



Community-Based Surveillance:

guiding principles

March 2017

© **International Federation of Red Cross
and Red Crescent Societies, Geneva, 2017**

Copies of all or part of this study may be made for noncommercial use, providing the source is acknowledged. The IFRC would appreciate receiving details of its use. Requests for commercial reproduction should be directed to the IFRC at secretariat@ifrc.org.

The opinions and recommendations expressed in this study do not necessarily represent the official policy of the IFRC or of individual National Red Cross or Red Crescent Societies. The designations and maps used do not imply the expression of any opinion on the part of the International Federation or National Societies concerning the legal status of a territory or of its authorities. All photos used in this study are copyright of the IFRC unless otherwise indicated.

Cover photo: A man talks to a family about recent occurrences in their village in the Kambia district of Sierra Leone as part of the Red Cross Community Events Based Surveillance (CEBS) program. CEBS acts as an early warning system for communities. Local Red Cross volunteers monitor their communities for signs of Ebola so that any suspected cases can be isolated and taken for treatment as soon as possible. Victor Lacken/IFRC.

P.O. Box 303
CH-1211 Geneva 19
Switzerland
Telephone: +41 22 730 4222
Telefax: +41 22 730 4200
E-mail: secretariat@ifrc.org
Web site: www.ifrc.org

Community-Based Surveillance - guiding principles
1313400 03/2017 E

Follow us on:     

Community-Based Surveillance: guiding principles

March 2017

The International Federation of Red Cross and Red Crescent Societies (IFRC) is the world's largest volunteer-based humanitarian network. With our 190 member National Red Cross and Red Crescent Societies worldwide, we are in every community reaching 160.7 million people annually through long-term services and development programmes, as well as 110 million people through disaster response and early recovery programmes. We act before, during and after disasters and health emergencies to meet the needs and improve the lives of vulnerable people. We do so with impartiality as to nationality, race, gender, religious beliefs, class and political opinions.

Guided by *Strategy 2020* – our collective plan of action to tackle the major humanitarian and development challenges of this decade – we are committed to saving lives and changing minds.

Our strength lies in our volunteer network, our community-based expertise and our independence and neutrality. We work to improve humanitarian standards, as partners in development, and in response to disasters. We persuade decision-makers to act at all times in the interests of vulnerable people. The result: we enable healthy and safe communities, reduce vulnerabilities, strengthen resilience and foster a culture of peace around the world.

Table of contents

Acknowledgements	4
<hr/>	
Foreword	5
Abbreviations and acronyms	6
Glossary	7
<hr/>	
Introduction to Community-Based Surveillance	9
Background and aims	9
Audience: for whom is this guide written?	10
Methodology	11
How to read this guide	11
<hr/>	
Section A: Understanding Community-Based Surveillance	12
What is Surveillance?	12
What is Community-Based Surveillance?	13
Different types of disease surveillance systems	14
The rationale: How does CBS strengthen health facility surveillance?	17
When and where can CBS add the most benefit?	18
What are the different types of community surveillance?	20
1. Community Event-Based Surveillance (CEBS)	20
2. Community-Based Health Surveillance (CBHS)	22
3. Taking it one step further to understand CEBS and CBHS	24
Combining CEBS and mobile technology	26
Legal and ethical considerations of data collection	26
Community engagement	27
Health authority coordination	28
Is CBS right for a community right now?	28
<hr/>	

Section B: Five key steps in CBS 30

The five key steps of Community-Based surveillance	30
Step 1: Detection: What is an alert?	30
Step 2: Triage: The gathering of information	32
Step 3: Verification: Local health trained staff	33
Step 4: Risk assessment (outbreak investigation)	35
Step 5: Response	36

Section C: Operational Aspects of Community-Based Surveillance 39

How to read this section of the guide	39
Where to start?	40
1. Compile the evidence to support the feasibility of CBS in your context	40
2. Design a CBS project	45
Monitoring and Evaluation (M&E) Framework	52
References and further reading	56

Annex 1: CBS Team members 57

Annex 2: Examples of alert triggers 59

.....

Acknowledgements

.....

International Federation of Red Cross Red Crescent Societies (IFRC) have worked with National Societies to develop effective tools, and gained valuable experience using Community-Based Surveillance (CBS). Norwegian and Haitian Red Cross Societies, along with IFRC, piloted CBS for cholera in hard-to-reach, rural communities in Haiti in 2014, and more recently during the Ebola Viral Disease (EVD) outbreak in West Africa.



Foreword



Epidemics are a constant threat to the well-being of communities everywhere, and more especially so in societies where resources are scarce. Managing epidemics, or preferably preventing them, is a priority for the International Red Cross and Red Crescent Movement. The role of communities in preventing, detecting and responding to local health threats is critical in improving the lives of millions across the world. One of the principal advantages of community-based surveillance (CBS) is that it ensures effective communication of unusual events or changes in the health status of residents in a community to authorities and, importantly, gives a voice to communities. This channel of communication enables an early detection and response to potential epidemics, making it possible to stop them before they start.

With 190 National Societies and 17 million volunteers, the Red Cross is uniquely placed to implement CBS in collaboration with local Ministries of Health and partners to ensure the early detection of public health threats, and to taking pre-emptive action before the situation worsens. Taking an all-hazard approach to health threats, CBS supports the early detection of human, animal and environmental changes that could impact health outcomes .

This set of guiding principles, builds on the field experience of many communities, as well as the National Societies that support them. These principles will continue to be refined as the experience and lessons from implementing CBS is gained across the world, supporting communities to play an essential role in their own health security and contributing to improved resilience of those most at risk.

Dr Julie Hall, MBE, MBBS, MPH, FFPH
Director, Health and Care



Abbreviations and acronyms

AWD	Acute watery diarrhoea
CEWS	Community Early Warning System
CBHS	Community-Based Health Surveillance
CBS	Community-Based Surveillance
CBHFA	Community Health and First-aid
CEBS	Community Event-Based Surveillance
CEWS	Community Early Warning Systems
CHO	Community Health Officer
DERC	District Ebola Response Council (Sierra Leone)
DRR	Disaster Risk Reduction
EBS	Event-based Surveillance
ECV	Epidemic Control for Volunteers
ERC	Ebola Response Consortium (Sierra Leone)
EVD	Ebola Viral Disease
EWARN	Early Warning and Response Network
HMIS	Health Management Information System
IDSR	Integrated Disease Surveillance and Response.
IFRC	International Federation of Red Cross and Red Crescent Societies
IHR	International Health Regulations (2005)
KAP	Knowledge, Attitude and Practice
M&E	Monitoring and Evaluation
mHealth	Mobile Health
MoH	Ministry of Health
MoHS	Ministry of Health and Sanitation (Sierra Leone)
MSPP	Ministry of Public Health and Population (Haiti)
ORS	Oral rehydration salt
PAHO	Pan-American Health Organization
RAMP	Rapid Mobile Phone-based Survey
RC	Red Cross or Red Crescent
SMS	Short Message Service
SLRC	Sierra Leone Red Cross
VHF	Viral Haemorrhagic Fever
VS	Volunteer Supervisor (Sierra Leone)
WHO	World Health Organization

Glossary

Aggregated Report	A single document that compiles individual volunteer alerts or daily case numbers into one (combined) report.
Alert	The notification or communication of a (pre-agreed) unusual event or potential case of disease occurring in a community under surveillance.
App	A self-contained program or piece of software designed to fulfil a particular purpose, downloaded by a user as an application (App) in a mobile device.
Clinical case definition	A set of standard criteria for determining whether a person has a particular disease or health condition. Used by health-trained professionals.
Community case definition	A few easily identified symptoms that are used to broadly represent a specific disease. Used by non-trained community members.
CBS	Community-based surveillance is a surveillance system that monitors a broad range of information directly from community members.
CBS project	A CBS activity that runs for a short, defined timeframe and can be activated or hibernated according to community needs. This stands in contrast with longer-term RC programmes that often run continuously throughout the year (i.e. Early Warning Systems).
CEBS	Community event-based surveillance. This is sometimes referred to simply as Event-based surveillance (EBS).
Cluster	A group of similar events that are grouped in time and place.
Event-based surveillance	The collection and data management of all available sources of information in order to detect a public health event as rapidly as possible. This may be achieved through hotlines, data-mining, and community surveillance.
Epidemic	The occurrence of multiple cases of a particular type of disease, chronic condition or injury that could reasonably be expected in a given area, or among a specific group of people, over a particular period of time.
Epidemic-prone disease	A communicable disease likely to cause an epidemic or disease outbreak.
Event	An event that occurs or takes place in a community.
False positive alert	An alert that is investigated further and found not to represent a true risk to health.
Indicator-based surveillance	A surveillance system performed mainly through healthcare facilities reporting on a weekly and monthly basis.

Integrated Disease Surveillance and Response (ISDR)	IDSR relates to the Technical Guidelines for Integrated Disease Surveillance and Response in the African Region. It is the recommended framework to perform public health surveillance in the WHO African Region. In this region, countries develop a national framework for disease surveillance based on the IDSR framework.
Morbidity	The incidence or prevalence of a disease or of all diseases.
National disease surveillance	The system implemented for communicable disease surveillance at a country or national level. In the WHO Africa Region, this strategy is referred to as 'Integrated Disease Surveillance and Response'. The name will differ from country to country.
Magpi	Commercially available mobile data collection software. Collects data from SMS and Apps to an online server. This software application was formerly known as EpiSurveyor.
Monitoring	Closely following the trend of a specific health condition or disease in a population under surveillance.
Public health surveillance	The systematic ongoing collection, collation and analysis of data for public health purposes, and the timely dissemination of public health information for assessment and, as necessary, a public health response.
Report	A collection of information, usually not for urgent communication, given in one document or SMS (i.e. a daily report of cases from CBS volunteers). A report that combines data from different sources or different individuals is called an aggregated report.
Rumours	Unverified information regarding any type of unusual event heard via any informal sources.
RAMP	Rapid Mobile Phone-based Survey. Tool and guidelines developed by IFRC for the use of mobile phones in digital data collection. Often used for Knowledge Attitude and Practice (KAP) surveys and in malaria programmes. Uses Magpi or ODK software.
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.
Specificity	The ability of a system to avoid identifying false cases.
Trigger	An agreed event or community case definition that if identified warrants an alert to be sent.

Introduction to Community-Based Surveillance

Background and aims

The millions of volunteers that make up the International Red Cross and Red Crescent Movement are vital in providing frontline response when emergencies strike, as well as in the context of longer-term activities aimed at improving the health of communities. One area of strength within the Red Cross/Red Crescent (RC) Movement is responding to community disease outbreaks. Many outbreaks begin with a cluster of unwell people, or sudden deaths in a community, that is not detected early enough by traditional surveillance systems. Often the community is aware of the health threat but the people who can mobilize response resources receive this information too late to limit the spread of a disease and save as many lives as possible.

Establishing a community-based disease surveillance system is key step to improving the early detection and assessment of outbreaks. This in turn triggers a RC front line response. Community-Based Surveillance (CBS) activities and outcomes empower the community to identify the risks they see and hear about, and provide a reliable 'real-time' communication structure to alert others, giving a voice to existing local knowledge to identify public health crises as early as possible. Community participation and engagement and a reliable response network are key features of an effective CBS.

Many countries have existing national disease surveillance and response systems that monitor activities within health facilities, and detect diseases with high epidemic risk or that are of public health concern. The International Health Regulations (IHR) adopted in 2005 emphasized the benefit of public health surveillance in communities and health facilities. The IHR (2005) are aimed at improving global health security, and call on countries to acquire and strengthen capacities for the rapid detection of public-health risks, as well as prompt risk assessment, notification and response to these risks (WHO, 2005). Health surveillance partnerships are encouraged as the resources required can be a limitation, particularly in rural areas (Kuehn, 2007). A community public health surveillance gap exists in many countries and the RC Movement can work with health authorities to develop and strengthen existing CBSs, in accordance with IHR surveillance requirements .

CBS is a simplified way of using available mobile technology to monitor 'unusual events' at the community level, and acts as a proxy for formal community health surveillance. National surveillance systems are often severely tested in low-resource settings, remote communities and during humanitarian emergencies, resulting in a delayed awareness of the needs of an affected community.

CBS is useful as it can temporarily replace a non-functioning surveillance system, or it can strengthen an existing national disease surveillance system to ensure EARLY DETECTION and EARLY RESPONSE. The RC Movement has the resources to monitor community events during health emergencies and can also respond when needed.

CBS is a simple, adaptable and low-cost public health initiative, that is managed by communities to protect communities. It aims to extend the coverage of existing surveillance to the most vulnerable populations in times of greatest need. Where available, using mobile technology can result in lower costs, real-time reporting and a timely response. CBS builds on RC expertise with Rapid Mobile Phone (RAMP) based activities and complements many existing programmes, such as the Community Early Warning Systems (CEWS), Community-Based Health and First Aid (CBHFA) and Epidemic Control for Volunteers (ECV), and contributes to the achievement of Sustainable Development Goal 3 (Ensure healthy lives and promote well-being for all at all ages). CBS makes it possible for RC volunteers to bolster surveillance within their communities in coordination with local and national health services.

This guide focuses on the use of CBS within three contexts:

1. During an established disease outbreak to monitor epidemiological trends and to inform response operations.
2. During humanitarian emergencies (natural, man-made or complex) in order to monitor epidemic-prone diseases, or events of potential public health importance once community participation in the Early Warning and Response Network (EWARN) has been activated.
3. In complex environments where national surveillance systems are not functioning correctly, or where there is limited surveillance coverage, or where community reports of unusual events may identify health risk sooner rather than later.

CBS is a sensitive and scalable form of community surveillance that makes it possible to expand the range of activities that RC volunteers can offer to benefit their communities. The use of CBS in emergency operations works best with pre-emergency CBS planning so that the tools can be rapidly set up under conditions of pressing needs and time constraints. It is also possible to continue CBS during recovery operations to monitor the health needs of recovering communities.

This document aims to provide an understanding of CBS and how it can be used in the countries where RC volunteers are involved in strengthening existing national surveillance, as well as RC activities. Building stronger community resilience is at the heart of the community work of all RC National Societies; building the surveillance capacity for the community, and by the community, forms part of this work.

Audience: for whom is this guide written?

.....

These guiding principles will support National Societies to clarify what CBS, how it could be used in their context and how it can help to save lives. It has been prepared for RC health programme staff, delegates and other organizational partners to enable them to support their communities, as well as national authorities to detect and respond to health threats through the use of

.....

CBS. Red Cross/ Red Crescent volunteers will also benefit from this guideline and the CBS toolkit specifically written for volunteers.

Background and operational information

Section A provides an overview of CBS, how it can be adapted in different contexts, how it can complement existing RC programmes, and how it can strengthen national disease surveillance systems. Section B explains the steps of CBS and Section C includes the operational aspects of CBS from planning to implementation and monitoring. This guide will be most useful for those who are planning to implement a CBS project as part of a comprehensive emergency health response, but may also be used to trigger 'unusual event' alerts in complex environments where routine surveillance is non-existent.

Methodology

This guideline is built on the practical experience acquired by the Norwegian, Sierra Leonean and Haitian Red Cross National Societies and IFRC in low-resource settings. The research for this guide was drawn from sources ranging from a comprehensive literature review of peer reviewed journals, grey literature and guidelines issued by partner organizations. Red Cross/Red Crescent staff and volunteers with CBS field experience were interviewed along with key stakeholders to review lessons learnt. This process highlighted the limited amount of published literature in this area and identified the need for improved monitoring and evaluation of field experiences to build an improved evidence base. This is required to support the improvement of community-based surveillance projects.

How to read this guide

Strengthening community health surveillance is different parts of the world is being strongly promoted by several organizations, including WHO. Many RC staff and National Societies will not be familiar with some of the guidance material relating to CBS, while others will benefit from this material as it complements previous field experience. We expect a period of 'trial and error' as RCs gain more confidence and skill in implementing and conducting CBS in different countries and contexts. CBS will look different in different countries. This document will subsequently be updated with quality improvements and practical lessons learnt as progress in the field expands.

CBS presents an opportunity to RCs to work alongside other field partners. In accordance with IHR (2005) WHO provides technical support on health surveillance and increasingly in community surveillance-related activities. Some of the terminology in these guidelines replicates terms that are frequently used in the context of national surveillance systems, and is used to ensure better coordination with health authorities.

Section A:

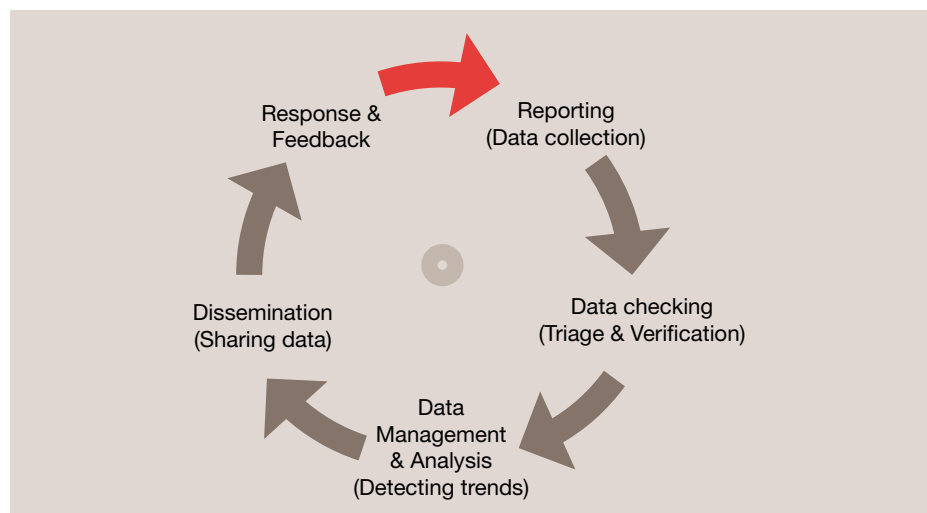
Understanding Community-Based Surveillance

What is Surveillance?

Public health surveillance is a way of detecting changes in health patterns and monitoring population trends. Surveillance aims to detect health risks as early as possible, and ensures that key stakeholders are made aware of, and receive pertinent information on, the situation. It supports the planning, implementation and evaluation of public health interventions, including emergency responses (Figure 1).

Traditionally, national surveillance systems have health-trained professionals conducting health surveillance on a permanent basis. These professionals use commonly agreed definitions (indicators) to represent a disease of interest, as well as to ensure that the same information is being collected across different locations. Surveillance systems allow the detection of outbreaks as early as possible, and make it possible to implement rapid prevention and control measures to reduce the spread of a disease. Early detection leads to early response, resulting in saved lives. The systematic collection of information (data) can occur at the health facility level (e.g. hospitals, clinics, health posts), or at the community level (e.g. villages, markets, schools, workplaces, etc.).

Figure 1: Key steps in a surveillance and response system



What is Community-Based Surveillance?

Community-Based Surveillance (CBS) is a simple, adaptable and low-cost public health initiative managed by communities to protect communities. Communities are mobilized to be aware of potential health risks, this could entail an unusual event that might indicate a new health risk, or close monitoring of an existing disease outbreak. RC volunteers transmit information to their RC branch, as well as to local health authorities. An event that appears 'unusual, odd or inexplicable' to the community might to a health-trained professional represent an early warning sign of a more serious and larger health risk.

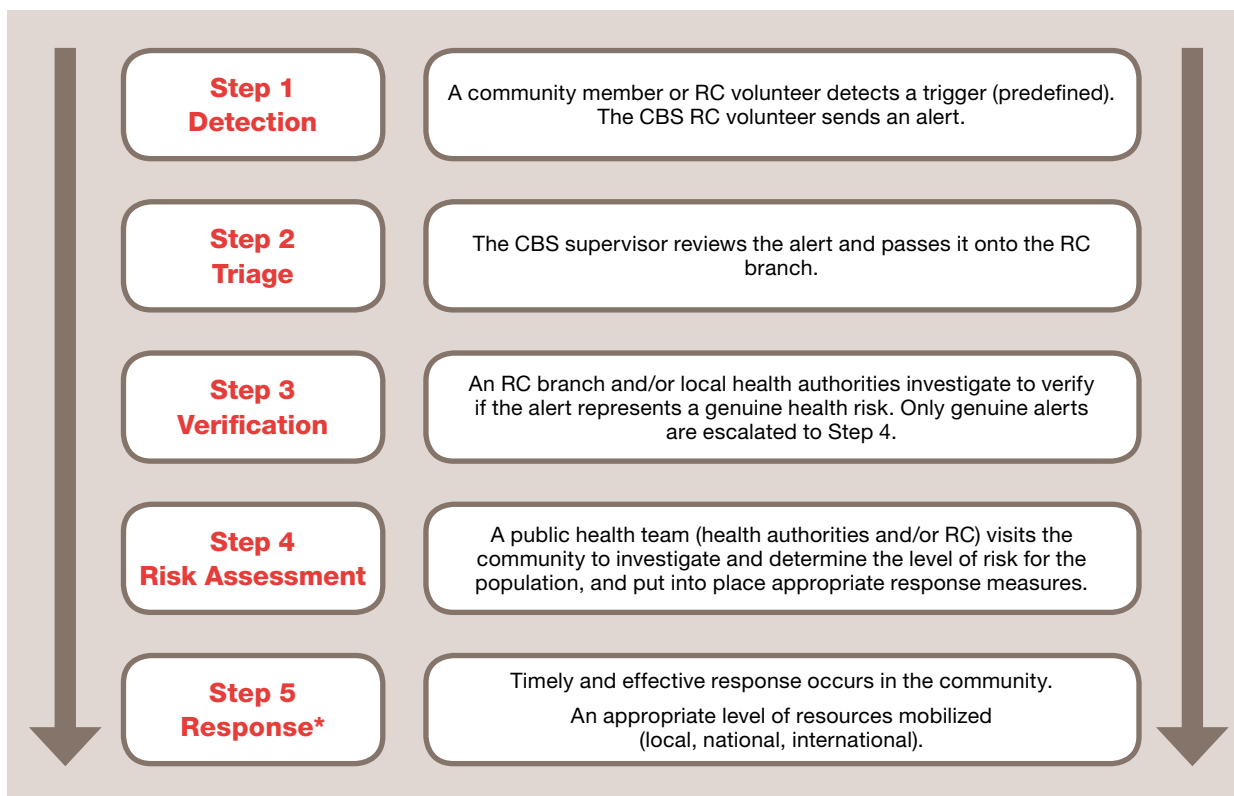
Traditionally, disease surveillance data is collected from health facilities, however, for communicable diseases this often occurs too late to protect other community members from catching the disease; neither does it prevent vulnerable community members from contracting the disease and dying. Communities are always the first to know when something is wrong. CBS provides a structure to communicate suspicious or unusual events when they first occur. However, some communities may not have access to health facilities with an effective disease surveillance system in place.

CBS empowers trained RC volunteers to report unusual events in the community where they live through the use of a mobile phone or other form of communication. It provides a structure to help organize the information that communities already have and ensures that this information is communicated in real-time and responded to rapidly. It is tailored to address the risks identified by individual communities, and is especially beneficial for populations with reduced or delayed access to health services. It can capture community-level information that might be the first indication of a potential risk to the community's health in national contexts with or without an disease surveillance mechanism. **Where possible, CBS information is combined with existing national disease surveillance and response mechanisms to strengthen and expand the coverage of the national system.**

As CBS can be resource intensive, it has not been designed to be a continuous programme in all RC contexts. Once trained, CBS volunteers can be 'activated' as needed and according to situational needs. In the early stages of CBS implementation within RCs, the focus will be on the early detection of new communicable disease risks or engaging in close monitoring of existing outbreaks. The undernourished in a community are often severely affected by communicable diseases, so community nutritional concerns can be included. As experience is gained and when appropriate, CBS can be broadened to include surveillance of additional community health concerns.

The CBS process contains five key steps that are widely used in surveillance systems all over the world (see Figure 2). The triage and verification of every detected alert is important if the health risk is newly identified, or if there is an unexpected increase in cases during an outbreak, but becomes less important once an outbreak is declared and volunteers are monitoring epidemiological trends. It is important for communication to be fed back to the community at each step, otherwise it will quickly abandon CBS if their calls for help are not answered appropriately.

Figure 2: The five key CBS steps



Note: The person conducting Step 3 (Verification) will vary from country-to-country depending on existing local health resources. Support from the local RC branch is important as many CBS supervisors will not be health professionals. In Step 5, a local response can be mobilized earlier by RC branch and volunteers if the appropriate response is already known and resources locally available.

In the Red Cross Movement, we want a community surveillance approach that has:

1. The flexibility to adapt community surveillance strategies to the needs of different communities around the world.
2. Relies on trained volunteers that can be rapidly mobilized.
3. Builds on the core work carried out by National Societies on CBHFA and epidemic preparedness and response.
4. Is responsive, i.e. it can be activated and hibernated according to community health needs.

Different types of disease surveillance systems

Public health surveillance has two main objectives:

- 1) Health system monitoring, which is normally undertaken through monthly reporting from healthcare facilities.
- 2) Early warning and response (EWAR) to identify and respond as early as possible to any public health event. EWAR needs indicator-based surveillance and event-based surveillance to be achieved. EWAR may be reinforced, or triggered in case of an emergency (often named EWARN).

Many countries already have permanent national disease surveillance and response systems in place. For example, the recommended strategy in the WHO AFRO Region is referred to as the 'Integrated Disease Surveillance and Response' (IDSR) system. Increasingly, countries are also developing Early Warning and Response Networks (EWARN) that only function during emergencies. The core reporting in national disease surveillance networks is usually carried out by healthcare workers by means of regular reports (weekly or monthly) of the numbers reportable diseases treated, and attendance in different health facility units (e.g. outpatients, maternity, surgery, etc.). Both EWARN and IDSR count the number of times reportable diseases are diagnosed by health trained staff in a health facility using a clinical case definition (see Table 1). If a concerning trend is seen, a response team is sent to investigate, but this will only occur after several reporting periods. Some rare diseases or those with significant consequences are classified as 'notifiable diseases', i.e. they will need to be immediately notified to health authorities and will subsequently generate a response.

CBS run by RC teams complements national disease surveillance and IDSR as it is composed of a network of RC volunteers (usually not health professionals) reporting in 'real-time' on community events that could impact the community's health. The aim is to improve the coverage, sensitivity and responsiveness of traditional health facility-based surveillance by adding community surveillance. It likewise provides a structure to help organize information already held by communities, and ensure that it is communicated and responded to rapidly. Under CBS, the entire community population is under surveillance, and not simply a segment of the community.

CBS is called different names and can mean different things in different countries. Within the RC Movement, CBS is an umbrella term for any type of surveillance activities that collects community-based health information. Red Cross and Red Crescent Societies use two different CBS strategies for collecting community information, and a single CBS project may use both strategies at once.

- Community Event-Based Surveillance (CEBS)
- Community-Based Health Surveillance (CBHS)

CEBS relies on reporting of unusual EVENTS: Event reporting is designed to rapidly identify whether something might be wrong in the community, or whether information is incomplete, unconfirmed and may even be a rumour.

The definition of an 'unusual event' will change from one community to another, and needs to be defined in each context. It can be one event, or a cluster of events, that may be unusual for a specific community or during a certain time of year.

- An unusual event could be: "A cluster of deaths from an unknown cause in the same household or adjacent households".

CBHS relies on reporting a suspected case or the trend of a specific disease(s) using a community case definition. A community case definition is two or three easily identified symptoms associated with a specific disease. It is simple and understood by RC trained volunteers who know what symptoms to look for. It is a more basic form of syndromic (symptom) reporting that is used by health professional in national/IDSR and other disease surveillance systems.

- Influenza (flu) community case definition: "sudden illness, fever, cough and difficulty breathing"

More detail on the design of CEBS and CBHS projects, with field examples, are presented in the next section and throughout the guide. Table 1 helps explain the difference between health surveillance systems and how they can work together.

Table 1: Comparison of different types of health surveillance and response

	Health Facility-Based Surveillance Systems		Community-Based Surveillance Systems	
	National Disease Surveillance and Response	Early Warning and Response System	Community-Based Disease Monitoring	Community Event-Based Surveillance
Name				
Purpose	Monitoring of selected communicable diseases and health facility activities	To minimize morbidity and mortality during crises, selected 'at risk diseases' that present a potential threat to the affected population	Monitoring of selected 'at risk' diseases in the community during a crisis or outbreak	Monitoring of informal information & unusual events that may indicate a disease outbreak or malnutrition crises
Timeframe	Usually continuous, year-round surveillance	Activated within the first two weeks of a humanitarian crisis.	Defined time interval - determined by community needs (Duration of the disaster, early recovery or period of community vulnerability – this could be part of long term community health programmes in vulnerable communities)	
Reporting trigger	A list of clinical case definitions (or syndromic reporting)	A selected list of 'at risk' health conditions (usually syndromic reporting)	A community case definition (simple symptoms)	An unusual events occurs in the community
Reported by	Health facility staff	Health facility staff and/or communities are encouraged to report any concerns to health staff	Red Cross volunteers	
Reported directly to	National level health surveillance		Local and/or National Red Cross staff	
Reporting format	Reporting form (often paper based)	Reporting form or mobile technology	Alert or daily report sent via mobile phone or another communication system	
Reporting frequency	Set intervals (often monthly)	Daily	Immediate and/or daily reporting in confirmed outbreaks	Immediate reporting and/or zero reporting
Data sharing	Regular national reports shared with WHO and partners	Daily report shared with cluster partners	Regular reports shared internally and externally with health authorities and stakeholders	
Example of	<p>Cholera clinical case definition (3)</p> <p>Suspected case: In a patient age > 5 years, severe dehydration or death from AWD.</p> <ul style="list-style-type: none"> If there is a cholera epidemic, a suspected case is anyone aged 5 years or more with AWD, with or without vomiting. <p>Confirmed case: A suspected case in which Vibrio cholerae 01 or 0139 is isolated in stool.</p>	<p>Syndrome reporting indicators</p> <ul style="list-style-type: none"> Fever Cough, colds or sore throat with or without fever (ARI) Fever with rash (MEA) Fever with spontaneous bleeding (AHF) Yellow eyes or skin with or without fever (AJS) Loose stools, 3 or more in the past 24hrs +/- dehydration (AWD) Loose stools with visible blood (ABD) 	<p>Community case definitions</p> <p>Hepatitis A: Fever and the skin and the whites of their eyes turn yellow</p> <p>Measles: fever plus rash</p>	<p>Unusual event reporting</p> <ul style="list-style-type: none"> >3 cases of sickness due to an unknown cause A cluster of deaths in the same household Any unusual event that raises concern, fear and alarm in the community

The rationale: How does CBS strengthen health facility surveillance?

Governments, health authorities and other partners working alongside RC often ask this question

CBS is the early detection arm of the response system for health emergencies. By providing real-time community reporting, CBS can detect the first suggestion of a looming health emergency, or provide active, real-time disease monitoring during public health emergencies. The reach and coverage of RC National Societies and their volunteers means that early detection of health threats can occur where existing traditional facility-based systems may not be able to reach, or which may not be sensitive enough to detect small changes. It widens the surveillance net to reach communities, or provides a surveillance system where none previously existed. This captures health events that are not collected by health facilities. Real-time reporting generates a more rapid investigation and response than is feasible using traditional surveillance methods.

Strengthening existing surveillance systems from a local to a national level is a key part of CBS. To be effective, CBS projects should be planned and implemented in close coordination with all relevant stakeholders, including communities, governments, health authorities, WHO and other partners. This ensures the integration and harmonization of surveillance systems, and that early detection leads to results in rapid verification and response. All stakeholders should agree on the processes and responsibilities related to data sharing, reporting and response to ensure a collaborative approach.

Red Cross Red Crescent volunteers engaged in CBS are trained to actively seek out and report information in the communities they live in. A large part of the health awareness, knowledge and skills needed by CBS volunteers is taught through the core competencies of the CBHFA, ECV and RAMP toolkits. CBS builds on existing RC programmes, and contributes to enhancing healthy living and saving lives.

Many communities already benefit from multi-hazard CEWS. However, CBS focuses on public health surveillance, and is structured to systematically report unusual events that the community may or may not recognize as a health threat.

CBS adds benefit by:

- Widening the reach of existing national surveillance and response (IDSR).
- Filling the gap if no disease surveillance system currently exists in that community.
- Sharing real-time information between communities, RC and the local healthcare system.
- Complementing and strengthening of existing RC programmes (CEWS, CBHFA, ECV, RAMP).
- Empowering the community to monitor their own health risks.
- Creating a strong bond between community needs and public health actions.
- Improving access for populations that may not access health facilities because of distance, cost or traditional beliefs.

CBS may not add any benefit if:

- An effective system for reporting community health information already exists.
- If it creates a parallel surveillance system that is not integrated within an existing system.
- If a reliable verification and response system is not sustainable.
- If no agreement exists with relevant partners to share and report the information.

When and where can CBS add the most benefit?

CBS aims to fill specific health information gaps and protect communities. The community context (or environment) will help determine the objective and the best CBS surveillance strategy to achieve it. Each National Society will need to adapt these guidelines to their own context in line with government surveillance policies and RC fundamental principles.

Communicable Disease Outbreak

During a confirmed disease outbreak, a CBS system can be used to monitor the impact on the affected community, to test the effectiveness of the outbreak response, or for active case finding. As required, CBS can be operated for the duration of the outbreak, as well as into the recovery phase.

The aim in deploying a CBS system is to establish a more focused surveillance on a specific disease and monitor the disease trend in the community under surveillance. Community case definitions or disease specific event triggers are used. Information collected may include the number of suspected cases in the community, the numbers of those beneficiaries accessing RC outbreak response activities, and deaths that may be due to the disease. Combined with national disease surveillance, CBS information helps give a more complete picture of the true burden of an outbreak and the adequacy of a response.

Humanitarian Emergencies (natural or man-made)

Many communities have RC-managed CEWS to identify and protect against multi-hazard events that often cause humanitarian emergencies, such as floods. Once an emergency strikes, national disease surveillance and response may temporarily not function when most needed. Some countries activate EWARD during disasters to collect daily health facility data and encourage community reporting. With prior planning, CBS can systematically add community information to an existing EWARD, or function as an EWARD if none exists. Having CBS in place also ensures that the community's voice is captured and responded to, and doesn't leave detecting a health risk up to chance.

Different types of natural disasters affect communities differently, but rapid access to community surveillance can prevent large outbreaks and save lives. Natural disasters have a detrimental impact on health outcomes as epidemic-prone diseases can break out because of disrupted water supplies and sanitation facilities, poor living conditions, and population movements. Additionally, the ability of clinics and hospitals to treat patients is often reduced.

As a community EWARD function, CBS may potentially be the only community monitoring system that the affected community has, at least for some time. It does not by any means represent a substitute for a permanent national surveillance system, but is rather used to complement an existing system. Broad unusual event-based surveillance is needed in order not to miss anything; such surveillance is also beneficial as we can detect at-risk diseases by using community case definitions. CBS can operate into the recovery phase.

Complex environments

Many of the challenges experienced in humanitarian emergency contexts can prevail for months, or even years, in contexts known as "complex environments". South Sudan, Central African Republic and Somalia are examples of countries where prolonged conflict has been impacted by droughts, floods and epidemics, leading to the creation of a complex environment. National disease surveillance may not be reliable in all parts of the country and access to health care is variable. With active community participation and RC branch support, CBS may operate on a longer-term basis depending on the sustainability of the CBS design and the needs of the community.

What are the different types of community surveillance?

As we have seen, different CBS (CEBS and CBHS) strategies are used to collect different sets of information. CBS is not a 'one size fits all' project and will operate differently in different countries. At the planning stage, specific events or community case definitions are selected as alert triggers; each trigger collects information on the health concerns of a particular community or crisis. Community Event-Based Surveillance (CEBS) can be very broad (sensitive) and cover a range of public health risks; in contrast, CBHS is more focused on monitoring selected at-risk diseases or a declared outbreak (specific).

1. Community Event-Based Surveillance (CEBS)

What is an event?

WHO (2013) defines event surveillance as the "capture and analysis of any information from outside the health facilities (hospitals, clinics, health posts) about health-related events which could represent a threat to human health".

CEBS captures unstructured information that might otherwise escape a national surveillance system. Red Cross Red Crescent volunteers often hear information from household members during CEWS or CBFHA activities, local media or rumours circulated at the community level, at school, or in the marketplace. CBS volunteers are trained to send an SMS immediately if they hear information that meets the reportable event trigger (specific to each CBS project).

Examples of reportable events:

1. Suspicious or unusual events that could represent a risk for human and/or animal health;
 - A cluster of deaths in the community (animal or human deaths).
 - A rumour of unexplained deaths (e.g. due to witchcraft).
2. Suspected epidemic-prone diseases;
 - A cluster of unwell people or animals with similar symptoms.
3. Unusual events that carry a potential risk to human health but don't immediately cause a communicable disease.
 - A change to the community environment / land (A new or unusual smell in the community may represent a chemical spill or environmental pollution that threatens health).

Before being escalated, an EVENT is verified and assessed by professional health personnel (see Figure 1). There may be any number of reasons that an event is reported, but an outbreak investigation (or risk assessment) is needed to determine what caused the event, the risk it poses to the population, and determine the appropriate response.

Case study 1 – Sierra Leone 2014-2015: CEBS in a disease outbreak context

In 2015, the Sierra Leone Red Cross (SLRC) implemented a CEBS programme for active EVD case finding in order to rapidly detect suspected EVD cases in the communities. This was part of a national EVD CEBS system coordinated by the Ebola Response Consortium (ERC), which comprised the Ministry of Health and Sanitation (MoHS) and several non-governmental partners. The aim was to fill identified EVD surveillance gaps, including low sensitivity and specificity, and to better detect potential EVD cases and delays in surveillance response times.

The Sierra Leone Red Cross (SLRC), supported by IFRC, was responsible for CEBS in three of the 12 districts of Sierra Leone. Over time and as the numbers of EVD cases fell, SLRC decided to create a broader CBS programme by adding specific triggers for other diseases with epidemic potential, as well as event triggers for fires and flooding. This aligned the CBS programme with recovery efforts and other existing SLRC programmes (CBHFA and DRR), making it more sustainable and tailored to community concerns. A total of 846 SLRC CEBS volunteers were trained to detect and immediately send an SMS alert to their volunteer supervisor if any one of six triggers (below) were talked about or seen to occur.

Community case definition triggers:

- 1) **Viral haemorrhagic fever (EVD/Lassa fever) trigger:** fever and two or more of the following symptoms (severe headache, fatigue, muscle pain, vomiting, diarrhoea, abdominal pain, or unexplained bleeding).
- 2) **Acute watery diarrhoea trigger:** three or more episodes of watery diarrhoea in one day (especially adults).
- 3) **Measles trigger:** fever and a skin rash that is flat and spreads from the face/neck, and has cough, runny nose and/or inflamed eyes.

Event triggers:

- 4) **Death event trigger:** A community death is any death occurring the community, irrespective of cause of death, or whether this cause is known or unknown.
- 5) **Flood event trigger:** Water levels reaches beyond an agreed community-specific early warning point, or if flooding is visible.
- 6) **Wildfire event trigger:** A fire (intentional or unintentional) is no longer controlled and threatens the community's livelihood, livestock, household, or human health.

Other partners were operating EVD-specific CEBS in adjacent districts of Sierra Leone using the six event triggers below. These triggers were captured by SLRC triggers one and four, which allowed SLRC CEBS data to be added to the national CEBS programme reporting.

- Two or more family or household members become sick or die within a short space of time (less than seven days).
- Anyone becomes sick or dies within three weeks of taking part in an unsafe burial or washing/touching a corpse.
- Any healthcare worker or traditional healer becomes sick or dies of an unknown cause.
- Any traveller (or recently returned traveller who is from that village) becomes sick or dies
- Anyone who is a contact of a suspected EVD case (regardless of whether or not they were being contact traced) becomes sick or dies.
- Any unsafe burial or washing of a dead body that took place in the village or surrounding community (*this trigger event would alert the surveillance and response team that there might be a case in the near future*).

Why include animals?

There is increasing awareness of the link between animal health and human health events. About 75 per cent of recently emerging diseases affecting human health are of animal origin (WHO, 2010). Detecting diseases that affect animals is important as they may pose a risk to human health and could save lives. An initiative called 'One Health' is a worldwide concept for expanding collaboration between animal and human health experts.

Rift Valley fever is a viral infection that originates from livestock and is then transmitted to humans through mosquito bites. It occurs during the rainy season and a cluster of deaths or abortions in animals (often sheep) might be the first indication of a risk to human health; communities then face potential food and economic losses if their animals are dying.

Avian flu is another example of a viral infection that mainly affects birds but has been passed on to humans through contact with birds. It is then transmitted from human to human and can cause large outbreaks of severe influenza.

2. Community-Based Health Surveillance (CBHS)

In CBHS, one or more specific disease(s) of interest are looked for in the community with a focus on epidemic-prone diseases, e.g. cholera or measles. CBHS can be used to monitor the first few cases of a disease in situations where the alert indicates a potential outbreak. This functions in the same manner as an event-based mechanism, such as CEBS, but differs in that it is more disease specific. Alternatively, CBHS can be used during a declared outbreak to monitor the outbreak trend, or to monitor for higher than 'normal' numbers of suspected cases of endemic diseases. For example, community 'X' has always registered cases of malaria, but the caseload can increase rapidly after the rains, and a health intervention could save young lives.

What is a community case definition?

Diseases are generally identified by one or two key symptoms seen in an infected person. These symptoms can be easily established by non-health trained volunteers, or self-reported by suspected cases. Together, these key symptoms form a community case definition. This allows for the collection of information, such as the number of cases seen or treated during an epidemic and/or active case finding. The data collected by the community-based surveillance system can be added to the national surveillance system, and then reviewed by the Ministry of Health to give a more complete picture of the outbreak (Care, 2008).

Examples of community case definitions include:

Malaria: "a fever that goes up and down, with spells of extreme heat and shivering".

Cholera: "sudden onset of watery diarrhoea".

A community case definition for malaria will hopefully capture all cases of malaria but will also likely capture other similar febrile illnesses that are not malaria. A correct diagnosis can be established by a health-trained professional, as well as through laboratory testing.

Note: *The design of a CBHS project can require a more advanced knowledge of public health disease surveillance, but gives more specific information than reporting "unusual events". With the right guidance it can also ensure very useful community monitoring during outbreaks and following natural or man-made disasters.*

Case study 2: CBHS in Haiti, 2014

In Haiti, the Pan-American Health Organization (PAHO) and Haitian Ministry of Public Health and Population (MSPP) conducted cholera surveillance from cholera treatment units and clinics. The cholera epidemic also affected rural communities that did not have any access to health clinics. The Haitian Red Cross established that there was an information gap in existing cholera surveillance and response systems as cases from these communities may have gone unreported. Together with health authorities and community leaders they set up Oral Rehydration Solution (ORS) points and a CBDM project. The aim was to identify community cases of 'acute watery diarrhoea' (AWD)*, and close the information gap for selected vulnerable and hard-to-reach communities. Haitian Red Cross volunteers were trained to detect and report the same community case definition across five categories; two age groups (<5 and > 5 years), if the patient was referred to a clinic and deaths. Using the same age group cut-off allowed for easy integration of community-level data into the national cholera surveillance.

Each volunteer sent a daily SMS with the number of cases seen in each category, this information was aggregated into one daily report for the national cholera surveillance system.

- 1) Watery diarrhoea in children aged under 5 years.
- 2) Watery diarrhoea in children aged under 5 years referred to the health centre.
- 3) Watery diarrhoea in children aged over 5 years.
- 4) Watery diarrhoea in children aged over 5 years referred to the health centre.
- 5) Death (any age) due to watery diarrhoea.

* Cases of AWD were defined as 'new cases' when the volunteer were informed of them, and only reported once.

NB: In 2014, CBHS was referred to as Community-Based Disease Monitoring in Haiti.

Case study 3: A hypothetical example of an EWARN (CEBS & CBHS) following a disaster

The use of CBS in a post-disaster context has not yet been implemented by the RC Movement, so this case study serves only as an example of how it might function when applied.

The Asia-Pacific region is often affected by severe tropical weather systems, including cyclones. This can result in communities being displaced, living in temporary shelters and crowded conditions, which increases the vulnerability of concerned populations, and can increase the risk of communicable diseases. The national surveillance system is often disrupted, despite the existence in several regional countries of a pre-planned EWARN systems that can be rapidly established in health facilities.

This would be the ideal situation to implement a community EWARN system using trained volunteers to add community-level information to the existing EWARN. Together community leaders, RC and health authorities could use CBHS methodology to identify the most likely disease threats for the affected population. Looking at vaccination coverage, living conditions and known endemic diseases would be helpful. Additionally, informal event reporting is included to have a sensitive surveillance system that captures an unusual event that might be a health risk.

Red Cross/Red Crescent volunteers would be trained to detect and immediately send an alert via SMS if any one of six trigger events listed below were talked about or witnessed. As an EWARN, a rumour of a case of any of these three diseases generated an immediate SMS alert.

- 1) Fever plus rash plus ≥ 1 of (cough, runny nose, itchy eyes) in children < 5 years [*measles*].
- 2) Fever plus rash plus bleeding in any age [*dengue, an endemic area and increased stagnant water*].
- 3) Sudden onset of watery diarrhoea in over 5 years [*cholera*].
- 4) Fever plus yellow skin or eyes in any age [*leptospirosis is endemic, increased rats*].*
- 5) Event: Any unexpected death in the community (rumour or confirmed).
- 6) Event: Any unusual event including a cluster of illness.

* This broad community case definition may also capture dengue, severe malaria with liver failure and hepatitis A but should not miss leptospirosis.

Strengthening the link between existing RC programmes and CBS

There are many different threats to the health of a community. In this guideline, CBS focuses on the early detection of communicable diseases and malnutrition threats, however other multi-hazard programmes linked to disaster risk reduction (DRR) and community early warning systems (CEWS) are also relevant in the context of CBS. It is important that the community knows they can report anything that concerns them. The Sierra Leone CBS programme described in the first case study has recently been integrated with a CEWS programme to include fire and flood hazard alert triggers, in addition to the existing alert triggers set up for CBS.

3. Taking it one step further to understand CEBS and CBHS

In the case studies above we have seen that different types of CBS projects collect a variety of information which are used to achieve surveillance goals. CEBS captures a very broad (i.e. very sensitive) range of information for all types of public health events of importance, while CBHS is more focused on specific disease(s) (i.e. it is more specific and less sensitive). CBHS is still sensitive as we use broad community case definitions, but it captures information on the specific disease we want to monitor.

Understanding the strengths and weaknesses of a sensitive or specific CBS system helps us to know which sets of information each approach will capture, and the workload that will be required at all levels (sustainability). The country context and CBS project aim will help determine if a sensitive system or a more specific one is the best fit in each situation.

What do we mean by a sensitive surveillance system?

It is important that staff designing a CBS project and those involved in verification (health managers and CBS supervisors) understand the strengths and limitations of a sensitive surveillance system, such as CEBS. An 'unusual event' trigger can generate many alerts as it is designed to not miss an abnormal public health event, hence its designation as a sensitive surveillance system.

CEBS collects unfiltered information. We do not know in what form the 'risk' information will be heard (rumours, media, animal or human deaths, etc.), so we want to capture anything that may be unusual to ensure that we will not miss an important event. In CBS, and especially with CEBS, there is the potential to have a very sensitive system that triggers many alerts. It is unlikely that 100 per cent of alerts will be verified as a genuine health risk. After verification, some alerts will be dismissed as 'not a health risk' (i.e. a false positive alert). This is especially true when the CBS team gains experience, but the alert triggers would need to be revised if it continues as such a sensitive system will probably not constitute a sustainable workload. On the other hand, receiving a few false positive alerts is better than missing that one "unusual event" that turns out to be a genuine major health crisis.

High sensitivity versus practical sustainability

A very sensitive CBS programme (using very broad CEBS triggers) which captures every disease risk sounds appealing, but comes with the challenge of not being sustainable for RC volunteers and staff and partner organizations. A 'too sensitive' system will trigger too many alerts with a high number of false positives. In such a situation, CBS becomes time and resource intensive, and the programme will likely fail. It is better to balance lower sensitivity with a more sustainable programme that detects major health event of public health importance ahead of time but perhaps not detect smaller public health events as promptly. CBS is not designed to be a surveillance and response system to ANY health issue in ANY individual living in that community.

Prior planning will result in a sustainable design, a manageable timeframe, and will ensure that CBS is beneficial and not draining for the community and RC.

- Select clear alert triggers to notify of the highest priority health events
- Have well-developed procedures for training, data management and volunteer support
- Ensure close integration with any existing national surveillance systems
- Seek technical help locally and internationally as needed. (See Section C, Box C)

What do we mean by a specific surveillance system?

CBHS collects information on one or more specific disease(s). Using the example of the dam, we can adjust the height of the floodgate to filter the river water and only allow debris meeting our community case definition to enter the dam. This is more specific for the disease we want to monitor but less sensitive for any public health event.

CBHS is useful during a disease outbreak, or following a natural disaster, or when you know the disease has been in the area before, and that the risk of that disease has changed for one or more reasons, e.g. the occurrence of cholera following a flood, or cases of measles among displaced populations.

As seen in the Philippines case study, we can combine CEBS triggers with CBHS triggers in one CBS project to help increase the sensitivity in a disaster setting where anything can and will happen, while still retaining surveillance for specific disease in that region.

How to strengthen a sensitive surveillance system?

We all know that when we receive too many SMS messages that do not interest us, we read the first few and then begin deleting or ignoring the other messages without reading them. This is one of the risks of a sensitive surveillance system; i.e. if we have too many false positive alerts reported directly to health authorities they might stop listening to Red Cross/Red Crescent CBS information as it may be considered to be unreliable too often.

The CBS supervisors and local branch both play a part in strengthening the system by acting as a filter. An alert is first triaged by the CBS supervisor, verified by the local branch and only escalated to higher authorities if found to be a genuine alert. This ensures that the communities concerns are acknowledged and investigated, but does not overwhelm the health authorities unnecessarily.

Combining CEBS and mobile technology

The implementation of CBS via short message service (SMS) reporting is a relatively new use of mobile Health (mHealth). By training community volunteers to report alerts via SMS, the need for separate data entry is removed and it also makes it possible to real-time communication. When implemented effectively, CBS via SMS provides rapid, highly sensitive and adaptable health monitoring.

CBS via SMS can be done with entry-level low cost mobile phones as well as smart phones. Many illiterate volunteers are often numerate and already use SMS functions. A regular SMS is sent via the mobile network to an internet-based software program, such as Magpi (formerly EpiSurveyor), which captures the data and forwards the volunteers' SMS to the CBS supervisor's phone. Similar software programs can support many CBS components, as well as receive SMS alerts, collate SMS data for analysis and data sharing, and serve as a platform for data storage.

Using automated SMS data collection is not the only way to collect and share CBS information. CBS is successfully deployed when communities and the people living within them drive the project by monitoring the occurrence of disease events. When information is collected and shared on a regular basis, communities are empowered to drive health monitoring in their community.

In some countries, particularly during conflict, monitoring of mobile phone communications may put an individual at risk. **If access to SMS data management technology is not available, then a normal SMS or phone call will work. It is now increasingly rare to have absolutely no network access, but a bicycle messenger or another local communication system will also work.** The communication system needs to work for the community using it.

Legal and ethical considerations of data collection

CBS trains RC volunteers (and community members) to be on the 'look out' for particular health concerns in a community and report them as soon as they are detected. There is a clear benefit to the health and safety of the whole community, but the privacy and rights of individuals within this community also need to be protected. Collecting and sharing information that identifies an individual (name, age, sex, location, illness) can potentially stigmatize, or put that individual or even a whole community at risk.

Health-trained professionals are taught to protect the privacy of people they care for and to work in an ethically sound manner. While the structure of CBS projects are country specific and that news travels fast within communities, early support from a health-trained professional to further assess an alert contributes to the privacy of individuals and rumor-mongering. An initial alert is designed to only communicate that a trigger has been detected. Ideally, a health-trained professional is responsible for escalating any identifying information to help maintain individual privacy.

Public health surveillance is not normally subject to the same level of ethical approval that is required for research projects, but local regulations for data collection nonetheless exist in many countries. Any collection and reporting of data needs to meet high ethical standards and be managed in accordance with existing ethical regulations in the country concerned.

Data collection should be:

- Used to protect a community or implement/revise an intervention that will benefit the surveillance population.
- Only collected if truly needed.
- Disseminated as widely as appropriate, but making sure that the data is de-identified.
- Be collected by the least intrusive and most cost-effective method available.

Managing an ethically sound system of surveillance and interventions also calls for the approval of the community and close coordination with health authorities and other partners. Protection of confidential information and community engagement on the purpose of CBS, and the outcome of alert investigations can prevent misinformation and rumors. Misinformation can potentially damage the reputation of an individual as well as the RC Movement as a whole, and can put individuals at risk of violence and/or threats. Anticipating and addressing any potential consequence of data collection for RC volunteers and community members is an essential part of CBS planning.

Further reading on the ethics of data collection in the field is available at: http://conflict.lshtm.ac.uk/page_12.htm

Community engagement

Community engagement is an important dimension within the RC movement and across RC programmes, and is not unique to CBS. Community engagement includes participation, consultation and involvement of the community; community engagement is aimed at empowering it to improve the health and safety of its own population. Including community members in the planning of CBS will help ensure it is efficient and effective. Community motivation is a strong driving factor. CBS requires volunteers and community members to be dedicated to monitoring for events before they have occurred, i.e. being vigilant before 'the storm' often takes a higher level of motivation than responding once 'the storm' has hit and the needs are clearly visible.

A successful approach to community engagement is easy to write on paper but harder to achieve in reality. It requires open communication and collaboration, which can take time, patience and sometimes compromise and persistence. Community engagement is not gained in one meeting. Community commitment and inclusiveness will ensure accountability and transparency of CBS activities. Sensitizing the whole community may require meeting different levels of community representatives to ensure they all understand what the CBS volunteers are looking for, who they send information to, how this information is to be used, and also that CBS volunteers are not usually health-trained professionals that can respond to all health issues.

One way to evaluate the level of community engagement is to gauge the extent of decision-making the community, and their level of influence over the purpose, scope and outcomes of CBS.

Health authority coordination

Continuous engagement with health authorities, WHO and other relevant stakeholders is equally important. Understanding and recognizing that CBS will not be a stand-alone project is important in many contexts. Where relevant, CBS aims to strengthen existing national surveillance programmes, which are normally managed by health authorities and supported by WHO. Community surveillance forms part of the monitoring obligations of WHO Member States vis-à-vis the IHR (2005) requirements.

Establishing or joining an existing regulatory surveillance group with representatives of different stakeholders involved in activities is one way to have efficient coordination and communication.

Consider establishing an agreement with health authorities and other stakeholders on the following issues:







- Need for and benefit of RC CBS, and benefits of working in partnership.
- Need for a surveillance regulatory group.
- The objectives of the RC CBS intervention in the chosen context (*Which area of the country CBS will operate and the duration of operations*).
- Inclusion of any other stakeholder in CBS training (*if involved in an alert investigation, the inclusion of all partners involved in the CBS system, including outbreak investigation team*).
- Legal and ethical requirements regarding data collection and sharing.
- Which organization has responsibility and oversight for the coordination of surveillance capacity and resources at different levels (*community, district, national*).
- Integration into any other existing surveillance system.
- Data sharing: With whom, how often and data protection issues.

Is CBS right for a community right now?

A common theme in this guideline is that CBS is flexible and adaptable, it is a community surveillance system that can be turned 'on' and 'off' as needed. Simplicity, low-cost and complementarity with other RC programmes are some of the other positive features, but there are situations where CBS might not be advisable.

Table 2 includes some '**red flags**' to think about when considering the possibility of using CBS in **your context**. If applicable, **STOP** and take the time to evaluate these issues.

Table 1: Community-Based Surveillance Red Flags: Applying CBS to your context.

	Red flags		Next steps
Does a need really exist?	Another type of community-based health or event surveillance may already function in the community. <i>Maybe it is referred to by another name.</i>		Consider focusing volunteer efforts on other identified gaps instead of CBS if a successful community-based surveillance programme already exists.
Community engagement	The community does not want or see the benefit of CBS, or has unrealistic expectations of the proposed project.		Take time to involve volunteers and the community from the start. Avoid having unrealistic expectations of CBS in the community.
Existing community barriers	Community barriers to surveillance often exist, including fears of: <ul style="list-style-type: none"> • Negative consequences of reporting from other people • What the information will be used for • Who will the data be shared with • Using technology • Different cultural beliefs 		RC staff and volunteers live and work in these communities; if supported, they can address existing fears and concerns. The community must want CBS or they will not use it. Consider another community with needs, choosing the right community is important.
National society capacity (feasibility)	Does your National Society have the time, motivation and financial support to set up and monitor a CBS project for the chosen timeframe?		Identify the issue(s); access technical expertise via IFRC and partner National Society.
	Do you have sufficient volunteer commitment in the chosen community?		CBS can function with a few dedicated volunteers but requires considerable set-up resources, especially at first. Don't spread your volunteer's commitments so thin that other RC activities may suffer.
	Is mobile phone use and coverage feasible in this community, or a nearby community?		Most communities now have mobile network access but check coverage in different weather conditions and months of the year. Would a non-SMS data collection system be better in this context?
Partner coordination	Coordination with existing surveillance is strongly recommended. Do you have the support of health authorities (MoH)? Do you have data-sharing and response mechanism agreements?		Non-integrated CBS may not provide the desired result, but can be considered if no other options exist. Seek technical support if this is the case.
Agreed response mechanism	Having a reliable, timely response mechanism within RC, or between RCs and other stakeholders is necessary. A tried and tested mechanism is preferred where available.		It is unethical to set up a timely reporting system if an equally responsive verification and response system is not available. Spend time establishing a response coordination before proceeding with further CBS planning.

Section B:

Five key steps in CBS

The five key steps of Community-Based surveillance



This section aims to explain how an SMS alert generates a response and excludes false positive alerts. These five progressive steps are the basic component of many disease surveillance and response systems. Using the same name or terms for the different steps enhances coordination with health authorities, WHO and other stakeholders as everyone involved understands the same language.

Step 1:

Detection: What is an alert?

CBS trains RC volunteers to be messengers for their communities and to transmit these messages using mobile phones

Early in the CBS planning phase, discussions are held in the community to clearly identify the risks that most concern them. A limited number of reportable triggers, i.e. events or community case definitions, are designed to monitor these risks. Having a maximum of four triggers is recommended, but no more than eight should be used to make SMS reporting easy for volunteers. Field experience shows that volunteers cannot easily remember multiple or long alert triggers. This is surveillance, not a survey.

Through community engagement, members are asked to notify their CBS volunteer if they see or hear anything unusual. Other community members, such as teachers, religious leaders traditional healers and birth attendants, all have access to valuable community events.

Section B: Five key steps in CBS

CBS volunteers also actively seek this information and send an immediate SMS alert to their CBS supervisor if a reportable trigger is identified. This SMS only ‘alerts’ the supervisor that a particular trigger has been identified, it gives no additional information of the actual situation but escalates an alert to Step 2. Communicating limited information helps maintains best practice on individual confidentiality. (See section on the legal and ethical considerations of data collection).

More examples of reportable triggers include:

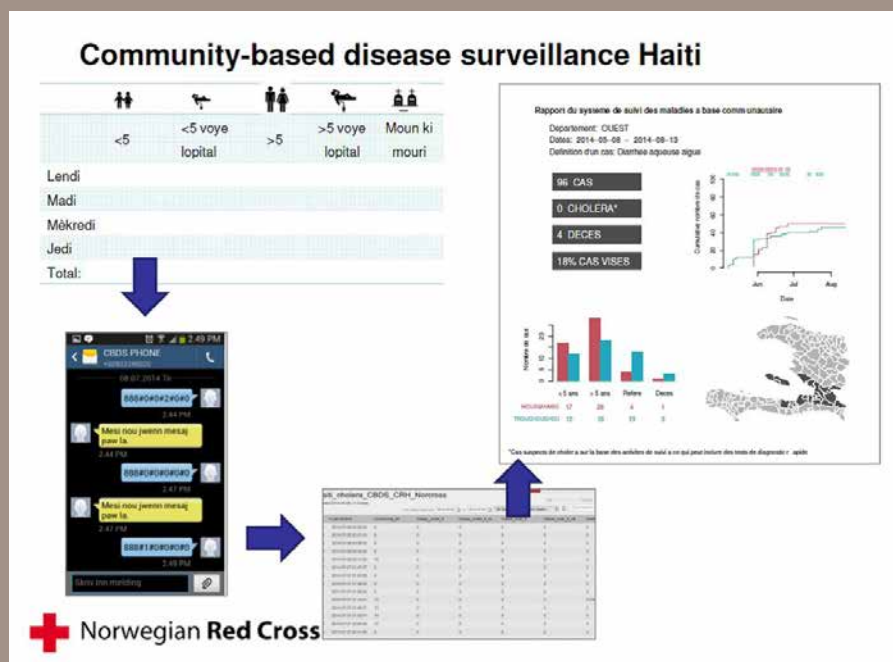
- Event: A cluster of human or animal deaths (occurring closely together).
- Community case definition for Meningitis: A case with fever and a strong headache and a stiff neck.

A CBS supervisor may be assigned to several communities or chiefdoms (see Annex 1). CBS volunteers are able participate in other community programmes, helping them stay connected with their community and informed of local current events. Using multi-skilled CBHFA and ECV-trained volunteers for CBS is beneficial as they can use their knowledge to provide initial responder actions if safe to do so while they await the next step.

Communication: Volunteers reassure the community that an SMS alert has been sent and, where appropriate, advocate on topics such as health promotion and community first aid.

Case study 2: CBHS (CBDM) in Haiti: Cholera

CBS volunteers monitored an established cholera outbreak using a community case definition (<5 years, >5 years, referral status and death). Cholera is known to be present, but do not wish to generate an alert for every detected case, but do want to know how many cases there are. In affected communities, each volunteer sends a daily SMS report by 4 pm; an SMS reporting zero cases is sent if no cases were seen that day. In areas with no recent cases, the daily SMS is not sent if no cases have been notified, but zero reporting is nonetheless sent by SMS twice a week. A single end of day data report was fed back to the health authorities (MSPP).



Case study 3: EWARN (CEBS & CBHS) in the Philippines

Active monitoring of epidemic-prone diseases needs to take place following a natural disaster. CBS volunteers can be trained to detect agreed triggers and **immediately** send an SMS alert (or another communication form) if any one of six trigger events are talked about or witnessed. Other community members are also engaged to notify the CBS volunteer. The aim of CBS here is to act as an early warning system before an outbreak is declared, so that rumours of any of these three diseases generates an immediate SMS alert. A zero report could be sent via SMS every second day if no triggers were found.

Different types of CBS reporting

In the examples above, we introduced two new reporting concepts, as well as the notion of an immediate SMS alert taking the form of a daily SMS report and zero reporting.

A daily SMS report: During an **established disease outbreak**, a single 'end-of-day' SMS report might be chosen instead of immediately reporting each suspected case that meets a community case definition. We know there is an outbreak and expect several cases, so we adapt the CBS system. This is useful for looking at trends, counting daily cases and clinic referrals of a particular disease or beneficiaries of RC response activities. Both an SMS alert and SMS daily report can be used. A daily SMS report of cases and an immediate alert SMS trigger is to be used if an unusual event or an escalation in the situation occurs that cannot wait until the end of the day (i.e. if more than the expected number of cases are seen, a threshold can be set for immediate SMS reporting).

Zero reporting: Where possible, 'zero reporting' should be included as a safety measure. Each volunteer sends a report at an agreed time interval, even if they have seen no alerts. This might be daily or weekly depending on the situation. This has three functions: (a) it avoids confusion if no SMS report is received for volunteers seeing no triggers; (b) it quickly identifies any technological problems preventing reporting; and (c) it helps to keep in touch with CBS volunteers to maintain their interest and involvement in the project.

In Sierra Leone, CEBS volunteers were asked to send a 'zero' report once a week if they had not reported any trigger events in the past seven days. In such cases the CBS supervisor established days and times (twice a week) when the CBS volunteer was expected to call to confirm that there are no alerts.

Step 2:

Triage: The gathering of information

Triage is another word for 'sorting'. The supervisor relays the alert to the local RC branch health staff. In Step 2, the CBS supervisor with the support of local RC branch health staff begin gathering basic information to help sort genuine alerts from those that are clearly not. This step provides a quality check for the RC CBS projects and ensures that RCs are passing on information to local health authorities that is as accurate as possible. It is good practice for an RC to have some initial information on the alert before notifying health authorities in Step 3.

This preliminary information gathering may start with a phone call from the CBS supervisor to the CBS volunteer, followed by a visit to the community by the CBS supervisor along with a RC health professional. **They quickly assess the situation that generated an alert.** Accurate information helps an RC and others to understand the risks and properly respond and escalate, as required. Communication skills learnt in CHBFA will be useful here. **Enough information can be collected in Step 2 to dismiss an alert if it is not a true health risk and no further escalation is required.**

Volunteer safety is very important. CBS training needs to include basic infection control measures and safety procedures as volunteers might be in the middle of a potential outbreak and need to know how to protect themselves and others, particularly if they begin first responder duties.

Questions to ask:

1. What is the nature of the event.
2. Duration of the event: Has it ended or is it still ongoing?
3. Has this happened before, what was the outcome last time?
4. What are the numbers of people affected?
5. Is the community taking any actions already?
 - *If a genuine health risk is present at this stage, verification and response may take place at the same time.*

In some cases, the CBS supervisor will be able to quickly determine if the alert is genuine risk or not. It is good practice to discuss the alert with health professionals at the RC branch, as not all CBS volunteer supervisors will have the same level of health training to be able to make this decision.

In some countries, Step 3 may also be conducted only by RC health staff (without local health authority assistance). A quick Step 2 assessment may overlap with the verification investigation in Step 3, in which case they can be carried out concurrently. Steps 2 and 3 are not in-depth assessments, this comes in Step 4 once a genuine alert has been verified.

Communication: When launching an initial investigation, an RC team visiting a community will seek to reassure the community. At this stage, health messaging can be reinforced, and efforts can be made to empower the community to implement hygiene promotion, ECV tools. and confirm to the community that the RC branch will be notified.

Step 3: Verification: Local health trained staff

One or two health-trained person(s) should **verify the alert within 24 hours** of the original SMS alert. Verification is often done via a small investigation led by health-trained professionals. This step allows local health authorities to assist in verification, which will be a requirement in some countries. Before a larger public health team is mobilized to assess the risk (Step 4), we want to know if the alert is genuine and warrants the mobilization of resources. This is

essential to avoid overwhelming health authorities with unnecessary information or rumours that do not turn out to be genuine alerts.

A member for the local health authorities and/or health trained staff from the local RC branch (as per country agreement) completes the investigation started in Step 2. Relying on a health-trained professional is important as: (a) it helps maintain health confidentiality principles; (b) it supports CBS trained volunteers; and (c) demonstrates to the community that CBS volunteers are not ultimately responsible for the decisions made following an alert.

If the alert is launched in accordance with the CBHS system (i.e. a community case definition), 'a death due to acute watery diarrhoea', then the broad nature of the alert risk is already known. In CEBS event reporting, the alert will usually indicate that a type of 'an unusual event' has occurred, and Steps 2 to 4 need to take place to establish the nature of the risk.

Verification may involve:

1. Cross-checking information, by re-interviewing key contacts and accuracy of facts.
2. Reinforcing infection control and prevention measures, and community case management (according to CBHFA and ECV toolkits).

If the alert is found to be genuine, it is escalated to the health authorities and RC headquarters through pre-agreed channels. Depending on the situation, RCs may be able to begin preparing for and mobilizing resources (CBHFA and ECV-trained volunteers) if there is a strong possibility that there may be an epidemic or health risk looming.

An alert that does not represent a potential health risk is not escalated any further. An explanation is communicated back to the community to reassure them, and maintain confidence in the valuable contribution of CBS.

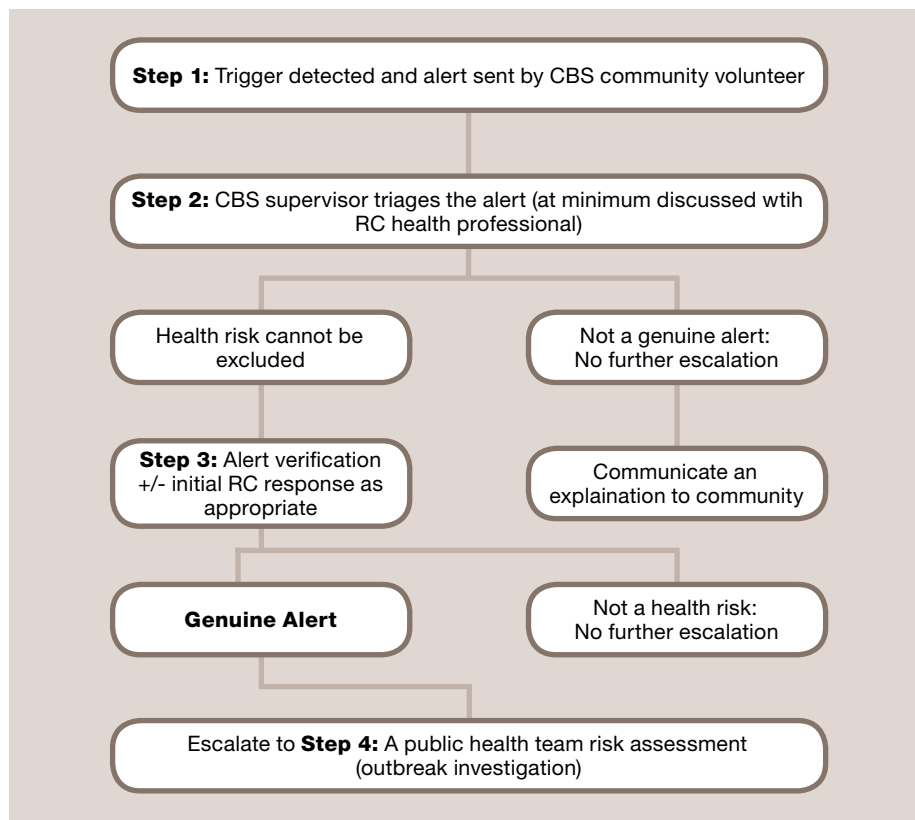
Case study 1: Sierra Leone, Ebola Virus Disease Outbreak (2015)

Upon detecting an agreed SLRC trigger, CBS volunteers sent an immediate SMS to their volunteer supervisor (VS). They are trained to safely provide first responder response activities, where appropriate.

The VS is equipped with a motorbike and works with the local MoHS Community Health Officer (CHO) to triage the alert and collect information. *In this case study, Steps 2 and 3 are carried out by the VS and CHO.* If not a cause for concern, the alert is then dismissed. If verified to be a genuine disease alert, the CSS or CHO escalate the alert to the District Ebola Response Council (DERC). A district case investigation team was dispatched to further investigate the case and perform risk assessment. Flood and fire alerts were escalated to the district Office of National Security.

Communication: Re-assure the community if the risk is not found to be genuine or if genuine, let them know that a full investigation will take place very soon. Community meetings, message boards or other local tools are used to communicate the outcome of Step 3 to the community. A genuine risk is also communicated to health authorities and RC headquarters.

Figure 4: Verification cascade of alerts to ensure that only genuine health risks are escalated to a higher level



Step 4: Risk assessment (outbreak investigation)

This step introduces a team of specialized health professionals to conduct the outbreak investigation. In many countries government health authorities will lead this team as they have the authority to formally declare an outbreak. An in-depth assessment aims to: (a) confirm the existence of an outbreak; (b) confirm the disease (laboratory testing); and (c) identify the source and potential for the disease to spread further. Furthermore, it determines the impact on the affected and surrounding communities to help build an appropriate response intervention or monitoring tool.

Outbreak investigation is a specialized skill and requires people trained in this area of work. A team of public health experts from an RC, health authorities or other partner organizations (as per the country agreement) are involved. In many countries, this team will involve members of the national surveillance and response team (as agreed in the planning phase), or could even include international experts.

The information collected in this step can also be collected using mobile technology. A standard questionnaire is designed to capture all the required information. This is easier to complete on a smartphone or tablet and uploaded via

the internet, but can also be done on paper and then entered electronically if smartphones are not available.

Below are examples of activities that can be carried out during a risk assessment:

- Confirming the disease (by obtaining samples to be sent to a reference laboratory)
- Confirming the extent of the outbreak, number of cases affected, deaths and their location
 - Vaccination status and coverage, where relevant
 - Other similar cases in the community,
 - Geographical, personal and time relationships
 - Attendance at healthcare facility or traditional healer
- Investigating any outcomes (e.g. deaths, case management details, health of affected staff)
- Determining the source and mode of transmission and the risk to surrounding communities
- Checking prepositioned stockpiles
- Characterizing the nature of the risk
- Advising on appropriate response measures and estimation of immediate and longer-term needs (i.e. safe water supplies, bed net distribution, vaccination campaign, indoor spraying)
- If necessary, defining an 'outbreak' community case definition to begin monitoring cases
- Developing and communicating public health messages in the affected and surrounding communities
- Communicating the outcome of the risk assessment to an RC team, health authorities, partners and affected communities or more widely, as appropriate.

Note: In Steps 1 to 4 many of the same questions will be asked and answered at several levels, namely the local RC branch, and health authorities in the, national Ministry of Health and National Society headquarters. Importantly, the community will also be asking and regular communication is needed to keep everyone informed, and to help them understand the risk.

Communication: Members of this team will be used to effectively communicate with communities and health authorities. Clear communication of the level of risk and any safety messages is extremely important in these early stages as community fear and confusion can be very high. How this initial engagement with authorities is perceived can impact the rest of the response. A written report of the risk assessment is shared with all partners. Individual confidentiality must be respected.

Step 5: Response

CBS is the early warning mechanism of a response system. The aim of protecting communities can only be achieved if a timely and appropriate response mechanism is set in motion. Before implementation, and as foreseen in the risk assessment step, all stakeholders should agree on the organization(s) responsible for delivering and coordinating a response. A community will quickly abandon CBS if their alerts are not answered appropriately. A community may interpret an alert as a call for help.

Some alerts may require simple measures and close monitoring and others, a full-scale emergency response intervention. The response needs to be appropriate to the risk. The extent to which a RC is responsible or contributes to the response may vary greatly from one country to another. Although 'response' is shown as the final step, a community and district-level response can be started earlier if appropriate.

A comprehensive response addresses all aspects of the outbreak, including:

- Prevention and control measures.
- Case management.
- Nutrition and WASH.
- Emergency immunization campaign.
- Infection control and prevention of exposure.
- Enhanced surveillance, active case finding or contact tracing.
- PSS support for the affected population and responders, as required.

An RC may not be leading this part of the response but can become engaged in advocacy in favour of a response. Also consider the impact that an outbreak can have on other sectors, such as a household's economic and food security, access to education and routine health care for 'normal' illnesses that are not related to an outbreak or event.

Community-level response

CBS volunteers can be the first responders and take steps to make the situation as safe as possible for the community, if warranted as early as Step 1. The safety and security of the volunteer must take priority. They are usually not trained health workers and their responsibilities for case management must meet their level of training to avoid community expectations, which the volunteer may fail to meet.

Examples of first responder actions:

- Provide first aid and call or send for medical help.
- Arrange safe transportation of an injured or ill person.
- Keep people away from a 'risk' area (potentially contaminated water source).
- Isolate anyone with a potentially communicable disease.
- Provide community education.
- Engage in infection control or hygiene promotion, as outlined in the ECV toolkit. (www.ifrc.org/Global/Publications/Health/epidemic-control-en.pdf)

Case study 2: CBHS in Haiti: Cholera

CBS volunteers in Haiti received training on cholera prevention and first aid. They were equipped with a basic 'Cholera first aid kit', including water purification tablets, Oral Rehydration Solution (ORS) and soap. Volunteers were instructed to provide these items to a detected case.

Before volunteers sent an SMS alert to indicate a suspected case of acute watery diarrhoea, they would provide first aid, e.g. potentially life-saving treatment (ORS), and prevent the spread of the disease to family members and neighbours by promoting good hygiene and safe drinking water.

If the number of suspected cases reported that day was over an agreed threshold (number of cases), a response was triggered: A team of district RC staff and volunteers would visit the community to investigate the outbreak, conduct water testing, ensure supplies were sufficient, and conduct hygiene and health promotion sessions in the community together with community-based volunteers. Rapid diagnostic tests could be performed and patients transferred to clinics when the teams were accompanied by workers from the Ministry of Health.

District response

Once the alert has been verified as genuine, local health authorities and local RC branch can coordinate a district-level response while the risk assessment is being carried out (Step 4). Local resources can be mobilized and scaled up as appropriate for the risk.

It is the role of health authorities, and not that of an RC, to declare an outbreak. However, while a formal declaration may be delayed in some circumstances, this should not deter an RC from providing appropriate care to those in need.

National/central coordination response

This may or may not be required for all genuine alerts. If the local team determines that the risk is small and manageable, then the national response role may only be to monitor the situation. In a case of a large outbreak, or an unusual event of public health concern, this response activates and coordinates the mobilization of national or international resources.

Communication: Communication is very important at this stage in order to protect and reassure the community. A communication specialist is included in the response team.

Section C:

Operational Aspects of Community-Based Surveillance

How to read this section of the guide

This section is written for health programme managers at the RC district, at headquarters and IFRC delegates wishing to implement CBS at some point in time. It gives practical guidance to help put the understanding of CBS into action in your context. Recognizing that CBS is not a 'one size fits all' project, this section focuses on the commonalities and the key questions that must be defined in country. It directs you to start asking the right questions and gathering the required information to be able to plan, design and implement a successful CBS project that meets the needs of your chosen community. Planning CBS in advance can be part of emergency preparedness if you are considering using CBS in a post-disaster setting. If your CBS proposal includes several communities, it is recommended to start with a pilot in one community before expanding the project.

A well-designed CBS project is characterized by the following:

- It is driven by the community it will monitor, and supported by the RC branch and by headquarters.
- It meets the needs of the community and strengthens existing surveillance networks.
- It is coordinated with health authorities and relevant stakeholders.
- No more than eight simple and broad triggers are needed to ensure a sensitive system that will not miss a health risk.
- An established alert, verification and response system is in place and agreed with partners before CBS is commenced.
- Adequate technical support is provided, if needed.
- Starts small and is scaled up once shown to be functional and effective.
- A data analysis plan is in place BEFORE launch beginning.

Where to start?

1. Compile the evidence to support the feasibility of CBS in your context

Finding a surveillance gap and a community that can benefit by driving CBS is important.

I. Identify the community health information gap(s)

What is your context?

- A communicable disease outbreak is occurring (or predicted) and national surveillance does not cover affected communities.
- Disasters do occur in your context, which increase the baseline risk of specific communicable diseases, and you want to plan an EWARN via CBS to activate during the next disaster.
- Your country has limited national health surveillance and/or health access, and you wish to monitor community health alerts from remote, vulnerable communities.

The three boxes below are interlinked and do not necessarily need to be completed in the order given. Try to gather some initial information from all three boxes before arranging formal meetings, this will help to set realistic expectations with community and health authorities.

Box A. What information gaps exist?

Talk with community representatives, volunteers, healthcare workers, and National Society colleagues.

1. What community information already guides RC responses to community needs?

- How is information currently collected and does it allow for a timely response?
- Are any remote or vulnerable communities not reached with current activities?
- What gaps are highlighted on any recent needs assessments?
- Review recent outbreak responses, CBHFA or ECV trainings or intervention evaluations
- Does the community already have CEWS, CBHFA, and ECV-trained volunteers?

2. Does the community see a need for CBS? Take time to explain what CBS is and listen carefully to the community's responses.

- What health-related risks do they see or worry about in their community?
- What systems already exist in the community to share information?
- What community response systems already exist?
- What access is there to community health services?
- What are the barriers to community health services? (e.g. use of traditional healers)
- What organizations already support the community?
- How reliable are the mobile network services in the community and surroundings?
- Explain the 'activation and hibernation' of CBS, and also that it may not be a long-term programme.

3. What specific disease threats are most relevant to the community?

- What do many people regularly die from in this community?
- What threats are linked to the community livelihood (animals, fire, etc.).
- Collect relevant background health statistics and disease trends for previous years.
- Prioritize epidemic-prone diseases in the region.

Checkpoint 1: If you can answer YES to these questions keep going!

- ✓ Have you identified a gap in surveillance and health risks in a selected community?
- ✓ Is there genuine interest from the community to drive CBS?
- ✓ Have you encountered any 'red flags' so far that did not have a solution?
(See page 34)

II. Be informed about existing surveillance networks

Many countries have existing national surveillance and response teams and have, or are planning, community surveillance in line with the IHR (2005) requirements. CBS cannot properly function without connecting to existing health services.

Now is the time to measure the interest level of health authorities and other stakeholders. Remember that different countries have different names for community surveillance, so find out what might exist and how they refer to it.

Box B. What health surveillance currently exists and how does it function?

Meet with relevant partners (Health authorities – national and district, WHO, other stakeholders). See *Section A: Community engagement*.

1. Understand any existing surveillance systems to avoid duplication of CBS

- What health facility and community data is already being collected?
- Where is this data reported?
- Do they use the same five key steps outlined in this guide?
- How is this data shared between stakeholders?
- What ethical and legal regulations exist in country for data collection and sharing?
- Which reference laboratory is approved to confirm suspected cases?
- What national clinical case definitions are used by the MoH staff in health facilities?
 - These are usually not suitable for non-health trained personnel but will give you an idea of how your data can be added to a national report to strengthen it.
- How would RC CBS data be shared externally?
 - Shared with whom, how often, via what means, and who is responsible for this in the RC?
 - Ideally, set up regular sharing of ONLY genuine alerts so RC is contributing reliable information into a national health information system. This may not be feasible in all contexts.
 - RC internal reporting of all alerts.
 - Regulations for data protection of identifiable information passed from RC to health authorities.

2. Does this data link to, or activate, a response mechanism?

- How does this mechanism work, who coordinates it?
- Which organization is involved in the response and who is/are the person(s) responsible for activating the response mechanism?
- What is the trigger to activate a response and within what timeframe?
- Are there any funding limitations linked to an existing response mechanism?

3. What surveillance gaps do other stakeholders think exist?

- Are there any actions or proposals in planning to address this gap?

4. Partnerships: What other partners have an interest in supporting CBS?

- What other partners already have or are planning CBS projects?
- Are there any communities that have not been reached by existing CBS?
- What data do they collect?
- Can an RC coordinate this system to strengthen it and avoid duplicating efforts for the alert, verification and response?

5. Are there plans to implement any type of community-based surveillance?

If yes,

- What are other partners already or planning to do and what is their timeframe?
- Are any vulnerable communities not included in this proposal?
- Is there an opportunity or benefit for an RC to support this proposal?
- Review the 'red flags' (Table 2) and put your effort into activities not addressed by others.

If no, why not?

- What is the hurdle - Is there recognition of the gap but no capability to respond to it?
- Is the MoH interested in allowing RC operate CBS?
- Is the RC the best-placed organization to do this?

Checkpoint 2: If you can answer YES to these questions keep going!

- ✓ Do you have general agreement with other stakeholders that an RC can contribute to existing health information via CBS?
- ✓ Have you identified any ethical or legal issue related to surveillance and data collection/sharing?
- ✓ Is there an existing surveillance and response system CBS can link into?
- ✓ Have you encountered any 'red flags' that did not have a solution?

III. Does the RC have the right resources before moving forward?

Field experience has shown the set-up phase to be the most resource intensive part of CBS, but do consider the resources that would be needed for this phase, as well as the five key steps.

Box C. What resources might be needed for launch of CBS and data collection?

Community and local branch level:

Do you have a strong volunteer base for CBS?

- Make a list of all the current activities currently involving volunteers in this community?
- Consider current RC programmes, scheduled trainings, and planned activities that may overlap
- What would the right ratio be between supervisors, volunteers and community members? (Annex 2)
- How much effort will CBS require? (e.g. hours per week per volunteer)
- In an outbreak context, consider the daily reporting time
- Does your team have any RAMP experience?

What financial resources are required locally?

- Mobile phones: Will volunteers use their personal phone and only need phone credit, or will new phones be purchased?
- Who owns the phone if a new RC purchased phone is given?
- Will volunteers and/or supervisors have any additional financial needs?
- Will branch staff doing verification need a smart phone or tablet? How will the data collection be carried out in Steps 2 to 4?
- What data management staff, training and equipment are needed locally? Can this be done centrally at the National Society?
- How will practical issues, e.g. access to power, mobile networks and mobile top-up work, be addressed?

National Society Headquarters level:

Does HQ staff have the time, motivation and resources available for CBS?

- Make a list of the planned RC trainings at HQ level for the next 6-12 months?
- Are there personnel with the skill and availability for CBS set-up, trainings and ongoing support?
- What resources are already available via other RC activities that can be shared?

What support will the local branch require from a National Society HQ for set-up?

- Training facilitation (initial and refresher), mobile phone and first responder equipment
- What data management staff, training and equipment are needed at HQ?
 - Having HQ staff responsible for central data management is often practical
 - Reliable computer and internet access are required, and can be rolled out for several communities at once
 - Staff training on Magpi or selected software, software costs
 - Do you have technical support skills or any RAMP experience that will be of benefit?
- What support is needed for the coordination with local healthcare authorities?

The responsibility for alert, triage, verification and local response is usually given to the local RC branch, with the support of local health authorities.

Health authorities often coordinate the risk assessment of genuine alerts and large-scale response, with the RC assisting where it can. This is an important step to get right as the community are relying on the RC, so take the time to explore reliable partnerships and set realistic community expectations.

I. Resources for alert verification and risk assessment?

District level (triage, verification and risk assessment)

- As stated above, risk assessment is often conducted by health authorities, is that the case in your context?
- What transportation will be needed for supervisors and local branch staff?
- Is there a health-trained staff member at the local RC branch to complete verification?
- What training is needed to ensure that staff are prepared to carry out verification?
- Do they need refresher training on the ethics of collecting and responsibility sharing confidential information?
- Consider data collection via smart phone or tablet to complete a detailed questionnaire
- How will identifiable data be protected?
- How will data be cross-checked against other data and national surveillance?
- Is there any existing use of technology and have any other issues been identified? (e.g. radios, mobile phones, landlines, and community broadcasting)
- Does the RC branch have internet access to upload the verification questionnaire?
- Will volunteers or community members be put at risk based on the information that is collected or reported? Brainstorm ways to gather information that avoids stigma, discrimination and protects privacy.
- How will genuine alerts be reported to the national healthcare system?

National Society Headquarters (HQ) level: Risk assessment

- The public health skills required in the risk assessment team may exist within RC (district and HQ level) but is usually coordinated by the health authorities
- Identify the person or persons at the RC branch and HQ that has or have the skills to conduct a public health risk assessment
- Identify the person or persons at HQ that needs to be notified to support district level resource mobilization
- Who else is part of the risk assessment team and who is the team leader? (Annex 1)
- How will HQ regularly monitor the CBS programme and is an evaluation planned?

A CBS system needs to be supported by an RC or a health system to validate and respond to the alert. The key interventions and response must therefore be identified and ready to be deployed when an alert is received. Response is a core element of an RC's activities, it is therefore necessary to utilize and integrate with existing response structures rather than creating CBS specific resources.

2. Response: What role will an RC take at a local and HQ level in response?

District Level: Initial response and scalable options

- An existing CBHFA programme is a good indication that a local response will be feasible.
- Volunteers may require 'first aid' case management resources
- Make a contact list of response partners and the skills they are willing to offer
- Clearly define the responsibilities of the RC and the healthcare system at the district level
- What response is the local healthcare system able and willing to provide?
- How will RC ensure a timely response?
 - Appropriate transport, year-round access to the community
 - Location of stored equipment and resources

National Society Headquarters level: Larger scale response

- What capacity exists to provide a large-scale response in your country?
- If a national surveillance and response team exists, use it and strengthen it.
- Document the agreed response mechanism
 - What communication will be used in Steps 2 to 5? Is there a need for a back-up communication strategy?
 - What is the chain of command? Who is the Team Leader for Steps 4 and 5?
 - Who is responsible for coordinating different levels of response from different partners?
 - Clearly define the responsibilities of the RC team at the national level
 - Clearly define health authorities at national level (and what they expect locally)
 - Make a list of the roles and responsibilities of each stakeholder at each step. When this is agreed, add the name of this person, his or her position and contact details.
- Can this be aligned with existing RC and national response structures?
- How can existing RC resources be mobilized (if needed) and shared with CBS activities?
- How will the agreed response mechanism be implemented?

Checkpoint 3: If you can answer YES to these questions keep going!

- ✓ Do you have adequate resources for the five key steps?
- ✓ Have you agreed and documented roles and responsibilities for different partners in each step?
- ✓ Have you coordinated internally with the existing RC's response structures?
- ✓ Is there a reliable response system that clearly identifies the role and responsibilities of the different partners?
- ✓ Have you encountered any 'red flags' that did not have a solution?

2. Design a CBS project

This section will outline the aims and objectives of CBS; provide information on reportable trigger alerts and reporting frequency; data management (analysis, reporting, sharing); and monitoring and evaluation.

Meet again with the local RC branch, community representatives and volunteers

Community and local RC branch empowerment is needed to drive CBS. Their participation and involvement in planning will mean that CBS gains their approval and commitment and ultimately works for their community. In most cases, health staff at headquarters' level will provide technical and resource support.

i) Setting the aims and objectives of CBS:

Document your aim: This is a broad statement of what you hope to achieve by collecting CBS information. A clear aim helps to explain the purpose of the project to national authorities, interested partners, the project team, including the volunteers, and the rationale for choosing a particular community.

- What are the key strategic decisions, and how will CBS data inform those decisions?

Outline your CBS objectives: Once the surveillance information gap has been identified it needs to be translated into a CBS project objective. The objectives of your project are the broad details of what will you do to achieve the aim of the CBS. The objectives should cover the type and frequency of data being collected, reporting, the agreed timeframe and response mechanisms.

Define the estimated timeframe of CBS: Running CBS indefinitely is a big task and will not be feasible in many countries unless it is fully integrated into on-going programmes, such as CBHFA. It is more feasible to initiate CBS during an outbreak or emergency context for a limited duration. Budget limitations may also influence a CBS timeframe. **Determine the expected end date before you begin.** Consider how CBS will link to recovery efforts after a disaster or outbreak, and what other programmes will need volunteer support at different times in the response to help define an expected end date. There are many community advantages that may follow in the wake of even a short CBS project, these include: (a) creating links between the community and local health facilities; (b) increased awareness of health threats; and (c) empowering the community to manage these health threats as much as possible.

Case study 2: CBHS in Haiti

Context: An established cholera outbreak

Aim: To identify community cases of 'acute watery diarrhoea' (a proxy for cholera), provide immediate case management, and close the information gap for selected vulnerable and hard to reach communities.

Objectives:

- To establish a real-time CEBS system to detect cases of suspected cholera, including deaths, and enable a rapid assessment and response network.
- To limit the spread of cholera and likelihood of a large-scale outbreak.
- To disseminate CEBS data to other key stakeholders and strengthen the existing cholera surveillance system.
- To report this information to the national surveillance system at an agreed time interval.
- To train RC volunteers to provide immediate case management and control measures, additional measures are given in coordination with RC branch, Pan-American Health Organization (PAHO), and Haitian Ministry of Public Health and Population (MSPP)

Timeframe: Commence immediately and continue until one month after the final cholera case is reported nationally.

Case study 3: Sierra Leone, EVD outbreak (2015)

Objectives:

- Establish a system for identifying emerging clusters of EVD transmission and other health threats to the population and livelihoods at the earliest possible stage.
- Feedback information to District Ebola Response Command Centres (DERC)/DHMT and local communities to allow them to adapt and intensify real-time/rapid response to threats to the population.
- Identify and stop all chains of VHF, AWD, measles transmission in the community, and empower communities to take action to stop chains of transmission.
- Identify potential natural hazards to enable preventative and rapid response measures.
- Improve health outcomes by increasing the timeliness in which suspected cases of VHF, AWD, measles are identified and receive care.

ii) Decide what your reportable trigger alerts will be and how often they are reported:

Is your aim to monitor a specific disease (CBHS) and/or broader health event monitoring (CEBS)?

Create your triggers around what the community understand so they can alert you to information you want to hear about. If implementing CBS in one context but in several communities, use the same alert triggers for all communities to allow comparison of events and monitoring of trends.

Design your triggers?

- A trigger is an unusual event or a community case definitions.
- Agreement with other partners is important and be prepared for the time this may take.
- Keep triggers broad (CEBS) or more specific (CBHS), triage and verification will detect non-genuine alerts.
- Aim for up to four and no more than eight reportable triggers per CBS project:
 - If you cannot achieve your aim with a maximum of four to eight triggers ask for technical support to ensure the aim is simple and rationale.
 - Limit the triggers to those strictly necessary to generate an alert. Additional information can be collected during triage and verification steps.
- Triggers need to be easy to understand, read and report:
 - How will volunteers detect triggers and engage other community members to report them? Will they be passive (i.e. will they have heard about the trigger in the course of their other work), or active (i.e. volunteers will seek out information), or both?
 - Triggers need to be logical and relevant to the community and the volunteers who will report on them. If they are not designed this way, they will not be used and no reports will be produced.
 - Test (pilot) each chosen triggers before commencing at full scale.
 - When tested, did the trigger provide the information it was designed to capture?
- Changes to agreed triggers should not occur once CBS has commenced (unless to reflect a major change in your context).
- Once agreed, the order of your triggers ALWAYS stay the same to help more accurate reporting by volunteers.

Unusual event triggers (CEBS):

- How does this community understand what constitutes an ‘unusual event’?
- Do you need to capture deaths or illness, or both, to achieve your aim?
- Do you want to include animals and potential chemical spills?

Community case definitions:

- A few key symptoms that easily identify the disease of public health importance.
- Selecting community case definitions is not always easy, but many already exist that you can use. Seek help from a person with experience in community surveillance.
- They are designed for community surveillance purposes only, and not to be used by health professionals for case management
- Check how the diseases are explained and defined in the CBHFA and ECV toolkit, as designed for use by RC volunteers.
- A list of WHO standard clinical case definitions used by health professionals can also help identify what symptoms are common to different diseases, but remember it needs to be a basic community case definition. (See Annex 2 and Table 1, page 17)
- Review the clinical case definitions used by the national surveillance system and consider how CBS data will complement this system and feed data into it.
- What do the volunteers understand when they read the community case definition? Test it!

Handy tip: *Collecting too much data that is never looked into is a common error. It may happen that you get external, and occasional internal, requests to collect more information that does not match the CBS aim. What will you do?*

Remember, the purpose of CBS is to have simple notification of health alerts – this is not a survey. Complex data collection cannot be quickly set-up, can confuse volunteers and will not collect useful information, the end-result is that it does not benefit the community.

What is your SMS alert frequency and your aggregated reporting frequency?

The agreed time interval for SMS alerts and aggregated reports will depend on your context and is decided at the beginning, but may be changed if the context changes. Two types of reporting have been discussed so far and a combination of the two may be used in some contexts.

- I. **Dynamic reporting:** An immediate SMS is sent as the volunteer detects a trigger alert.
 - ❖ **Immediate SMS alert reporting:** This is the standard reporting CBS format. It involves immediately notifying the CBS supervisor of a suspected case of a case definition trigger (CBHS) or unusual event trigger (CEBS).
- II. **Regular reporting:** An SMS is sent at regular, expected time intervals (every day, alternate days or once a week) during a defined outbreak. Zero reporting is also part of this type of reporting.
 - ❖ **Regular SMS reporting:** Daily, every other day, or less frequent set reporting is useful in declared outbreak contexts. You expect some cases each day and need a daily tally of cases from affected communities. A daily SMS from each volunteer is combined into a daily aggregated report for health authorities. Reporting may be

less frequent towards the end of an epidemic or from non-affected neighbouring communities.

- ❖ **Regular zero SMS reporting:** This kind of reporting keeps volunteers engaged and avoids misinterpretation of a 'blank' or 'number missing' in an aggregated report indicating no alerts received.
 - What is the procedure when there are no cases during a reporting interval?
 - How often do volunteers need to 'check in' by sending a zero SMS report?
 - Frequent zero-reporting surveillance systems can overload volunteers and lead to poor or delayed adherence.
- ❖ **Weekly aggregated report:** A report of all the alerts received is produced at agreed intervals, often at central data management level. It includes the outcome of alert verification and the response actioned, and includes 'zero reporting'. See the next section.

Can you answer these questions?

- What other commitments do the volunteers have and what reporting frequency is feasible for them and their community? *There is no point setting a daily reporting frequency if the volunteers cannot meet it.*
- How will you follow up with a volunteer who fails to send a regular SMS report?
- How will volunteers know to stop reporting once the CBS timeframe has ended?

Checkpoint 4: If you can answer YES to these questions keep going!

1. Does each trigger help you to achieve your aim?
2. Are the triggers agreed with other stakeholders?
3. Have you tested the chosen triggers with several volunteers?
 - a. Are they easy to understand?
 - b. Would an alert for that trigger give you the information you want?
 - c. Is the order of the triggers agreed (ALWAYS the same) and documented?
4. Do you have a plan to sensitize community members to the type of information you want volunteers to be notified of?
5. Have you resisted any requests to add data to your system that will not help you achieve your aim?
6. Have you explained the agreed end date of the CBS project with the community?

A community health committee, consisting of community leaders appointed CBS volunteers under the Haitian Red Cross' CBHFA programme. The latter programme carried out the first piloting of CBS. CBS volunteers were considered to play an important role and therefore required the confidence of the community, and it was felt that they should be appointed by the committee. The training of volunteers was conducted over two days in the community where the volunteers lived, and was led by the CBHFA staff team. There was no mobile signal in the training venue, so the test survey was conducted by taking the volunteers for a walk to a spot in the community where SMS messages could be sent. This helped explain the mechanisms behind CBS to the volunteers, and broke down the data collection, reporting and analysis into logical steps. Errors in SMS reporting format were also easily spotted by everyone, and could be addressed before commencing CBS.

iii) Data analysis, reporting and external data sharing:

A successful CBS project acts as the early warning arm of a response system, and does not solely focus on monitoring. Data left in a computer and not shared cannot generate a response.

CBS data from SMS alerts and verifications is merged into an aggregated report format and shared with the community so that local experts can provide advice and context, and existing infrastructures for health monitoring and delivery, particularly with existing health surveillance mechanisms.

A data analysis plan sets out how you will clean the data (i.e. check there are no errors), what your report will include and what time interval is being reported. Keep it basic and set up statistical software for automated analysis and report generation. Although it may be necessary to 'outsource' the setting up and running of the data analysis to technical advisers, it is nonetheless important to keep the community context in mind when doing so. Analysing data remotely may be necessary but local expertise is key for understanding case definitions and potential sources for bias in the data.

Document your data analysis plan and the agreed plan for sharing the aggregated CBS report:

A RC data manager produces an aggregated report at agreed intervals.

Data cleaning: Checking that SMS reports are in the correct format to be processed by the software program.

Data analysis: This is what is included in the aggregate report that you will eventually share internally and externally, as per your agreements with health authorities and partners. The purpose of an aggregated report is to:

- Assess data trends, review and understand what is being detected by CBS alerts.
- Document the contribution of CBS teams.
- Assess how well CBS is working and identify any problem areas (e.g. alerts not verified or not verified within 24 hours).
- Provide information internally and externally to guide response operations and the strength the national surveillance system.

Data analysis: Indicators that can be included in an aggregated report

1. Date the report is produced
2. Date range of the most recent reporting period (daily or weekly, as needed)
 - Number of reporting CBS communities and volunteers (number).
 - SMS alerts received for each trigger (number of total alerts, number and percentage of genuine alerts).
 - Location of alerts if several communities are being covered (number of alerts) and genuine alerts (number and percentage, per location).
 - Timeliness of triage, verification, risk assessment and response.
 - Risk assessments performed (number and brief details).
 - Response /interventions activated (number and brief details).
3. Date range of the entire reporting period (since CBS began or summary period).
 - The same indicators are also reported (accumulated total number and percentage)

Case study 2: Haiti cholera

Rapport du système de suivi des maladies à base communautaire

Departement: OUEST

Dates: 2014-10-01 – 2014-11-24

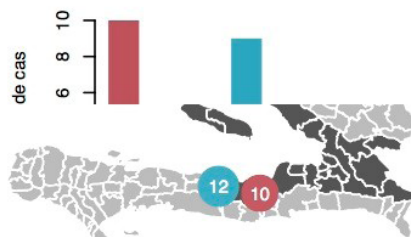
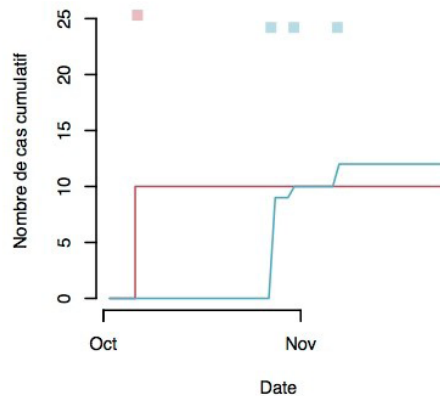
Definition de cas: Diarrhee aqueuse aigue

22 CAS

1 CHOLERA*

1 DECES

5% CAS REFERES



	< 5 ans	> 5 ans	Refere
MOUSSANMBE	10	0	0
TROUCHOUCYOU	1	9	1

Figure X: Automated, aggregated report from the Haiti Cholera CBDM. The report shows two separate outbreaks of AWD in two communities during the months of October and November 2014.

Data collection was carried out by SMS to a local network gateway. The first step in the data analysis was to check for reporting errors, i.e. SMS reports that did not fit the format of the survey. This was done initially manually in the online Magpi database. Secondly, data was exported from Magpi to another software program (r-script) to clean the data, match the SMS-reports with the name and location of the volunteer reporter and complete data analysis. The outcome of the verification questionnaire and potential response interventions were registered in a separate follow-up-sheet. A second r-script program was used for data analysis and aggregated report generation. This created a share-ready report of the current situation, where confirmed cholera cases based on the follow up and response were stratified from all reported cases of acute watery diarrhoea. The latter gave an accurate picture of the epidemic and prioritized responses among all stakeholders..

Can you answer the following?

- Which data collection software will you use and what levels of analysis can it carry out? (see RAMP toolkit).
- Who will do the analysis and report, and what training and technical support do they need?
- Who is responsible for sharing the aggregated report internally and externally?
- Who will receive the aggregated report, and how will they use it to make decisions that address the needs of this community?

Monitoring and Evaluation (M&E) Framework

Performance monitoring and evaluation is an integral part of any health intervention. It enables programme/project implementers to check progress, inform decisions and remedial action, update project plans, and support accountability. In CBS, the system itself is designed to monitor a specific health outcome, thus by default the analysis pipeline will monitor and evaluate the 'impact' any intervention. In addition, project and volunteer performance is key to monitoring in an emergency context. Two complementary approaches form the basic recommendation for monitoring and evaluating a CBS project.

Community feedback

A CBS system is useless without community and volunteer support. They must understand the benefit of the system, and that their input is valued and helps improve, or adapt, the system to work better for the community. At the same time, the qualitative feedback from volunteers and the community is an essential part of contextualising and understanding quantitative CBS data. If a report is designed between the community, its volunteers and the project management, the feedback from volunteers and community may also be helpful in explaining performance indicators. **A system should be in place from the beginning to capture community and volunteers' feedback.**

The best system is context-dependent, but may involve one or more of the following approaches for data collection:

- Open and regular community meetings where all issues are noted and acted upon.
- Focus group discussions with volunteers and/or community leaders.
- Suggestions and complaints box(es) for use in the community.
- Appointment of a community representative(s) to gather feedback and complaints.
- A communication pipeline for feedback (SMS or another communication tool).
- Red Cross hotline (beneficiary communications)

Performance indicators

Performance indicators are useful, as they will help identify whether the system is achieving expected results, or whether certain aspects need to be strengthened. An M&E framework defines the CBS indicators, calculations and methods for collecting that data, and should be combined with a basic Indicator Tracking Table (ITT), which enables the CBS project implementers to track the performance and simplifies reporting. Most of the CBS performance indicators can be calculated based on the incoming CBS data, in combination with project documents, such as volunteer registers, training reports, implementation plans, and response reports. Software can be programmed to calculate and report on the indicators on a weekly, monthly or quarterly basis, as required. A realistic approach is advised, especially when setting targets.

Community-driven data analyses and monitoring

It may be useful to support the community to undertake their own data analyses. Especially in CEBS but also CBHS, it is useful to see the impact of the work communities are carrying out. Communities can be provided basic material

to record the type of triggers they report and the resulting actions, as well as recording outbreaks or events that occurred but did not trigger an alert so that triggers can be adjusted. Within an outbreak, local recording of cases that are sent to an RC branch and HQ could be used to inform the community if cases are rising or falling, and encourage more proactive prevention interventions.

Table 3: Recommended Monitoring & Evaluation Framework for use in CBS in emergency

Indicator	Indicator definition and calculation methods	Data source	Data collection method	Types of data tools (Indicate if proposed or existing)	Frequency of data collection	Responsible person
Number of trigger alerts detected	Definition: An alert is received or in CBHS, when the number of cases reported by CBS volunteers exceeds the set threshold (and follow up confirms an alert should be issued) Calculation: Counting number of alerts received from each CBS project	CBS reports	Review of CBS reports to identify alerts	Magpi SMS received R-scripts for analysis, R-studio	Weekly / Monthly	Data Manager
Number of actual outbreaks	Definition: An outbreak that affects the CBS community, and is declared by the health authorities or requires a response. Calculation: number of outbreaks not notified by a CBS alert	Surveillance data	Review of national surveillance		Monthly	Data Manager
Number / Proportion of alerts responded to within 24h/48h	Definition: An alert is indicated when the number of cases reported by CBS volunteers exceeds the set threshold (and follow up confirms an alert should be issued). Responding to alerts is defined as a community visit for case investigation, case management, health promotion, community sensitization, and distribution of materials [Must be defined according to response plan] Calculations: Number of alerts: Counting number of responses that were initiated within 24h/48h from receiving alert / Proportion of alerts: Number of alerts responded to within 24h/48h divided by number of total received alerts.	CBS reports and response reports	Review of reports	Magpi R-scripts for analysis, R-studio for CBS reports, and reporting form for community response [to be developed]	Weekly/ Monthly	Project Manager
Number of CBS volunteers trained	Definition: CBS volunteers are community-based volunteers that have been trained to conduct CBS in their community.	Training reports and volunteer registers	Review of reports	Volunteer register and training report form	Monthly	Project Manager
Reporting rate: Proportion of CBS-volunteers who regularly reports via SMS	Definition: CBS volunteers are community-based volunteers that have been trained to conduct CBS in their community. 'Regular reporting' is defined as reporting minimum once/twice/three times per week [Must be defined according to CBS design, note that it may be unrealistic to expect all volunteers to report as agreed, and that minimum reporting requirements may be set lower than ideal reporting. For example, if volunteers are expected to report three times per week, the minimum requirement can be twice a week]. Calculation: Number of volunteers who report regularly divided by number of trained volunteers.	Volunteer reporting rate report	SMS and volunteer registers	R-script for analysing and reporting volunteer reporting rates, R-Studio	Monthly	Data Manager

Section C: Operational Aspects of Community-Based Surveillance

Indicator	Indicator definition and calculation methods	Data source	Data collection method	Types of data tools (indicate if proposed or existing)	Frequency of data collection	Responsible person
Number of communities with CBS system in place	<p>Definition: Communities as geographically/politically defined [Context dependent]. CBS system in place refers to the community having accepted and participating in CBS by community-volunteers that have completed CBS training and conducted CBS reporting</p> <p>Calculation: Counting number of communities who have implemented CBS</p>	<p>Project implementation plan, training reports and CBS reports / List of active communities</p>	<p>Review of reports</p>	<p>R-script for analysing and reporting volunteer reporting rates, R-studio, training report form [to be developed]</p>	<p>Weekly / Monthly</p>	<p>Project Manager</p>
<p>IMPACT: Percentage decline in reported [health outcome] cases</p> <p>OR: Percentage decline in [health outcome] cases</p>	<p>Definition: A reported [health outcome] case is defined as [applied case definition] that has been reported by CBS volunteers, or as registered by national/formal surveillance mechanisms.</p> <p>This indicator will depend on CBS design. It can measure impact on mortality, attack rates, incidence or prevalence depending on context and CBS design. Note that if cases are not reported, this may be due to CBS volunteers missing cases that fits the case definition, or cases not be identified by the given case definition.</p> <p>Calculation: Dependent on indicator. Note that seasonal patterns and variation may impact results.</p>	<p>CBS reports, national surveillance reports, response reports</p>	<p>Review of reports</p>	<p>R-script</p>	<p>Mid-point and end of CBS project</p>	<p>Project Manager</p>

References and further reading

CARE International (2005). *Promising practices for community-based surveillance. Experience from CARE work with community-based models of avian and human influenza surveillance in five countries.*

Kuehn, B (2007). *Global shortage for health workers, brain drain stress developing countries.* JAMA 298(16):1853-5.

World Health Organization (2013). *WHO technical consultation on event-based surveillance.* Report of meeting held in Lyon, France, on 19-21 March 2013. Geneva: WHO

World Health Organization (2010). *WHO Recommended Surveillance Standards,* Department of Communicable Disease Surveillance and Response, Second Edition. Geneva: WHO

World Health Organization (2010). *Technical Guidelines for Integrated Disease Surveillance and Response in the African Region.* Geneva: WHO

World Health Organization (2005). *International Health Regulations,* Second Edition. Geneva: WHO.

Further Reading

World Health Organization (2008), *A Guide to Establishing Event-based Surveillance.* Manilla: WHO.

US Centers for Disease Control and Prevention. *Fact Sheet: Event-based Surveillance.* Global Disease Detection Operations Center. Atlanta: CDC. Available at: <http://www.cdc.gov/globalhealth/healthprotection/gddopscenter/how.html>

London School of Health & Tropical Medicine. *Ethical issues in data collection.* London: LSHTM. Available at: http://conflict.lshtm.ac.uk/page_12.htm

Annex 1

CBS Team members

The key personnel required for each step of CBS are listed below. The personnel ratios are an approximate guide and need to be adapted to each context.

Level	Team member positions	Personnel Ratios
Community	RC volunteers	One volunteer: 500 community members
	RC CBS supervisor	One supervisor: 30–50 volunteers
District	RC branch health professional District Community Health Officer* Surveillance or public health officer*	Two trained RC branch health staff to ensure full time cover for the CBS project duration A minimum of one another WASH/ health-trained staff member to assist with verification and/or risk assessment
National	National RC Office contact	Often the Health Programme Manager for the country
	Surveillance contact point	One Surveillance or Public Health officer*
	Surveillance risk assessment and response team* <ul style="list-style-type: none"> Public health trained staff Communication specialists Logistics 	A team including the following expertise* <ul style="list-style-type: none"> Coordination (Team Leader) Epidemiologist Clinician Health services (district and national) Community representatives Logistics Water, sanitation and environment Vector control Veterinary epidemiologist, if appropriate Information and communication

* This position is often a staff member of a health authority

Recruitment and training of volunteers

The level of training required by volunteers will depend on their previous knowledge and training, the type of CBS being implemented and the technology being used. The RAMP Survey Toolkit Volume 3 has useful tips for any RAMP training, and sample agendas for a RAMP app-based survey training. In addition, the CBHS Cholera Training Manual can be used as a starting point for planning SMS-based project training.

Consider:

- Who is the most appropriate person to respond to and report to a certain disease or health event? Would it be appropriate for men to report on maternal health issues?
- Location of training: Can a mobile signal be obtained or is there internet access in the area so that a test survey can be performed and results can be demonstrated during the training?

Volunteer recruitment

How many volunteers will be required and the areas or populations they will cover is an integral part of the CBS design, and often a question of volunteer availability in different communities and cost. In general, the more volunteers the greater the coverage, but CBS is easy to scale up, so start small with 10-20 volunteers in one area, and scale up once the system is proving to work as expected.

Consider how the target community or village is organized before deciding on the number of volunteers. Determine what a realistic number of households a volunteer can cover, and how information is shared and disseminated within the community. For example, if the volunteer has to visit households to access trigger information, he or she would be able to cover fewer households than would be the case if community members had to actively seek out the volunteer to notify him or her of something unusual. The location of households within a community is another variable, as is transport and access to mobile phone or shortwave radio for communication (if households are located far away from one another).

It is important to ensure that measures are taken to avoid overlap and double alerts for the same trigger. Using pre-existing geographical or social boundaries may be the easiest way to avoid overlap. Each volunteer may be responsible for the reporting of cases that occur within his/her boundary, which may mean village or township, family, workplace and chiefdom, etc. Several volunteers report to the same CBS supervisor so a 'double or duplicate' alert may be identified by the supervisor but geographical location will help determine if this is a true duplicate report.

Can you answer the following questions?

- What are the community and family/household structures in place?
- Which geographical and social boundaries can help dividing areas of responsibility among volunteers?
- How will community members have access to a volunteer?
- How can you ensure that there is no double reporting?
- How will you recruit volunteers?
- How, when and where will you train volunteers?

Training:

The level of training required by volunteers will depend on their previous knowledge and training, and the type of CBS being implemented. In addition, the CBS Cholera Training Manual can be used as a starting point for planning SMS-based project training. The RAMP Survey Toolkit Volume 3 has useful tips for any RAMP training, and sample agendas for an app-based survey training required for CBS verification and risk assessment.

Consider:

- Who is the most appropriate person to respond to and report on a certain disease or health event?
 - Would it be appropriate for men to report on maternal health issues?
 - Which community member is likely to hear about health events when they happen?
- Location of training: is there mobile signal/internet access in the area so that a test survey can be performed and results can be demonstrated during the training?

Annex 2

Examples of alert triggers

Example of unusual events and community case definitions

Unusual events:

- A cluster of deaths from an unknown cause in the same household or community.
- A cluster of sick people with an unknown illness in the same community.
- An unusual pattern of disease in the community.
- Any unusual event that raises concern, fear and alarm in the community.
- A cluster of cases of sickness due to an unknown cause.

Community case definitions:

- Measles: Fever with rash (needs to be adapted if Dengue is prevalent in the area).
- Cholera: Acute watery loose stools.
- Hepatitis A: Fever and the skin and the whites of the eyes turn yellow.
- Acute Respiratory Infection: Sudden illness, fever, cough and difficulty breathing.
- Acute Hemorrhagic Fever: Fever with bleeding from the nose, eyes or mouth (not due to an accident).
- Acute Jaundice Syndrome: Yellow eyes or skin with or without fever.
- Acute Bloody Diarrhoea: Loose stools with visible blood.

The Fundamental Principles of the International Red Cross and Red Crescent Movement

Humanity The International Red Cross and Red Crescent Movement, born of a desire to bring assistance without discrimination to the wounded on the battlefield, endeavours, in its international and national capacity, to prevent and alleviate human suffering wherever it may be found. Its purpose is to protect life and health and to ensure respect for the human being. It promotes mutual understanding, friendship, cooperation and lasting peace amongst all peoples.

Impartiality It makes no discrimination as to nationality, race, religious beliefs, class or political opinions. It endeavours to relieve the suffering of individuals, being guided solely by their needs, and to give priority to the most urgent cases of distress.

Neutrality In order to enjoy the confidence of all, the Movement may not take sides in hostilities or engage at any time in controversies of a political, racial, religious or ideological nature.

Independence The Movement is independent. The National Societies, while auxiliaries in the humanitarian services of their governments and subject to the laws of their respective countries, must always maintain their autonomy so that they may be able at all times to act in accordance with the principles of the Movement.

Voluntary service It is a voluntary relief movement not prompted in any manner by desire for gain.

Unity There can be only one Red Cross or Red Crescent Society in any one country. It must be open to all. It must carry on its humanitarian work throughout its territory.

Universality The International Red Cross and Red Crescent Movement, in which all societies have equal status and share equal responsibilities and duties in helping each other, is worldwide.

For more information on this IFRC publication, please contact:

In Geneva

Amanda McClelland

Public Health in Emergencies, Senior Officer
Community and Emergency Health Unit,
Health Department

amanda.mcclelland@ifrc.org

www.ifrc.org

Saving lives, changing minds.