Reactive surveillance may be implemented during outbreaks, when a more sensitive surveillance system is needed and additional community participation is solicited. For instance, in an area where CEBS is already established, passive surveillance in temporary shelters may be added as part of the response to an emergency caused by a natural disaster.

Another option is to rely on *community sensors*—individuals capable of detecting unusual situations. A community sensor is a community member whose role within the community enables them to detect signals. Some examples include:

1. A health worker who detects a signal in the community where they live, outside of their work responsibilities;
2. A pharmacist who notices an increased demand for influenza medications;
3. A priest, pastor, teacher, or supervisor who notices that notices a rise in absenteeism at their workplace;
4. A group of student leaders from a school attended by students from different areas who can detect signals from different geographical areas;
5. A moderator of an online forum or social media network, or a community of practice coordinator, who can identify a signal circulating within those communities;
6. A community agent who uses social media to supplement detection efforts, engaging with members of the communities they serve. In this respect, they can detect, through social media messages or status updates, signals that should be reported.

In certain situations, such as those involving disease elimination, control strategies, or during public health emergencies, CEBS can be linked to sample collection or rapid testing conducted within and by the community (e.g., for malaria, tuberculosis, HIV infection, hepatitis B, or COVID-19). These detection activities must be recorded and managed in accordance with established national protocols.

The choice of the CEBS model should take into account the expected level of community participation. In communities with high levels of participation and management capacity, a specific set of signals that should be reported can be established. A network of community agents can also be organized to cover both urban and rural areas. In contexts where community

participation is limited, implementation can begin in pilot areas or with a select number of signals, and can be expanded gradually based on the outcomes. In situations involving regional or national alerts, surveillance for a single signal can be implemented; this approach is also useful for migrants or travelers entering or returning to a territory.

Community agents can operate as part of a network within community structures or across different communities (e.g., those in close geographical proximity). This network can support the implementation process; for instance, one community agent can report information to another in order to facilitate the initial triage and coordination amongst the various stakeholders involved in the health interventions and institutional response (such as healthcare, public health surveillance, environmental, and animal health interventions). This model should be integrated into both the public health surveillance system and the primary health care system.

Preparation of key documents

National or subnational authorities should plan for the preparation of key documents for implementing CEBS. These documents will need to outline the implementation processes, including the detection and reporting of signals, verification, risk assessment, and the implementation of appropriate interventions. Examples of key documents include:

a. **Surveillance protocols:** Signals that are prioritized for CEBS should be included as a specific component or chapter within the surveillance protocols.
b. **Community agent guidelines:** A document providing general instructions on ethical conduct for community agents and outlining processes related to surveillance protocols. These guidelines should address both individual and collective actions for each detected signal under surveillance.
c. **Multisectoral protocols:** Adopting joint protocols with stakeholders can facilitate multisectoral coordination by establishing shared procedures and standards.
d. **Early warning or epidemic intelligence procedures *(9)*:** A document describing how a signal detected by communities is integrated into the national or subnational early warning system or epidemic intelligence framework. These procedures may include the use of shared dashboards and/or other digital tools.
e. **Adaptation of procedures or protocols from other institutions involved:** This entails adjusting procedures to improve the integrated health service networks or to optimize the flow of information from the surveillance system to health information systems.

Protocols and procedures should specify how the implementation processes are integrated with the healthcare system, as well as the corresponding institutional responses. They should also define the individual and collective actions expected from the community and community structures.

Guidelines for community workers should provide clear instructions on how to detect and report a signal, and how to support affected individuals and their communities through promoting individual, family, or group activities. These materials should include illustrative resources showing how to recognize signals and the immediate actions to take, serving both as a reference tool and a means of communicating with the public.

Integrating and empowering community agents in community event-based surveillance

Community agents are volunteers recognized by their community, whether for their leadership in social activities (in general and specifically regarding health issues), or for their capacity-building potential in areas with limited community participation. The community designates them to report signals as part of CEBS. Since they are volunteers, it is essential to ensure that they receive the necessary support for facilitating and optimizing their work.

As referenced in the "Surveillance Model" section, integrating the community agents as part of a structured network, ideally with its own identity or name (e.g., the "National Community Event-Based Surveillance Network"), can increase their adherence and commitment to CEBS. These types of networks facilitate sustainability, expanded coverage, local ownership, and social mobilization. The use of logos or identifying symbols strengthens a sense of belonging and increases the network's visibility. Each community agent must be formally registered with the respective institution responsible for providing support at that subnational level, and therefore ensuring their inclusion in the network's national registry. This ongoing support is key to the success of CEBS.

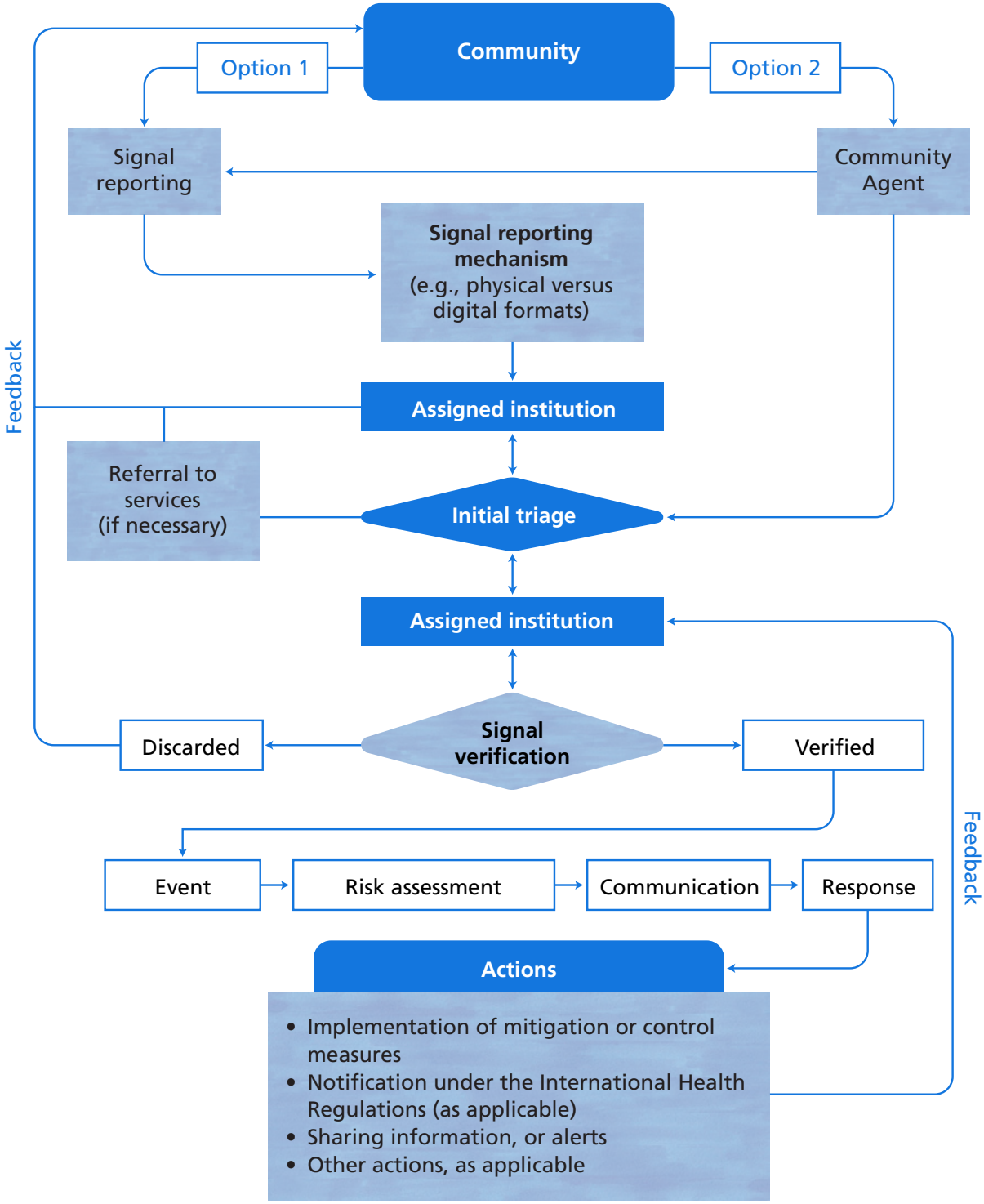
Community agents can be motivated through incentives such as access to continuing education, participation in experience-sharing meetings, public recognition within the community, and vocational training. It is also recommended to provide support in the form of communication equipment, access to basic services for surveillance (e.g., mobile data), and resources for travel when needed.

The geographic and/or community assignments for community agents should align with the operational planning and stakeholder coordination mechanisms, including the relevant sectors and community structures.

All community agents should be included in the training plan and have access to continuing education resources for CEBS, including simulations designed to optimize their work.

Once the surveillance model has been selected and reviewed, the key documents have been prepared, and the community agents have been integrated, the necessary elements for epidemic intelligence are considered to be in place for CEBS, including reporting, triage, verification, risk assessment, and response. A graphical representation of this process is shown in **Figure 3**.

Figure 3. Suggested information flow and verification process for signals derived from community event-based surveillance



Source: Figure prepared by the authors based on concepts from: World Health Organization. Early detection, assessment and response to acute public health events: Implementation of early warning and response with a focus on event-based surveillance (Interim version). Geneva: WHO, 2014. Available from: https://iris.who.int/handle/10665/112667.

Signal reporting

Reporting is defined as the formalized process for which signals identified by the community are communicated, either directly to health authorities or through a community agent, within the national or international surveillance system framework *(12)*.

Signal classification

Examples of signals that should be reported, referred to as *reportable signals*, may include:

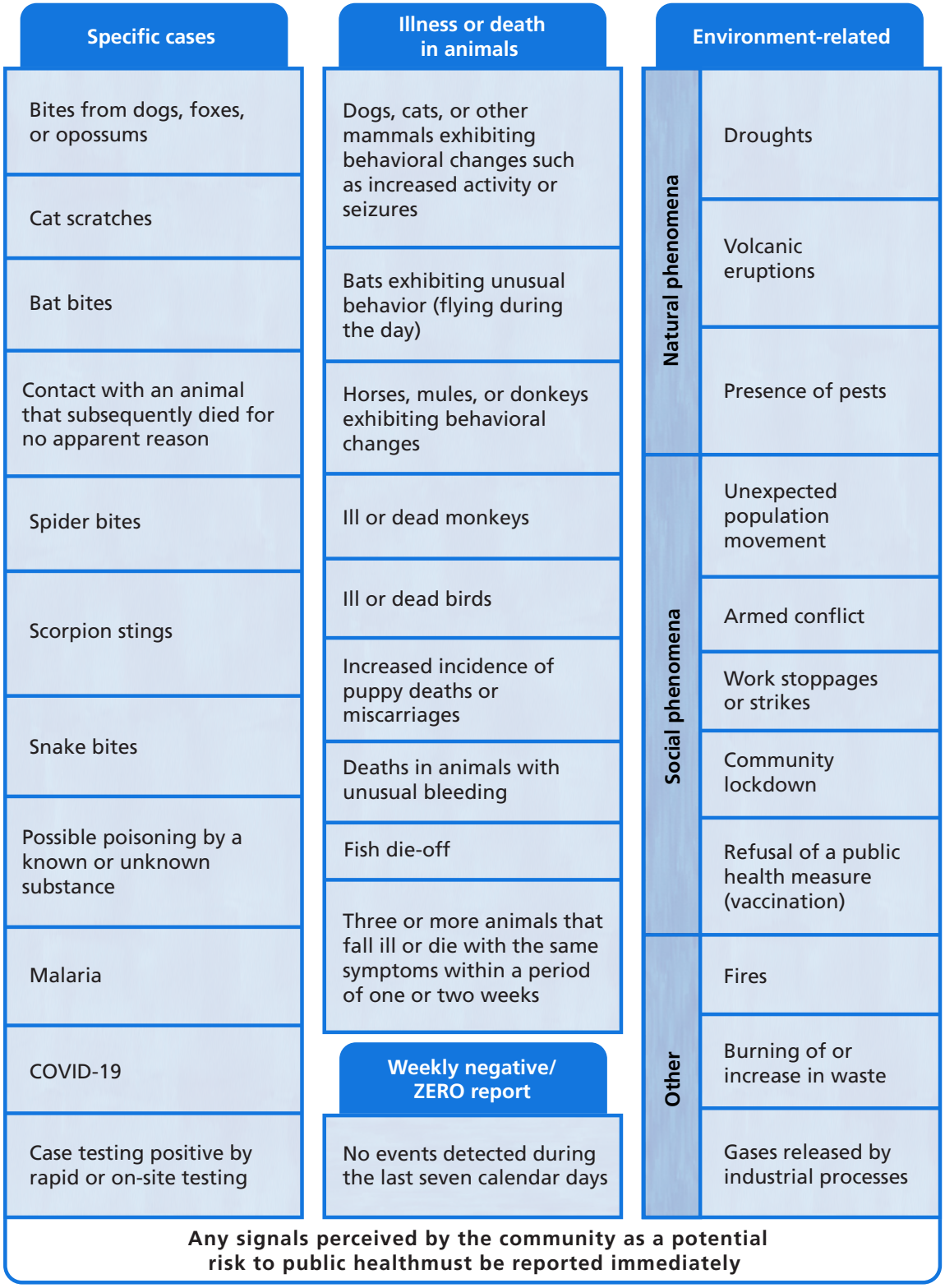
1. A particular set of symptoms, or clusters of symptoms.
2. Deaths in the community.
3. Specific cases, in particular instances (e.g., malaria, COVID-19, etc.)
4. Illness or death in animals.
5. Environmental-related signals: Unusual situations within the community's surroundings perceived as risks or causes for concern, including those related to water sources, natural or social phenomena, or events due to other origins.

Each national or subnational authority may add reportable signals, considering the risk characterization, public health threat prioritization, and the level of participation by the community and community structures as well as by other stakeholders. Any other signals perceived by the community as a potential risk to public health should also be reported immediately.

Table 2 provides a summary of these reportable signals. Additional descriptions and examples of these types of signals are included in **Annex 2**.

Table 2. Proposed classification of reportable signals

Set of symptoms	Deaths in the community	Clusters	Environment-related	
Fever and severe influenza (with difficulty breathing, chest retractions, lethargy, or chest sounds)	Two or more deaths from an unknown illness accompanied by a fever	Three or more individuals who fall ill with the same symptoms within a period of one or two weeks	A situation occurring within the community environment that is unusual and perceived as a risk or cause for concern	
Fever and severe diarrhea (three or more profuse watery stools, refusal to eat, dehydration, crying without tears, chest retractions, watery stools containing blood)	Increase in deaths over the past 15 days	Two or more people requiring emergency care or hospitalization with the same symptoms within a period of one or two weeks	Water sources	Naturally occurring water contamination
Fever and skin eruptions (rash, mottled skin, and breakouts)		Three or more people who fall ill and associate their condition with the consumption of food or water		Water contamination caused by human activity
Fever and bleeding (active hemorrhages from the nose, eyes, or skin; or blood in vomit or diarrhea)				Shortage of drinking water
Fever and neurological symptoms (seizures or convulsions, stiff neck, unusual behavior, or lack of mobility in the arms or legs)			Natural phenomena	Earthquakes
Fever and yellow skin (eyes, palms, and soles)				Floods, overflowing bodies of water, or flash floods
				Hurricanes



Source: The authors.

Reportable signals may be *individual* or *collective*. *Individual signals* correspond to a single person, animal, or situation, whereas *collective signals* affect more than one person, animal, community, or geographical area. National or subnational authorities should establish which standardized information should be collected, in accordance with public health surveillance guidelines.

Individual signals pertaining to humans may include information such as the date(s) of symptom onset and/or exposure, place of residence, and the initial classification of the signal (e.g., syndrome, deaths, a specific case, etc.). Animal health signals may include the location of the incident, the type of animal, and a description of the signal. Some national authorities may consider recording names

and other sensitive data to facilitate access to health interventions and response efforts, while ensuring confidentiality and data privacy protections. Environmental-related individual signals may include a description of the findings observed in water, air, soil, vegetation, or climatic conditions.

Collective signals may include the date(s) of symptom onset and/or exposure, location, type of signal, and a detailed description. The report should indicate whether multiple people or animals are affected (ideally providing a numerical value) and whether there have been any hospitalizations, referrals, or deaths. Environmental-related collective signals affecting more than one geographical area may include information on the extent of the impact, the duration, and proximity to the hazard.

In the absence of signals, a "*zero-signal*" reporting mechanism, or a weekly negative report, may be used; this helps to ensure that community agents remain active and maintains the reporting process at the subnational level. Through this report, community agents can inform their assigned institution that no signals have been identified in their assigned community during the relevant week or epidemiological period. However, to reduce the workload on community agents, the technical support staff at the assigned subnational level may also directly monitor zero-signal reporting.

Reporting mechanisms

Reporting may take various forms, depending on the specific context of each geographical area or community. When designing community signal reporting mechanisms, several factors should be considered, such as the level of digital literacy, the availability of cell phone service and electricity, the predominant language, cultural perceptions related to health and illness, and a general understanding of the processes involved.

The community signal reporting mechanisms should be simple and culturally appropriate for both the community and community agents. This involves the use of short physical or digital formats containing basic but practical information. It is essential to clearly define the information flow for reporting, beginning with the community members or community agents who detect the signal, and proceeding to the designated subnational or national level, in order to ensure integration with the established channels of the health system.

Various techniques can be used to incorporate additional elements such as photographs, voice recordings, videos, or detailed descriptive text. Technologies such as optical character recognition, speech-to-text and text-to-speech conversion, and artificial intelligence can transform these inputs (written text, verbal narratives, and images or videos) into structured records that can then be analyzed and integrated into the community signal reporting mechanisms and health information systems.

It is important to agree with the community, community structures, and other involved stakeholders, that the reporting mechanisms should not be used as a means to request unmet health services or to file related complaints or grievances. Institutions must inform the community about the appropriate channels for those issues.

Ethical considerations

In general, it is suggested that signal detection focuses on protecting communities, ensuring that information is collected only when necessary and is processed in a timely manner

in order to implement or adapt public health interventions in the communities under surveillance. In this respect, the collected information must be sent to the respective national and local authorities accordingly, and the data must be anonymized.

The means and mechanisms for signal reporting should respect the culture and worldview of the communities, and should be nonintrusive. Protecting confidential information is essential to avoid harming the reputation, dignity, or safety of individuals or health teams. It is recommended that the communities are engaged in order to verify whether these community signal reporting mechanisms are acceptable.

When providing technical and operational support, the assigned institution must ensure oversight of and compliance to ethical considerations by community agents, participating institutions, and other stakeholders.

Any CEBS process, whether carried out by institutional actors or the network of community agents, must guarantee the confidentiality of individual, family, and community information.

Signal triage

Following the detection of signals by the community or community agents, the next step is the signal triage process. This serves as an initial filtering to determine whether the detected signal lies within the scope of a reportable signal (i.e., meets the criteria for a reportable signal). Depending on what is detailed in the key documents governing the implementation of CEBS, this signal triage may be carried out by the community agents or the assigned institution.

If signal triage is carried out by community agents, the national or subnational authorities should define the criteria for reportable signals such that it can be easily understood and interpreted by the community agents based on their sociodemographic characteristics and competencies. These reportable signal criteria should align with the event-based surveillance guidelines at the respective national or subnational levels, along with other relevant documents. Examples include categorizing signals based on the occurrence of deaths or severe cases, identifying the impact of a disease on multiple species, or detecting contamination in bodies of water.

Conversely, if signal triage is carried out by the assigned institution or the early detection, warning, and response system, it should be in accordance with the national or subnational procedures and reportable signal criteria.

If a signal meets the reportable signal criteria established by the assigned institution or community agents, the next steps will be signal verification, risk assessment, and the response, as outlined in the CEBS implementation key documents.

If the established reportable signal criteria are not met, the assigned institution or community agents must facilitate access to the appropriate services. Assigned institutions may recommend that the community agent follow-up with the community member who made the report to rule out any changes to the signal that may require verification.

Signal verification

Verification involves confirming the authenticity, integrity, and accuracy of data in order to eliminate hoaxes, false rumors, and artifacts. It is an important step in CEBS, and is significant

not only due to the public health actions that are triggered once a signal is verified, but also due to the credibility that is gained within the community for CEBS as a result of rapid, effective verification. Therefore, it is necessary to define a maximum timeframe between signal reporting and verification.

The institution responsible for implementing CEBS should include the following steps as part of the signal verification process: the compilation and triangulation of information; consultation with peers, experts, and contacts; and a determination as to whether the signal can be verified. These steps foster a culture of continuous improvement and the effective use of information and data in epidemic intelligence.

Depending on the type of signal, verification may be the responsibility of the health sector or another sector. It is important to designate which institution will be responsible for verifying signals in advance. Depending on the type of risk, signal verification may be carried out through communicating with the community (e.g., emergency hotlines or messages), or through on-site verification by the person responsible for this task.

Furthermore, CEBS teams at all levels should maintain a record of every signal and document the status and key details, including dates, for each of the following steps: signal reported, triaged, verified, and responded to, in order to facilitate the monitoring and evaluation process. Once a signal has been verified, it is classified as an event. The next step is to conduct a risk assessment to determine its impact and the appropriate response.

Risk assessment

Risk assessment is a systematic process for gathering, evaluating, and documenting information to assign a risk level. It is comprised of three components: a hazard assessment, exposure assessment, and context assessment *(18)*. After a signal is verified, the assigned institutions should begin a risk assessment for the event. These institutions should adhere to the existing national guidelines for risk assessments.

Depending on the type of the event, coordination for multisectoral risk assessments should be activated or convened. This ensures a comprehensive assessment, and a risk level informed by relevant sectors, as well as the coordination of timely communication with all assigned institutions and other stakeholders.

Assigned institutions may consider communicating the risk assessment results, including their implications, with communities and community structures in a timely manner, in accordance with national risk communication guides.

Response

Once the risk assessment has been conducted for an event and, depending on the outcome of the assessment, a rapid response may be required. The rapid response involves implementing immediate intervention or prevention measures and coordinating them with the relevant stakeholders. Such measures may include, but are not limited to, vaccination, integrated vector management, antibiotic prophylaxis, the promotion of non-pharmacological measures, and risk communication. It may also be necessary to mobilize other sectors to ensure a comprehensive and effective response through the interventions under their purview.

The response to events triggered by CEBS must adhere to the response plans, procedures, and protocols established by the assigned institutions. Additionally, the participation of community

agents and community structures may also be incorporated into the response efforts; for example, individual or collective measures can be implemented while the institutional response is underway.

Coordinating CEBS efforts with prevention and control programs, as well as with stakeholders, is crucial to ensuring the integration of information and a coordinated response, without duplicating activities or fragmenting the community.

Every signal reported by community agents or directly from the community must be addressed, referred to the appropriate sector, and responded to in a manner that is commensurate with the assessed level of risk.



7. MONITORING AND EVALUATION

In the context of surveillance and response systems, monitoring refers to the routine and continuous tracking of the implementation of planned surveillance activities and the overall performance of these systems. Evaluation is defined as the periodic assessment of the relevance, effectiveness, and impact of activities in light of the objectives of the surveillance and response systems *(19)*.

When establishing or strengthening CEBS, it is necessary to develop a monitoring and evaluation process as a cross-cutting element. This allows for the identification of short- and long-term goals and related indicators for periodic monitoring and evaluation. These indicators will help determine the need to modify, improve, or adapt the surveillance system.

Countries should prepare their monitoring and evaluation processes for CEBS in alignment with their national planning guidelines and strategies. Stakeholder involvement, ranging from institutional bodies to the community and community structures, is encouraged during the monitoring and evaluation phase.

Based on the tasks and activities involved in the strategic planning, operational planning, and implementation phases of CEBS, monitoring indicators can be established to track the progress of the management, processes, outcomes, and impact of CEBS across these phases.

Evaluation should begin with a baseline that identifies the extent to which CEBS has been implemented at the national or subnational level. Using this baseline information, each country must then define the specific evaluation targets to measure progress. This process should be repeated periodically, in accordance with each country's guidelines, to assess progress, identify gaps, guide adjustments, and determine the degree to which targets have been met.

National or subnational authorities should consider incorporating contributions from CEBS into the evaluation of the overall surveillance system's attributes, or alternatively, consider conducting a specific evaluation of these attributes tailored to CEBS.

The evaluation should consider the achievements of both the community and the surveillance system. In this respect, it is important to take into account the aspects that the community values; for example, from the community's perspective, every reported signal is expected to trigger a concrete response, particularly those perceived as priorities due to the need for human or animal health services. Traditionally, the community values qualitative aspects of its relationship with institutions, such as trust, respect, intercultural dialogue, and collaboration.

Annex 3 provides examples of suggestions for developing indicators regarding the management, processes, outcomes, and impact of CEBS, structured according to the phases of establishing or strengthening CEBS.



8. INFORMATION DISSEMINATION AND FEEDBACK

National and subnational authorities may consider including information dissemination and feedback in the establishment and strengthening phases for CEBS. Disseminating information regarding CEBS contributes to the strategic planning as it facilitates the engagement of all stakeholders, while providing feedback helps sustain that engagement throughout every phase.

Results from CEBS, particularly its contributions for signal detection, can be disseminated to stakeholders, the community, community structures, and other audiences through bulletins, reports, public dashboards, and technical documents. It is also important to establish communication channels tailored to different audiences; for instance; information sessions, workshops, seminars, forums, or field visits can be organized to explain the objectives, operations, and benefits of CEBS.

Ensuring two-way communication is crucial as it allows stakeholders to raise questions, offer suggestions, and express concerns. Outreach to the community can include community dialogues, educational materials adapted to different sociodemographic profiles, and local media such as community radio and social networks.

It is recommended that CEBS teams, or the assigned institutions, provide periodic feedback to community agents and community structures regarding the triaged signals, verified events, and the status of those signals in the areas where they were reported. This helps to build trust in CEBS, improve the perception of its benefits, and encourage active community participation.

Information generated by community agents, derived from consolidating the community reports, can support their tasks; for instance, it can serve as a resource during home visits, outreach campaigns, or community meetings. With community support, community agents can produce newsletters detailing the presence of specific diseases or summarizing results obtained through CEBS.

In other community engagement initiatives, community agents can present their community's epidemiological situation to facilitate coordination with institutions or catalyze social mobilization efforts. This may result in strengthening primary care, immunization campaigns, or screening activities; improving access to medicines; promoting protective measures; implementing preventive isolation measures; or making environmental improvements, amongst other interventions.

REFERENCES

1. Morgan OW, Abdelmalik P, Pérez-Gutiérrez E, Socé Fall I, Kato M, Hamblion E, *et al*. How better pandemic and epidemic intelligence will prepare the world for future threats. Nat Med. 2022; 28: 1526-1528. Available from: https://doi.org/10.1038/s41591-022-01900-5.

2. Pan American Health Organization. PAHO Health Emergency Appeal 2023. Washington, D.C.: PAHO; 2023. Available from: https://www.paho.org/en/paho-health-emergency-appeal-2023.

3. World Health Organization. Declaration of Alma-Ata. Geneva: WHO; 1978. Available from: https://www.who.int/publications/i/item/WHO-EURO-1978-3938-43697-61471.

4. La Libertad Regional Health Directorate. Sistema de vigilancia comunal: modelo de atención integral de salud. Lima: Ministry of Health; 2005. Available from: https://www.gob.pe/institucion/minsa/informes-publicaciones/352820-sistema-de-vigilancia-comunal-modelo-de-atencion-integral-de-salud.

5. National Institute of Health. Public health surveillance guidelines and documents: INS; [date unknown]. Available from: https://www.ins.gov.co/Direcciones/Vigilancia/Paginas/Lineamientos-y-documentos.aspx.

6. World Health Organization, Regional Office for Africa. Integrated disease surveillance and response in the African Region: A guide for establishing community-based surveillance. Brazzaville: WHO; 2014. Available from: https://www.afro.who.int/sites/default/files/2017-06/a-guide-for-establishing-community-based-surveillance-102014_0.pdf.

7. Ndiaye SM, Quick L, Sanda O, Niandou S. The value of community participation in disease surveillance: A case study from Niger. Health Promot Int. 2003;18(2):89–98. Available from: https://doi.org/10.1093/heapro/18.2.89.

8. Moldoisaeva S, Kaliev M, Sydykova A, Muratalieva E, Ismailov M, Madureira Lima J, et al. Kyrgyzstan: Health system review. Health Systems in Transition. 2022;24(3). Available from: https://iris.who.int/bitstream/handle/10665/363175/9789289059237-eng.pdf.

9. Pan American Health Organization. Strategy on Epidemic Intelligence for Strengthening Early Warning of Health Emergencies 2024–2029 [CD61/12, Rev. 1]. 61st Directing Council of PAHO, 76th Session of the Regional Committee of WHO for the Americas. Washington, D.C., 30 September–4 October 2024. Washington, D.C.: PAHO; 2024. Available from: https://www.paho.org/en/documents/cd6112-rev-1-strategy-epidemic-intelligence-strengthening-early-warning-health.

10. 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, 26–28 June 2018. Eurosurveillance. 2019;24(2) :1800681. Available from: https://www.eurosurveillance.org/content/10.2807/1560-7917.ES.2019.24.2.1800681.

11. UNESCO Institute for Statistics. Community [glossary entry]. Montreal: UNESCO Institute for Statistics; [date unknown]. Available from: https://databrowser.uis.unesco.org/resources/glossary.

12. World Health Organization. Early detection, assessment and response to acute public health events: Implementation of early warning and response with a focus on event-based surveillance (Interim version). Geneva: WHO; 2014. Available from: https://apps.who.int/iris/handle/10665/112667.

13. Pan American Health Organization. Manual del agente comunitario de salud: atención integrada a las enfermedades prevalentes de la infancia (AIEPI). Washington, D.C.: PAHO; 2010. Available from: https://iris.paho.org/handle/10665.2/49086.

14. Pan American Health Organization. Essential public health functions. Washington, D.C.: PAHO [date unknown]. Available from: https://www.paho.org/en/topics/essential-public-health-functions.

15. World Health Organization. Implementation guide for the medical eligibility criteria and selected practice recommendations for contraceptive use guidelines. Geneva: WHO; 2018. Available from: https://www.who.int/publications/i/item/9789241513579.

16. World Health Organization. Health systems governance. Geneva: WHO; [date unknown]. Available from: https://www.who.int/health-topics/health-systems-governance.

17. Pan American Health Organization, World Health Organization. The knowledge dialogues methodology. Washington, D.C.: PAHO/WHO; [date unknown]. Available from: https://www.paho.org/en/documents/knowledge-dialogues-methodology.

18. World Health Organization. Rapid risk assessment of acute public health events. Geneva: WHO; 2012. Available from: https://www.who.int/publications-detail-redirect/rapid-risk-assessment-of-acute-public-health-events.

19. World Health Organization. Early warning alert and response (EWAR) in emergencies: An operational guide. Geneva: WHO; 2022. Available from: https://www.who.int/publications/i/item/9789240063587.

BIBLIOGRAPHY

AcadeAcademy for Educational Development, Manoff Group. Handbook for community surveillance coordinators to support community participation in detection and prevention of polio and other diseases. Version 2. Washington, D.C.: Academy for Educational Development, CHANGE Project; 2001. Available from: https://decfinder.devme.ai/dec/handbook-for-community-surveillance-coordinators-to-support-community-participation-in-detection-and-prevention-of-polio-and-other-diseases.

Byrne A. Halting epidemics at the outset: community-based surveillance (CBS) in an epidemic preparedness model for early detection and early action. Int J Infect Dis. 2022;116(S98). Available from: https://doi.org/10.1016/j.ijid.2021.12.231.

International Federation of Red Cross and Red Crescent Societies. Community-based surveillance: Guiding principles. Geneva: IFRC; 2017. Available from: https://cbs.ifrc.org/resources/community-based-surveillance-guiding-principles.

Hamblion E, Saad NJ, Greene-Cramer B, Awofisayo-Okuyelu A, Minet DS, Smirnova A, *et al*. Global public health intelligence: World Health Organization operational practices. PLOS Glob Public Health. 2023;3(9):e0002359. Available from: https://doi.org/10.1371/journal.pgph.0002359.

Kickbusch I, Allen L, Franz C. The commercial determinants of health. Lancet Glob Health. 2016;4(12):e895-e896. Available from: https://doi.org/10.1016/S2214-109X(16)30217-0.

Maazou AA, Oumarou B, Bienvenu B, Anya BPM, Didier T, Ishagh EK, *et al*. Community-based surveillance contribution to the response of COVID-19 in Niger. Pan Afr Med J. 2021;40:88. Available from: https://pubmed.ncbi.nlm.nih.gov/34909077.

Morgan OW, Abdelmalik P, Perez-Gutierrez E, Fall IS, Kato M, Hamblion E, *et al*. How better pandemic and epidemic intelligence will prepare the world for future threats. Nat Med. 2022;28(8):1526-1528. Available from: https://doi.org/10.1038/s41591-022-01900-5.

World Health Organization Regional Office for Africa. Technical guidelines for integrated disease surveillance and response in the African region. Harare: WHO; 2001. Available from: https://stacks.cdc.gov/view/cdc/12082.

World Health Organization Regional Office for Africa. Technical guidelines for integrated disease surveillance and response in the African region: Third edition. Brazzaville: WHO; 2019. Available from: https://www.afro.who.int/publications/technical-guidelines-integrated-disease-surveillance-and-response-african-region-third.

World Health Organization, Regional Office for Africa. Integrated diseases surveillance and response in the African region. Community-based surveillance (CBS) training manual. Brazzaville: WHO; 2015. Available from: https://www.afro.who.int/sites/default/files/2017-06/community-based-surveillance_idsr_training-manual.pdf.

World Health Organization. A strategic framework for emergency preparedness. Geneva: WHO; 2017. Available from: https://www.who.int/publications/i/item/a-strategic-framework-for-emergency-preparedness.

World Health Organization. Defining collaborative surveillance: A core concept for strengthening the global architecture for health emergency preparedness, response, and resilience (HEPR). Geneva: WHO; 2023. Available from: https://www.who.int/es/publications/i/item/9789240074064.

World Health Organization. Strengthening health emergency prevention, preparedness, response, and resilience. Geneva: WHO; 2023. Available from: https://cdn.who.int/media/docs/default-source/emergency-preparedness/who_hepr_wha2023-21051248b.pdf.

Pan American Health Organization. Curso de agentes comunitarios de la salud: manual del agente comunitario de salud "Por nuestra salud". Washington, D.C.: PAHO; 2010. Available from : https://iris.paho.org/handle/10665.2/49086.

Organización Panamericana de la Salud. Detección temprana, evaluación y respuesta ante eventos agudos de salud pública: puesta en marcha de un mecanismo de alerta temprana y respuesta con énfasis en la vigilancia basada en eventos. Versión provisional. Washington, D.C.: OPS; 2015. Disponible en: https://iris.paho.org/handle/10665.2/10115.

Pan American Health Organization. Early detection, assessment and response to acute public health events: Implementation of early warning and response with a focus on event-based surveillance. Interim Version. Washington, D.C.: PAHO; 2015. Available from: https://iris.paho.org/handle/10665.2/10115.

Pan American Health Organization. Logical approach for project management in the Pan American Health Organization (PAHO). Washington, D.C.: PAHO; 2003. Available from: https://iris.paho.org/handle/10665.2/37513.

Pan American Health Organization. The essential public health functions in the Americas: A renewal for the 21st century. Conceptual framework and description. Washington, D.C.: PAHO; 2020. Available from: https://iris.paho.org/handle/10665.2/53124.

Pan American Health Organization. Módulos de principios de epidemiología para el control de enfermedades (MOPECE), segunda edición. Washington, D.C.: PAHO; 2002. Available from: https://iris.paho.org/server/api/core/bitstreams/29f6e4f7-cb7a-48ce-82bf-85d3e708144a/content.

Ratnayake R, Tammaro M, Tiffany A, Kongelf A, Polonsky JA, McClelland A. People-centred surveillance: A narrative review of community-based surveillance among crisis-affected populations. Lancet Planet Health. 2020;4(10):e483–e495. Available from: https://doi.org/10.1016/S2542-5196(20)30221-7.

Rose DA, Murthy S, Brooks J, Bryant J. The evolution of public health emergency management as a field of practice. Am J Public Health. 2017;107(S2):S126–S133. Available from: https://doi.org/10.2105/ajph.2017.303947.

Wójcik OP, Brownstein JS, Chunara R, Johansson MA. Public health for the people: Participatory infectious disease surveillance in the digital age. Emerg Themes Epidemiol. 2014;11(1):7. Available from: https://doi.org/10.1186/1742-7622-11-7.

GLOSSARY

Alert: A signal that has been verified as an event and assessed, and which requires an intervention (such as an investigation, a response, or a communication with partners or the public).[1]

Case: A person identified as having a particular disease, health problem, or condition under surveillance or investigation.[2]

Community: A group of people who share common characteristics or interests. A community may be a group of people defined by geographical location, or a group with shared interests or a common demographic profile, regardless of their physical location within a country.[3]

Community agent: A volunteer chosen or recognized by their community who promotes healthy practices among families and community development, working in coordination with health personnel and other social stakeholders.[4]

Community event-based surveillance: Surveillance based on the detection and reporting of events of public health importance within a community by members of that community.[5]

Community structure: A formal or informal group of people who perform certain functions, including participating in the management and decision-making regarding community life. It may have leaders who are democratically elected, self-appointed, or chosen informally, including traditional leaders.[6]

Contact: Identification of individuals who may have been exposed to infected persons or infectious materials.[7]

Detection: The process by which signals of potential public health risks are identified, recorded, and undergo preliminary assessment.[8]

Early warning and response: An organized process for rapidly detecting and responding to signals during public health events of any origin. Establishing an EWAR mechanism provides early warning of acute public health events and then links this function to an immediate response.[9]

---

[1] World Health Organization. Early warning alert and response (EWAR) in emergencies: An operational guide. Geneva: WHO; 2022. Available from: https://www.who.int/publications/i/item/9789240063587.
[2] UNESCO Institute for Statistics. Community [glossary entry]. Montreal: UNESCO Institute for Statistics; [date unknown]. Available from: https://databrowser.uis.unesco.org/resources/glossary.
[3] UNESCO Institute for Statistics. Community [glossary entry]. Montreal: UNESCO Institute for Statistics; [date unknown]. Available from: https://databrowser.uis.unesco.org/resources/glossary.
[4] Pan American Health Organization. Manual del agente comunitario de salud: Atención integrada a las enfermedades prevalentes de la infancia (AIEPI). Washington, D.C.: PAHO; 2010. Available from: https://iris.paho.org/handle/10665.2/49086.
[5] 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. Euro Surveill. 2019;24(2). Available from: https://www.eurosurveillance.org/content/10.2807/1560-7917.ES.2019.24.2.1800681.
[6] United Nations High Commissioner for Refugees. Transforming community structures into community protection structures: An emerging practice in community-based protection in North Kivu, South Kivu and Ituri in the Democratic Republic of the Congo. Geneva: UNHCR; 2021. Available from: https://www.unhcr.org/sites/default/files/legacy-pdf/60e5ad6c0.pdf.
[7] World Health Organization. Glossary of health emergency and disaster risk management terminology. Geneva: WHO; 2020. Available from: https://www.who.int/publications/i/item/9789240003699.
[8] World Health Organization. Global public health intelligence report 2022. Geneva: WHO; 2022. Available from: https://www.who.int/publications/i/item/9789240073579.
[9] World Health Organization. Early detection, assessment and response to acute public health events: Implementation of early warning and response with a focus on event-based surveillance. Interim version. Geneva: WHO; 2014. Available from: https://apps.who.int/iris/handle/10665/112667.

Emergency: A type of event or imminent threat that causes, or has the potential to cause, a range of consequences, and which requires coordinated action, which is generally urgent and often non-routine in nature.[10]

Epidemic: The occurrence of cases of a disease, a specific health-related behavior, or other health-related events in a community or region clearly exceeding what would be expected under normal conditions.[11]

Event: The manifestation of a disease or occurrence of a potential pathogen.[12]

Event-based surveillance: The organized collection, monitoring, assessment, and interpretation of ad hoc, primarily unstructured, information regarding events or hazards that may pose a serious threat to human health.[13]

Exposure: The situation of people, infrastructure, housing, production capacities, and other tangible assets located in hazard-prone areas.[14]

Indicator-based surveillance: A routine system for collecting, analyzing, and interpreting data on notifiable diseases. Data are structured according to case definitions.[15]

Knowledge dialogues: Also known as intercultural dialogues, they are processes of communication and exchange between individuals, groups, or communities from different backgrounds or cultures. In the health sector, these exchanges take place between specific groups or individuals and trained health personnel.[16]

Outbreak: Often used as a synonym for "epidemic", this term is typically used to indicate localized rather than widespread epidemics.[17]

Public health surveillance: The systematic and continuous collection, comparison, and analysis of data for public health purposes, and the timely dissemination of such data for assessment and appropriate public health response.[18, 19]

---

[10] World Health Organization. Glossary of health emergency and disaster risk management terminology. Geneva: WHO; 2020. Available from: https://www.who.int/publications/i/item/9789240003699.
[11] World Health Organization. Glossary of health emergency and disaster risk management terminology. Geneva: WHO; 2020. Available from: https://www.who.int/publications/i/item/9789240003699.
[12] World Health Organization. International Health Regulations (2005). Third edition. Geneva: WHO; 2016. Available from: https://www.who.int/publications/i/item/9789241580496.
[13] World Health Organization. Glossary of health emergency and disaster risk management terminology. Geneva: WHO; 2020. Available from: https://www.who.int/publications/i/item/9789240003699.
[14] World Health Organization. Glossary of health emergency and disaster risk management terminology. Geneva: WHO; 2020. Available from: https://www.who.int/publications/i/item/9789240003699.
[15] World Health Organization. Strengthening surveillance of and response to foodborne diseases: A practical manual. Stage 2: strengthening indicator-based surveillance. Geneva: WHO; 2017. Available from: https://www.who.int/publications/i/item/9789241513258.
[16] Pan American Health Organization. The knowledge dialogues methodology. Washington, D.C.: PAHO; 2022. Available from: https://www.paho.org/en/documents/knowledge-dialogues-methodology.
[17] World Health Organization. Glossary of health emergency and disaster risk management terminology. Geneva: WHO; 2020. Available from: https://www.who.int/publications/i/item/9789240003699.
[18] World Health Organization. Glossary of health emergency and disaster risk management terminology. Geneva: WHO; 2020. Available from: https://www.who.int/publications/i/item/9789240003699.
[19] World Health Organization. International Health Regulations (2005). Third edition. Geneva: WHO; 2016. Available from: https://www.who.int/publications/i/item/9789241580496.

Reporting: The process by which cases or outbreaks are communicated to health authorities.[20]

Response: The provision of emergency services and public assistance during or immediately after a disaster in order to save lives, reduce adverse health effects, ensure public safety, and meet the basic subsistence needs of the affected people.[21]

Risk: The probability that a specific event will occur within a given timeframe if a person is exposed to a threat or hazard. Risk is a quantifiable concept that often reflects the likelihood of an adverse event, such as death or illness.[22, 23]

Risk assessment: An ongoing process of gathering, evaluating, and documenting information to estimate the nature and likelihood of adverse effects on humans exposed to an event or hazard. A risk assessment provides the basis for actions aimed at reducing the negative consequences of public health events through preparedness and response activities.[24]

Rumor: Unverified information regarding the occurrence of diseases, received from informal sources.[25]

Sensitivity: The ability of a system to detect epidemics and other changes in the occurrence of health problems; the proportion of people with a health problem who are correctly identified by a screening test or case definition.[26]

Signal: The initial detection of a potential public health event, prior to verification. Signals may consist of information or reports regarding cases or deaths (individual or clustered); potential human exposure to biological, chemical, or radionuclear agents; or the occurrence of natural or human-made disasters. A verified signal becomes an event.[27]

Stakeholder: A person or organization that can affect, be affected by, or perceive itself to be affected by a decision or activity.[28]

Threat: A situation and/or development – or a combination of both – that may affect health security, whether as an actual or perceived danger.[29] For purposes of this report, this is referred to as a "public health threat".

---

[20] World Health Organization. Joint External Evaluation Tool: International Health Regulations (2005). Second edition. Geneva: WHO; 2018. Available from: https://extranet.who.int/sph/sites/default/files/document-library/document/9789241550222-eng.pdf.

[21] World Health Organization. Glossary of health emergency and disaster risk management terminology. Geneva: WHO; 2020. Available from: https://www.who.int/publications/i/item/9789240003699.

[22] World Health Organization. Rapid risk assessment of acute public health events. Geneva: WHO; 2012. Available from: https://www.who.int/publications-detail-redirect/rapid-risk-assessment-of-acute-public-health-events.

[23] Cole SR, Hudgens MG, Brookhart MA, Westreich D. Risk. Multivariable Mendelian randomization: The use of pleiotropic genetic variants to estimate causal effects. Am J Epidemiol. 2015;181(4):246–250. Available from: https://doi.org/10.1093/aje/kwu283.

[24] World Health Organization. Rapid risk assessment of acute public health events. Geneva: WHO; 2012. Available from: https://www.who.int/publications-detail-redirect/rapid-risk-assessment-of-acute-public-health-events.

[25] World Health Organization. Outbreak surveillance and response in humanitarian emergencies: WHO guidelines for EWARN implementation. Geneva: WHO; 2012. Available from: https://iris.who.int/handle/10665/70812.

[26] World Health Organization. Outbreak surveillance and response in humanitarian emergencies: WHO guidelines for EWARN implementation. Geneva: WHO; 2012. Available from: https://iris.who.int/handle/10665/70812.

[27] World Health Organization. Glossary of health emergency and disaster risk management terminology. Geneva: WHO; 2020. Available from: https://www.who.int/publications/i/item/9789240003699.

[28] International Organization for Standardization. Risk management: Guidelines (ISO 31000:2018). Geneva: ISO; 2018. Available from: https://www.iso.org/obp/ui#iso:std:iso:31000:ed-2:v1:en.

[29] International Organization for Standardization. Security and resilience (ISO 22301:2019). Geneva: ISO; 2021. Available from: https://www.iso.org/en/contents/data/standard/07/70/77008.html.

Triage: The process of selecting data and information that is relevant for early detection (i.e., distinguishing minor or irrelevant events from potential acute public health events, removing duplicate data, and correcting obvious errors).[30]

Triangulation (of data): The review, synthesis, and integration of data from multiple sources through collection, analysis, comparison, and interpretation.[31]

Verification: The confirmation of the authenticity, integrity, and accuracy of data, in order to eliminate hoaxes, false rumors, and artifacts. Verification involves double-checking the primary source, integrating and comparing data with other sources, comparing against specific parameters and indicators, and conducting field investigations (see also triangulation).[32]

Vulnerability: The characteristics and circumstances (physical, social, economic, and environmental factors or processes) of an individual, community, system, or asset that make it susceptible to the effects of a hazard.[33]

[30] International Organization for Standardization. Security and resilience (ISO 22301:2019). Geneva: ISO; 2021. Available from: https://www.iso.org/en/contents/data/standard/07/70/77008.html.
[31] Rutherford GW, McFarland W, Spindler H, White K, Patel SV, Aberle-Grasse J, et al. Public health triangulation: Approach and application to synthesizing data to understand national and local HIV epidemics. BMC Public Health. 2010;10:447. Available from: https://doi.org/10.1186/1471-2458-10-447.
[32] World Health Organization. Early warning alert and response in emergencies: An operational guide. Geneva: WHO; 2022. Available from: https://www.who.int/publications/i/item/9789240063587.
[33] World Health Organization. Defining collaborative surveillance: A core concept for strengthening the global architecture for health emergency preparedness, response, and resilience (HEPR). Geneva: WHO; 2023. Available from: https://www.who.int/publications/b/69325



ANNEXES

Annex 1. Proposed responsibilities for implementing community event-based surveillance

Table A1.1. Proposed responsibilities (by administrative level) for implementing community event-based surveillance, in accordance with the phases and roles described in the text

CEBS phase	Role	Responsibilities	National	First subnational level	Second subnational level	Community level
Risk characterization and gap analysis		Creating and updating the risk characterization	XXX	XX	X	
		Incorporating risk assessments into the risk characterization	XXX	XX		
		Identifying gaps and needs	XXX	XXX	XXX	XXX
Prioritization of public health threats and events for surveillance		Identifying priority events	XXX	XXX	XXX	XXX
		Incorporating priority events into strategic planning	XXX	XX	X	XXX
		Developing strategies for areas that are highly vulnerable due to limited capacity or early-stage community participation	XXX	XXX	XX	XXX
Strategic planning	**Defining objectives**		XXX	X	X	X
	Stakeholder mapping	Mapping stakeholders and their relationship to CEBS	XXX	XX	XX	X
		Mapping community structures and organizations	XXX	XX	XX	XXX

CEBS phase	Role	Responsibilities	National	First subnational level	Second subnational level	Community level
Strategic planning *(cont.)*	**Advocacy and stakeholder mobilization**	Advocating for the incorporation of CEBS into the national public health surveillance system	XXX			
		Advocating for recognition or inclusion in other plans	XXX	XXX	X	
		Advocating for an established link to healthcare	XXX	XXX	X	
		Advocating for formalized multisectoral or multi-stakeholder collaboration and coordination	XXX	XXX	X	
		Advocating for coordination with community structures and processes	XXX	XXX	X	XXX
		Advocating for coordination with existing CEBS processes at the subnational or regional level	XX	XXX	XXX	XX
		Advocating for inclusion through promotion and well-being initiatives	XX	XX	X	
		Advocating for alignment with information system policies	XXX	XX	X	

CEBS phase	Role	Responsibilities	National	First subnational level	Second subnational level	Community level
Strategic planning *(cont.)*	**Governance**	Implementing the governance body	XXX	XX		XX
		Managing the CEBS approach within the health sector in line with its institutional structure	XXX	XX	XX	
		Convening sectors responsible for the health and well-being of individuals in various vulnerable situations	XXX	XX	XX	
		Establishing multisectoral collaboration agreements	XXX	X	X	
		Promoting intercultural dialogues	XXX	XXX	XXX	XXX
	Adapting the institutional and legal framework	Adapting the legal framework for establishing or strengthening CEBS	XXX	XXX	X	
		Adapting the administrative framework for establishing or strengthening CEBS	XXX	XXX	XX	
		Integrating CEBS into the public health surveillance system	XXX	XX		

CEBS phase	Role	Responsibilities	National	First subnational level	Second subnational level	Community level
Strategic planning *(cont.)*	**Adapting the institutional and legal framework** *(cont.)*	Incorporating CEBS activities into legal frameworks to promote community participation	XXX	XX		
		Increasing the visibility of CEBS in national or sectoral plans	XXX	XXX	XXX	
		Incorporating human resources for CEBS into human resources for health policies	XXX	XX		
		Activating integrated pathways in response to signals detected by CEBS				
		Promoting the alignment of institutional and legal frameworks in other sectors	XXX	XX		
		Developing or updating the guide or guidelines for CEBS	XXX	XX		
	Resource allocation	Reviewing and assessing the resources made available for CEBS by stakeholders	XXX	XX	X	
		Gradually allocating resources for operational planning and implementation	XXX	XX	X	

CEBS phase	Role	Responsibilities	National	First subnational level	Second subnational level	Community level
Strategic planning *(cont.)*	**Resource allocation** *(cont.)*	Promoting decentralized resource allocation	XXX	XX	XX	
		Allocating resources by autonomous subnational levels			XXX	
		Managing resource allocation for programs promoting community participation or the well-being of vulnerable populations	XX	XX	X	XX
		Managing resource allocation among the various stakeholders, including other sectors				
		Identifying and managing external resources	XXX	XX	XX	
		Allocating resources for the development of public health information management tools	XXX	XX	X	
Operational planning	**Defining roles and responsibilities**	Establishing the expected roles and responsibilities of stakeholders and institutional authorities	XXX	XX		
		Adapting roles and responsibilities among stakeholders	XXX	XX		

CEBS phase	Role	Responsibilities	National	First subnational level	Second subnational level	Community level
Operational planning *(cont.)*	**Coordination mechanisms**	Establishing the coordination mechanisms	XXX	XX	XX	
		Establishing a multisectoral or stakeholder liaison process	XXX	XX	XXX	
		Identifying and implementing mechanisms for links to healthcare services	XXX	XX	XX	
		Using digital platforms to facilitate coordination	XXX	XX		
		Establishing the national network of community agents for CEBS	XXX	XXX	XXX	XXX
	Assembling teams	Forming institutional CEBS teams	XXX	XXX	XXX	X
		Establishing mechanisms for team interaction with stakeholders and other sectors	X	XXX	XXX	
		Training members of institutional teams	XXX	XX	X	
	Developing the training plan	Developing a comprehensive training plan	XXX	XX	XX	
		Implementing trainings for trainers	XXX	XX	X	
		Culturally and linguistically adapting training processes	XX	XX	XX	X

CEBS phase	Role	Responsibilities	National	First subnational level	Second subnational level	Community level
Operational planning *(cont.)*	**Community engagement**	Understanding the context of communities	XX	XXX	XXX	XX
		Compiling community participation experiences with an emphasis on CEBS	XXX	XXX	X	XXX
		Establishing approaches based on intercultural dialogue	XXX	XXX	XXX	XX
		Informing the community about the implementation of CEBS	XXX	XXX	XXX	XX
		Providing feedback to the community on how CEBS is working	XXX	XXX	XXX	XX
	Technical and operational support	Providing technical and operational support for institutional CEBS teams	XX	XXX		
		Providing technical support for the CEBS network	XX	XXX	XXX	XX
Implementation	**Selecting the surveillance model**	Establishing a central CEBS model	XXX	XX		
		Adapting the CEBS model to communities	X	XXX	XXX	XX
		Adapting the CEBS model to specific contexts	XX	XXX	XXX	XX
		Implementing innovative surveillance strategies using sensors	XX	XXX	XXX	

CEBS phase	Role	Responsibilities	National	First subnational level	Second subnational level	Community level
Implementation *(cont.)*	**Selecting the surveillance model** *(cont.)*	Considering diagnostic processes to link them to elimination planning processes	XXX	XX	X	
		Consolidating the CEBS network	XXX	XXX	XXX	XXX
	Preparation of key documents	Adapting surveillance protocols	XXX	XX		
		Developing the community agent guide	XXX	XX	XX	
		Establishing multisectoral protocols	XXX	XX		
		Adapting the early warning system or epidemic intelligence process	XXX	XX		
		Aligning procedures or protocols of other involved institutions	XXX	XX		
	Integrating and empowering community agents	Selecting community agents		XXX	XXX	XXX
		Registering and integrating community agents in the CEBS network	XX	XXX	XXX	XXX
		Defining and allocating incentives	XXX	XX	X	
		Assigning agents geographically or by community		XX	XXX	XX
		Training and simulation	XX	XXX	XX	

CEBS phase	Role	Responsibilities	National	First subnational level	Second subnational level	Community level
Implementation *(cont.)*	**Signal reporting**	Establishing the data capture mechanism	XXX	XXX	X	
		Adapting reporting to the signal type	XXX	XX	XX	
		Following up the zero-signal report	XX	XX		
		Establishing institutional information protection processes	XXX	XXX	XXX	
		Monitoring adherence to ethical considerations by community agents		XXX	XXX	XXX
		Monitoring adherence to ethical considerations by institutional authorities and stakeholders	XX	XXX	XXX	
	Signal triage	Establishing triage criteria	XXX	XX		
		Adapting triage criteria for community agents	XXX	XX		
		Incorporating the criteria into early warning system protocols	XXX	XX		
		Referral to services	X	XXX	XXX	
		Establishing signals excluded from monitoring	XXX	XX		
		Monitoring of selected discarded signals		XX	XX	XXX

CEBS phase	Role	Responsibilities	National	First subnational level	Second subnational level	Community level
Implementation *(cont.)*	**Signal verification**	Establishing the institution responsible for verification	XXX	XX		
		Aligning national signal verification processes	XXX	XX		
		Verifying signals	XX	XXX	X	
		Referral of signals for verification by other sectors	XX	XXX	XX	
	Risk assessment	Assigning the levels at which assessment will be conducted	XXX	XX		
		Conducting the risk assessment	XXX	X		
		Calling for multisectoral evaluation mechanisms	XXX	X		
	Response	Deploying response in line with sectoral response protocols	X	XX	XXX	
		Mobilizing community agents and structures for the response	X	X	XXX	XXX
		Referral for a multisectoral response	XX	XXX	XXX	X
Monitoring and evaluation	**Monitoring and evaluation framework**	Designing a monitoring and evaluation framework	XXX	XX		
		Calling for stakeholders to participate in monitoring and evaluation	XXX	XXX	XXX	
		Involving the community and its structures in monitoring and evaluation	XXX	XX		XXX

CEBS phase	Role	Responsibilities	National	First subnational level	Second subnational level	Community level
Monitoring and evaluation *(cont.)*	**Monitoring**	Establishing and measuring the monitoring of strategic plan indicators	XXX	XX		
		Establishing and measuring the monitoring of operational plan indicators	XXX	XX		
		Establishing and measuring the monitoring of implementation-phase indicators	XXX	XX		
	Evaluation	Establishing goals	XXX	XX		
		Preparing an evaluation baseline	XXX	XX		
		Incorporating community-based evaluation elements	XX	XX		XXX
		Developing the CEBS attribute evaluation	XXX	XX	XX	XX
Information dissemination and feedback	**Information dissemination**	Disseminating the CEBS results	XXX	XXX	XX	XX
		Establishing and using communication channels by audience	XXX	XX	X	
		Using information generated by CEBS by community agents	X	X	X	XXX
	Feedback	Promoting community-led health situation analysis	X	XX	XX	XXX
		Providing feedback to the community on how CEBS is working	XXX	XXX	XXX	X

Source: The authors. *Note:* The number of "X"s indicates the level of responsibility assigned; therefore, the greater the number of "X"s, the greater the responsibility at that level.

Annex 2. Examples of signals to be reported through community event-based surveillance

Table A2.1. Example of signals to be reported, description in language appropriate for the community, and possible associated syndromes and events

Community or community agents		Health workers or surveillance teams		
Signal for reporting	**Signs or symptoms detected**	**Syndrome or condition**	**Technical description**	**Possible associated events**
Signals of symptom clusters consistent with infectious events that have a high potential to cause an outbreak or epidemic				
Fever and severe influenza	High fever Difficulty breathing (shortness of breath) Sudden onset of sounds (wheezing) in the chest Sunken chest or indentation between the ribs (children)	**Acute respiratory syndrome**	Acute onset of fever Cough Respiratory distress No predisposing factors or underlying diseases	**Seasonal viruses:** Influenza SARS-CoV-2 Respiratory syncytial virus Metapneumovirus Bocavirus **Variants of zoonotic origin** Influenza A **Emerging events** Whooping cough Hantavirus Pneumonic plague Inhalation anthrax
Key: Cases in a nearby geographical area. Relationship between cases. Need for emergency care or hospitalization.				
Sudden and severe diarrhea	Diarrhea Vomiting or nausea Sunken eyes Blood in the stool	**Acute diarrheal syndrome**	Sudden onset Diarrhea Bloody stools No predisposing factors or underlying disease Dehydration	**Viral** **Bacterial** Cholera **Foodborne illnesses** **Poisoning**
Key: Cases in a nearby geographical area. Relationship between cases. Need for emergency care or hospitalization. Two or more cases. Possible common source.				
Fever with a rash or skin eruption	Fever Rash or skin eruption Sudden onset	**Febrile syndrome with rash**	Fever Rash	**Virus** Measles Rubella Roseola infantum Hand, foot, and mouth disease Mpox **Bacteria** Scarlet fever Lyme disease Typhoid fever
Key: Cases in a nearby geographical area. Relationship between cases. Vaccination history. Migration phenomena. Population refusing vaccination.				
Any signal perceived by the community as a potential risk to public health must be reported immediately				

Community or community agents		Health workers or surveillance teams		
Signal for reporting	**Signs or symptoms detected**	**Syndrome or condition**	**Technical description**	**Possible associated events**
Signals of symptom clusters consistent with infectious events that have a high potential to cause an outbreak or epidemic *(cont.)*				
Fever and bleeding	Fever Purple spots on the skin Blood in the stool, cough, or bleeding from the eyes or nose Rash or skin eruption	**Febrile syndrome with symptoms of bleeding**	Fever lasting less than three weeks Rash Epistaxis Hemoptysis Other symptoms of bleeding	**Virus** Severe dengue Chikungunya Hantavirus Ebola Marburg Lassa **Bacteria** Typhoid fever Leptospirosis **Malaria**
Key: Cases in a nearby geographical area. Relationship between cases. Tendency to worsen.				
Fever and neurological symptoms	Persistent fever Stiff neck/limited neck flexion Gait abnormalities Abnormal behavior Seizures or convulsions Lack of movement in certain parts of the body	**Febrile syndrome with neurological symptoms**	Fever **Neurological abnormalities:** Acute deterioration of mental function Acute paralysis Seizures Meningeal signs Involuntary movements Absence of underlying disease	**Meningitis (viral, bacterial, or fungal)** **Encephalitis:** Eastern equine Western equine Venezuelan equine **Viral hemorrhagic fever:** Chikungunya Dengue Ebola Lassa Marburg Zika **Acute chemical poisoning:** Lead Mercury
Key: Cases in a nearby geographical area. Relationship between cases. Tendency to worsen. Cases affecting horses, donkeys, and mules.				
Fever and yellow skin	Sudden onset Persistent fever Bright yellow eyes or skin	**Acute febrile syndrome with jaundice**	Fever Jaundice of the mucous membranes and skin Choluria Acholia	**Viral hepatitis:** A, B, C and E **Vector-borne diseases (VBD):** Malaria Yellow fever Chikungunya **Bacterial hepatitis:** Leptospirosis
Key: Cases in a nearby geographical area. Relationship between cases. Vaccination history. Entry into forested or jungle areas. Cases affecting monkeys. Water contamination.				
Any signal perceived by the community as a potential risk to public health must be reported immediately				

Community or community agents		Health workers or surveillance teams		
Signal for reporting	**Signs or symptoms detected**	**Syndrome or condition**	**Technical description**	**Possible associated events**
Signals of specific cases				
Animal bite or scratch	**Bite or scratch from a wild, feral, or domestic animal:** Dog Cat Bat Fox Raccoon Monkey Wolf Coyote	**Incident involving a potentially rabies-transmitting animal**	Bite on any part of the body, covered or uncovered Licking of mucous membranes or injured skin Scratch or graze on the body	**Rabies**
Key: Cases in a nearby geographical area. Relationship between cases. Vaccination history. Entry into forested or jungle areas. Cases affecting cows, bulls, dogs, or cats. Unprovoked attack. Death of the animal. Medical assessment of a possible case of rabies or exposure to rabies.				
Venomous snake bite or a bite or sting from a spider or other venomous animal	**Species:** snake, spider, scorpion, or caterpillar	**Snake bite, or a bite or sting from a venomous animal**	Signs and symptoms Contact with, exposure to, or accident involving a venomous animal	Snake bite Envenoming from the bite or sting of a venomous animal
Key: The animal is captured (not killed). Recognition of characteristics that identify it as poisonous or venomous.				
Possible chemical poisonin	Description of symptoms that the community or community agents associate with exposure to a chemical substance	**Chemical poisoning**	Nausea or vomiting, abdominal pain, diarrhea, difficulty breathing, dizziness, fainting, seizures, loss of consciousness; burns on the skin, mouth, or lips; changes in skin color, unusual breath odor, mental confusion, irritability, muscle weakness, loss of coordination	**Chemical poisoning in an individual exposed to:** Cyanide Sarin Plutonium Asbestos Methanol Formaldehyde Lead Mercury Pesticide
Any signal perceived by the community as a potential risk to public health must be reported immediately				

Community or community agents		Health workers or surveillance teams		
Signal for reporting	**Signs or symptoms detected**	**Syndrome or condition**	**Technical description**	**Possible associated events**
Signals related to illness or death in animals				
Dead or ill animal or group of animals	Dogs, cats, or other mammals exhibiting behavioral changes, such as increased activity or seizures	**Rabies in animals** **Leishmaniasis**	Death from an unknown cause Increase in cases or clusters of cases Known signs and symptoms	**Rabies in animals** **Leishmaniasis**
	Bats exhibiting unusual behavior (flying during the day).	**Rabies in animals**		**Rabies in animals**
	Horses, mules, or donkeys exhibiting behavioral	**Rabies in animals** **Encephalitis**		**Rabies in animals** **Encephalitis**
	Ill or dead monkeys	**Yellow fever** **Rabies**		**Yellow fever** **Rabies**
	Ill or dead birds	**Highly pathogenic influenza**		**Highly pathogenic influenza**
	Increased incidence of puppy deaths or miscarriages	**Brucellosis**		**Brucellosis**
	Increase of cases in pigs	**Highly pathogenic influenza**		**Highly pathogenic influenza**
	Fish die-off	**Salmonellosis** **Cholera** **Anisakiasis**		**Salmonellosis** **Cholera** **Anisakiasis**
Environment-related signals				
Signals indicating impact on water, soil, or air	Spills or release of substances or pollutants into water, soil, or air (atmosphere)	**Contamination with hazardous chemicals**	Contamination of a water source, flora, or fauna following the spill or release of chemicals, pesticides, or heavy metals into the environment	Spills or intentional release of chemicals
Any signal perceived by the community as a potential risk to public health must be reported immediately				

Community or community agents		Health workers or surveillance teams		
Signal for reporting	**Signs or symptoms detected**	**Syndrome or condition**	**Descripción técnica**	**Possible associated events**
Environment-related signals *(cont.)*				
Signal caused by natural phenomena	Earthquakes Floods Overflowing bodies of water Flash floods or torrential rains Hurricanes Forest fires Volcanic eruption Drought Infestations	**Potential impact of social phenomena/human-caused events on humans or animals**	Emergencies caused by natural disasters Mass movements of people and animals Temporary emergency accommodations Situations warranting increased surveillance	Increased exposure to physical, biological, or chemical hazards
Signal caused by social	Situations of armed conflict Lockdowns Migration phenomenon Work stoppages or strikes	**Potential impact of social phenomena/ human-caused events on humans or animals**	Emergencies caused by human activity Involve the mass movement of people and animals Temporary emergency accommodation Warrant increased surveillance	Increased exposure to physical, biological, or chemical hazards
Any signal perceived by the community as a potential risk to public health must be reported immediately				

Source: Adapted from: Ministry of Health and Social Protection, Directorate of Epidemiology and Demography, Public Health Surveillance Group. Por mi comunidad, yo reporto. Bogotá: MSPS; 2022. Available from: https://www.minsalud.gov.co/sites/rid/Lists/BibliotecaDigital/RIDE/VS/ED/VSP/rotafolio-vigilancia-salud-publica-enfoque-comunitario.pdf.

Annex 3. Examples of indicators for community event-based surveillance

Table A3.1. Examples of management indicators for community event-based surveillance

Indicator or activity	CEBS phase	Function	Calculation
Stakeholder mapping completed	Strategic planning	Stakeholder mapping	Mapping that includes stakeholders and community structures
Stakeholders advocating for the incorporation of CEBS	Strategic planning	Advocacy and stakeholder mobilization	Number of stakeholders involved in advocacy
Collaboration agreements established for CEBS	Strategic planning	Governance	Number of collaborative agreements for the implementation of CEBS
Institutional actors involved in CEBS	Strategic planning	Governance	Number of institutions involved in implementing CEBS
Regulatory framework developed or adapted for CEBS	Strategic planning	Adaptation of the institutional and legal framework	Regulatory framework incorporating CEBS
Integration of surveillance strategies	Strategic planning	Adaptation of the institutional and legal framework	Public health surveillance guidelines integrating CEBS
Incorporation of CEBS into health planning	Strategic planning	Adaptation of the institutional and legal framework	Sectoral plans that include CEBS in their strategies
Incorporation of CEBS into disease control, elimination, or eradication programs	Strategic planning	Adaptation of the institutional and legal framework	Sectoral plans that include CEBS in their strategies
Standard operating procedure for CEBS	Strategic planning	Adaptation of the institutional and legal framework	Standard operating procedure for CEBS

Table A3.1. Examples of management indicators for community event-based surveillance *(cont.)*

Indicator or activity	CEBS phase	Function	Calculation
Operational information system for CEBS	Operational planning	Adaptation of the institutional and legal framework	Operational CEBS information system
Financial resources allocated to CEBS	Strategic planning	Resource allocation	Total financial resources allocated directly to the implementation of CEBS
Human resources assigned to CEBS	Strategic planning	Resource allocation	Number of people assigned to organize CEBS
Manual of roles and responsibilities available	Operational planning	Defining roles and responsibilities	Completed manual of roles and responsibilities by level and stakeholder

Source: The authors.

Table A3.2. Examples of process indicators for community event-based surveillance

Indicator or activity	CEBS phase	Function	Calculation
Coordination mechanism in operation	Operational planning	Coordination mechanism	Coordination mechanism operating at the national and subnational levels
Institutional CEBS teams	Operational planning	Assembling teams	Number of CEBS teams by administrative level
Trained CEBS workers	Operational planning	Training plan	Number of institutional health workers trained in CEBS
Municipalities involved in CEBS	Operational planning	Community engagement	Number of municipalities involved in CEBS
Communities involved in CEBS	Operational planning	Community engagement	Number of communities involved in CEBS
Institutional CEBS teams receiving technical support	Operational planning	Technical and operational support	Number of institutional teams receiving support
Surveillance protocols incorporating CEBS	Implementation	Preparation of key documents	Number of surveillance protocols that incorporate CEBS
Registered community agents	Implementation	Integration and empowerment of community agents	Number of community agents registered in the national CEBS network
Trained community agents	Implementation	Integration and empowerment of community agents	Number of trained community agents
Community agents with basic supplies	Implementation	Integration and empowerment of community agents	Number of community agents with basic supplies for CEBS

Table A3.2. Examples of process indicators for community event-based surveillance *(cont.)*

Indicator or activity	CEBS phase	Function	Calculation
Number of events under surveillance	Implementation	Signal reporting	Number of events established for CEBS
Community agents reporting on average	Implementation	Signal reporting	Average number of community agents reporting per week
Average weekly reporting percentage	Implementation	Signal reporting	Average number of municipalities reporting per week
Percentage of negative reporting	Implementation	Signal reporting	Average number of community agents submitting a negative report each week
Number of cases referred	Implementation	Response	Number of cases referred through the care pathways
Number of people in the community receiving information	Information dissemination and feedback	Feedback	Number of people who receive information from CEBS
Number of feedback sessions held with community agents	Information dissemination and feedback	Feedback	Number of agents who mention receiving feedback on the report
Number of newsletters produced	Information dissemination and feedback	Information dissemination	Number of publications on the outcomes of CEBS

Source: The authors.

Table A3.3. Examples of outcome indicators for community event-based surveillance

Indicator or activity	CEBS phase	Function	Calculation
Municipalities with CEBS	Implementation	Involvement and empowerment of community agents	Number of municipalities with some level of implementation of CEBS
Percentage of priority municipalities with CEBS	Implementation	Involvement and empowerment of community agents	Number of municipalities with CEBS divided by the total number of priority municipalities
Number of reported signals	Implementation	Signal reporting	Number of signals reported through CEBS
Timeliness of reporting	Implementation	Signal reporting	Average time between detection and reporting
Number of events reported to indicator-based surveillance	Implementation	Signal triage	Number of signals considered events of interest
Number of verified reported signals	Implementation	Signal verification	Number of reported signals that were verified
Timeliness of verification	Implementation	Signal verification	Average time between reporting and verification
Number of signals addressed	Implementation	Response	Number of reported signals that received some form of attention
Timeliness of response	Implementation	Response	Average time between report and response

Source: The authors.

Table A3.4. Examples of impact indicators for community event-based surveillance

Indicator or activity	CEBS phase	Function	Calculation
Percentage of events reported by the community	Implementation	Signal reporting	Number of community-reported events divided by the total number of events
Positive predictive value	Implementation	Signal triage	Confirmed events divided by the community-reported signals
Increased system sensitivity	Implementation	Signal verification	Change in sensitivity associated with CEBS
Community satisfaction level	Implementation	Public health intervention	Percentage of CEBS perceived as good to excellent
Percentage of actions carried out by the community	Implementation	Public health intervention	Number of actions carried out by the community divided by the number of events
Difference in the timeliness of outbreak detection	Implementation	Public health intervention	Average time gained by identifying the event

Source: The authors.

The *Guidance for implementing community event-based surveillance for early warning and response to acute public health events and emergencies* is part of broader efforts to strengthen early warning and response to health emergencies in the Region of the Americas. Its creation is linked to the implementation of the *Strategy on Epidemic Intelligence for Strengthening Early Warning of Health Emergencies 2024–2029*, approved by the Pan American Health Organization, which emphasizes the need for efficient, robust systems capable of detecting, verifying, investigating, and assessing public health risks and implementing timely interventions.

Furthermore, this guidance is part of the "Pandemic Response Optimization Through Engaged Communities and Territories" project – an initiative implemented by the Pan American Health Organization and the World Bank – which aims to improve pandemic response in seven South American countries. The project focuses on optimizing surveillance and laboratory systems in border regions of the Plurinational State of Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, and Uruguay, devoting particular attention to rural and remote communities in the Amazon Basin.

In this respect, this guidance for community event-based surveillance (CEBS) addresses the need to operationalize approaches that enhance surveillance systems' sensitivity and coverage, positioning communities as key actors within early warning and response systems. It is based on the experiences from countries in the Region and on regional technical processes that have been harmonized to identify approaches, practices, and considerations to implement CEBS in various contexts.

This guidance contributes to the implementation of collaborative surveillance and multi-level capacity-building, promoting coordination among stakeholders, sectors, and territories, as well as including the community in processes to strengthen preparedness, response, and resilience for acute public health events and emergencies.

PAHO
Pan American Health Organization
World Health Organization
Americas Region
www.paho.org
9 789275 131442