Community indicator-based surveillance

Briefing paper for field epidemiologists
Concepts and practical aspects to help implementation of community indicator-based surveillance in humanitarian settings

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OBJECTIVE OF THIS DOCUMENT:

- To discuss the practical aspects of the design, implementation, and evaluation of community indicator-based surveillance (CIBS) in humanitarian settings.
- To provide a theoretical framework on public surveillance (definitions, types, and attributes) from the perspective of the CIBS in a humanitarian setting.

Our aim is help field teams to decide what the most appropriate system might be and to improve the design of CIBS systems within MSF operations.

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# 1. Abbreviations

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<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AJS</td>
<td>Acute jaundice syndrome</td>
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<tr>
<td>ANC</td>
<td>Antenatal care</td>
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<tr>
<td>AWD</td>
<td>Acute watery diarrhoea</td>
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<tr>
<td>CBS</td>
<td>Community-based surveillance</td>
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<td>CEBS</td>
<td>Community event-based surveillance</td>
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<td>CHW</td>
<td>Community health workers</td>
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<tr>
<td>CMR</td>
<td>Crude mortality rates</td>
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<tr>
<td>EPI</td>
<td>Expanded program of immunization</td>
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<tr>
<td>ePrep</td>
<td>Emergency preparedness</td>
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<tr>
<td>GIS</td>
<td>Geographic information system</td>
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<tr>
<td>GPS</td>
<td>Global position system</td>
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<tr>
<td>HES</td>
<td>Health education supervisors</td>
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<td>HF</td>
<td>Health facilities</td>
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<td>HPCE</td>
<td>Health promotion, communication and education</td>
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<tr>
<td>CIBS</td>
<td>Indicator-based community-based surveillance</td>
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<tr>
<td>IFRC</td>
<td>International Federation of Red Cross and Red Crescent Societies</td>
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<tr>
<td>IPD</td>
<td>Inpatient department</td>
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<tr>
<td>ITFC</td>
<td>Inpatient therapeutic feeding centre</td>
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<tr>
<td>MSF</td>
<td>Médecins Sans Frontières</td>
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<tr>
<td>MUAC</td>
<td>Middle-upper arm circumference</td>
</tr>
<tr>
<td>NGO</td>
<td>Non-governmental organization</td>
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<tr>
<td>OCA</td>
<td>Operational Centre Amsterdam</td>
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<tr>
<td>OPD</td>
<td>Outpatient department</td>
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<tr>
<td>SOP</td>
<td>Standard operating procedures</td>
</tr>
<tr>
<td>U5MR</td>
<td>Under five mortality rate</td>
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<td>UNHCR</td>
<td>United Nations Refugee Agency</td>
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2. Introduction

Health information data are crucial to inform Médecins Sans Frontières (MSF) activities in humanitarian settings. Adequate systems to collect and analyse these data will allow us to better plan our resources, prioritise activities, and monitor and evaluate the impact of our interventions.

Public health surveillance is commonly used to obtain health information data. In most settings, public health surveillance relies on information collected by healthcare facilities where patients come to seek treatment. Facility-based surveillance is sometimes complemented by laboratory surveillance. In most MSF interventions, we collect data in our health facilities (HF) and sometimes in our laboratories. This approach is limited in its ability to detect public health events and the occurrence of disease in populations that cannot access care at health facilities (i.e., they experience barriers to access care). Unfortunately, this is the case in most contexts where MSF works, where access to healthcare is far from universal.

Engaging community members to collect health information from within their communities and report it for public health surveillance purposes can be a useful approach to address the above-mentioned challenges, but also to engage with communities in a more meaningful way. This approach is conventionally termed "community-based surveillance" (CBS). In MSF contexts, CBS is usually performed by community health workers (CHWs) who visit households to collect information on health events occurring in those households in a given unit of time (e.g., number of deaths or sick people in the household in the previous week). This type of CBS is called indicator-based CBS (CIBS).

In this document, we first present key surveillance concepts from the perspective of CIBS in MSF contexts to provide a more contextualised theoretical framework. In this way, we set the foundations to discuss the practical aspects of CIBS implementation in such contexts. This document has been developed taking into account previous MSF experience and existing guidelines.

The objectives of this document are:

- To discuss the practical aspects of the design, implementation, and evaluation of community indicator-based surveillance (CIBS) in humanitarian settings.
- To provide a theoretical framework on public surveillance (definitions, types, and attributes) from the perspective of the CIBS in a humanitarian setting.

Our aim is to help field teams to decide what the most appropriate system might be and to improve the design CIBS systems within MSF operations.
Community indicator-based surveillance: briefing paper for field epidemiologists

Cholera intervention Mbuji Mayi © Giorgia Girometti/MSF
3. Concepts on Public Health Surveillance

This section outlines some of the commonly used definitions for terms related to surveillance in MSF and in public health in general.

3.1. Definition of surveillance

The systematic process of collection, transmission, analysis, and feedback of public health data for decision-making (information for action). This is one of the multiple definitions that can be found in literature.

3.2. Community-based surveillance, health facility-based surveillance, or laboratory-based surveillance.

3.2.1. Community-based surveillance (CBS)

The systematic detection and reporting of events of public health significance within a community, by community members and for the community.

It is usually not very specific but is very sensitive. Timeliness is usually good in CBS, as diseases can be identified as soon as they occur in the community (see annex 1: surveillance attributes, for more details on sensitivity).

Community-based surveillance will normally use community case definitions, used by community members, which are typically simpler than the case definitions used in health facilities (HF).

3.2.2. Health facility-based surveillance

Health facility-based surveillance collects information from health facilities (HF) using case definitions adapted to health professional’s knowledge and the diagnostic capacity available (e.g. laboratory tests, X-ray). HF-based surveillance is not CBS and is not always easily comparable to CBS, as it may use different case definitions and receives a different type of patients (i.e. patients who can access medical care vs those in the community who cannot access facilities because they are not severe enough, experience barriers to access care, or choose to seek alternative or traditional healthcare). Furthermore, in most MSF contexts, it is not possible to capture mortality indicators through HF-based surveillance, as many deaths will occur in the community and not in the HF.

HF surveillance can complement the CBS by covering other locations, or by helping to cross check and validate the data provided by the CBS (e.g. mortality data triangulation, capture-recapture, investigation/validation of increases in number of cases of a certain disease).

If the HF has a good coverage, and most people have access and go to the clinics, we may not need to use CBS as the HF may generate enough data for our objectives (e.g. morbidity for early outbreak detection or health deterioration in population).

HF-based surveillance is more specific and less sensitive than CBS. However, timeliness can be worse as outbreaks sometimes occur in the community for a while before the HF receives cases, thus HF-based surveillance may detect outbreaks late (see annex 1: surveillance attributes, for more details on sensitivity, specificity and timeliness).
3.2.3. **Laboratory-based surveillance**

Laboratory-based surveillance uses laboratory testing results. It will often be very limited, or non-existent at the CBS level (although in some areas where MSF works, CHWs use malaria rapid diagnostic tests). Laboratory facilities can also be used for confirmation of cases (of disease) detected by CBS.

This surveillance is even more specific than HF-based surveillance, but also less sensitive (and obviously much less sensitive than CBS). The range of diseases covered by laboratory-based surveillance will also be limited by the types of tests available in the area. Timeliness can also be worse in laboratory-based surveillance in comparison with HF-based surveillance, as test results may take some time to arrive.

3.3. **Indicator-based vs. event-based surveillance**

Community-based surveillance can be classified as either CIBS or community event-based surveillance (CEBS).

3.3.1. **Indicator-based surveillance**

This is defined as the systematic collection, monitoring, analysis, and interpretation of structured data. Other types of surveillance can use “non-structured data” (see below event-based surveillance).

The data is collected in defined intervals from defined data providers (clinics, laboratories, CHWs etc). Structured data are then processed to calculate a specific set of indicators that can be followed over time (i.e. trend analysis). This type of data is usually based on case definitions that explain what type of information should be collected (e.g. cases with fever) and it can usually be counted (e.g. number of cases with fever per months identified by CIBS) and compared over time.

The source of the structured data is usually from HFs, but the community can also provide structured data, in which case we talk about community indicator-based surveillance (CIBS). CIBS is the focus of this document and all sections have been written to orientate CIBS.

3.3.2. **Event-based surveillance**

This is defined as the organised collection, monitoring, assessment, and interpretation of mainly unstructured, ad hoc information regarding public health events or risks.

This information is diverse in nature and originates from multiple, often not-predetermined sources both official and unofficial, including rumours reported by the media or ad hoc reports from informal networks (including community-based networks).

EBS does not use case definitions but can use event definitions. Such event definitions can include, for example, a cluster of illness in the same family. CHWs will not report the individual cases of a defined disease, but unusual events that usually involve more than one case. This type of information usually cannot simply be counted to observe trends (no point in displaying a trend of clusters of illness in the same family, as those can represent many different diseases) but each notified event needs a verification and assessment.

As mentioned above, the main purpose of this document is to help design and implement CIBS systems. Further guidance on EBS can be sought from MSF Epidemiology Advisors.

3.4. **Passive vs. active surveillance**

3.4.1. **Passive surveillance**

This approach to surveillance relies on data providers (e.g. community health workers, clinics, physicians, laboratory or hospital staff) to take the initiative to report data.
An event-based surveillance system could be considered as a passive system, if we expect CHWs or community key informants to call us if something unusual happens, as opposed to staff working in surveillance actively seeking the data.

In some cases, passive data collection (e.g. passive EBS) might be easier and cheaper but may not provide detailed indicators for monitoring trends. Furthermore, a passive EBS system can also demand important resources for alert filtering and validation.

### 3.4.2. Active surveillance

This approach to surveillance relies on the public health officials’ initiative to actively approach their data providers for surveillance information, e.g. pick up the phone and call or drive to the place where the data providers are. In an active surveillance system, reporting units (e.g. CHWs) are expected to report zero cases or “nil” when there are no events to report.

In MSF, we use this active surveillance approach in CIBS as CHWs actively seek data from households within the community while MSF surveillance staff actively seek data from those CHWs at the same time.

Active surveillance is normally more costly and resource intensive but can be timelier and more sensitive.

### 3.5. Exhaustive vs sentinel surveillance

#### 3.5.1. Exhaustive Surveillance

Exhaustive surveillance systems aim to cover the whole population in the geographical area (local, regional, or national).

In an exhaustive CIBS in a camp for displaced people, or in an area of intervention, MSF covers everyone living in that location. This is a common approach in settings where MSF covers a whole camp (or a few camps or camp areas) where people are concentrated (i.e. closed settings). Exhaustive CIBS may be much harder in open settings, when we cover many different locations (e.g. many villages in a rural area), which are not close to each other.

Exhaustive CIBS is generally very resource intensive, especially in open settings.

#### 3.5.2. Sentinel Surveillance

Sentinel systems rely on notifications from a selected set of data providers. For instance, a sentinel CIBS system would only cover some of the villages in a defined area, or only some areas of a city or camp.

The main objective of the sentinel surveillance is to allow us to understand trends of diseases. This is extremely useful for diseases or events that are present all the time (e.g. malnutrition or cholera in endemic areas) so we can better assess if there are real increases or decreases, as we can accurately monitor the trends. This type of system can also be very useful for the evaluation of an intervention (i.e. changes in the disease trend related to the intervention).

The advantage of sentinel CIBS is that they usually require fewer resources than exhaustive CIBS. The disadvantage is that we cannot cover the whole area and may miss some signals. Therefore, timeliness and sensitivity may be compromised as alerts may be delayed or not even detected.

The representativeness and coverage of the sentinel surveillance will be crucial (geographical coverage, places of transit, percentage of total estimated population covered, population group, disease prevalence, etc.). See annex 1: surveillance attributes, for more details on coverage and representativeness.
3.6. Enhanced surveillance

This is a more intensive surveillance in response to a special event or an alert. There will be additional indicators collected (e.g. new diseases) or additional information collected for each case of a disease already under surveillance.

For example, if CIBS is already established in a given setting to collect only mortality data, if an outbreak occurs, the already established CIBS system can be enhanced by adding the outbreak disease to the data collection. In that case the CHW will not only ask for deaths but also for cases of the outbreak disease.

Enhanced surveillance with additional information on individual cases is sometimes put in place for new diseases of unknown origin (pathogen) or low frequency/high-risk diseases. In these cases, we may aim to collect risk factors and detailed clinical information to better describe the outbreak, in order to identify the source and patterns of transmission, and to propose adequate public health actions. For example, in some settings we established enhanced surveillance for acute jaundice syndrome where we could not identify the pathogen causing the outbreak.
4. Implementing CIBS: Objectives and Indicators

4.1. Why do we implement CIBS?

We often set up an CIBS system during an emergency response because we need information about the health situation of the community in order to prioritise our activities properly. This is often the case in displacement emergencies where we do not know (from the information we are able to collect at the HFs) what the health status of the population is, what the main diseases are, etc.

CIBS is also crucial in outbreaks, as it helps to actively identify potential cases of the disease and refer them for appropriate clinical management, while understanding the extension and severity of the outbreak and establishing a surveillance system to monitor its evolution. This is extremely useful to inform risk assessments (i.e. likely impact, size, duration, etc.) and in the prioritisation of different geographical areas and/or activities.

At times, we also implement CIBS in areas where we have been working for some time, and where we want to have a system that can identify outbreaks or other health emergencies early, so we can quickly respond and reduce morbidity and mortality.

In all of the above scenarios, as in any MSF project activity, we need to consider what existing health services and surveillance systems are in place, and what are the community perceptions of this. We also need to critically evaluate our constant need for more information, given the competing priorities for human and financial resources during an emergency response. Taking all these factors into consideration, it is crucial to understand what and where the gaps are, how we can complement existing systems, and what will happen once we leave (see exit strategy section below).

4.2. What is CIBS in the practice?

In an MSF intervention, CIBS is (usually) when CHWs go household by household, asking questions about health status (e.g. diseases, mortality and population movement), write down numbers (i.e. count the events) and report those back so they can be collated and analysed.

4.3. Ethical considerations for CIBS

There is no clear existing guidance on the ethical issues and considerations around the implementation of CIBS within MSF. These systems are often considered routine data collection for monitoring and, under that assumption, not considered to require further ethical approval for data collection. In any case, it is critical that in communities where CIBS is implemented, the population is informed about the objective of the data collection and how that data will be managed (i.e. anonymised, with confidentiality, and within secured and protected data systems). These aspects should be explained during all household visits (or at least during the first visits) so that informed consent can be obtained. All households should be informed that they are free to refuse participation without penalty, and that no incentives or inducements will be provided to any respondent. Data collection should never be done with minors without the authorisation of an adult who can provide consent on behalf of that child (e.g. when collecting middle upper-arm circumference – MUAC – information). The local laws and social customs should also be respected (e.g. the head of the household should provide authorisation).
4.4. Socio-cultural considerations for CIBS

As in any other health activity implemented by MSF, in-depth understanding of community perceptions and their preferences are crucial for the planning of CIBS. This is even more important in CBS as this surveillance is conducted within the community, by the community and for the community. A community approach based on community consultation and co-design should be used as much as possible. Further advice on this can be sought from the MSF social research team.

Additionally, understanding the local social fabric and identifying and engaging with community members providing healthcare, can be a powerful source of information to complement the CIBS. For example, in one MSF project, the CIBS identified an apparent increase in acute jaundice syndrome (AJS) cases, but the team was not sure if this was a surveillance artefact (i.e. more cases were being found because they had been training on AJS identification for the CHWs as a response to the apparent increase in AJS). The traditional healers were key in the outbreak confirmation as they were used to AJS, and they verified that the increase in cases was abnormal and substantial.

4.5. CIBS objectives

This is probably the most important part of CIBS. Objectives should be set with the rest of the team and following advice from the project’s Epidemiology Advisor. It is crucial to engage and consult the community in the design of an CIBS. Further advice on community consultation can be sought from the MSF-OCA social research team.

The objectives of the CIBS should be defined while keeping in mind how the CIBS will contribute to MSF’s priorities and interventions. Project log frames should include surveillance objectives or activities if these are considered necessary.

Objectives should be clearly stated at the start of CIBS implementation, making clear what is the final goal of our objectives. These objectives should always be discussed and reflected upon with the team and might change over time (leading to changes in CIBS format/implemention).

Some examples of possible objectives to include in CIBS:

- To identify unusual changes in disease incidence trends in order to allow a rapid investigation or response.
- To guarantee an effective and rapid case finding and referral of (suspected) X disease cases in order to facilitate early access to care.
- To monitor changes in morbidity and mortality at the community level in order to assess the impact of intervention X.
- To provide an accurate trend of mortality rate and/or malnutrition prevalence and/or outbreak prone disease incidence, etc. in order to quickly identify deteriorations in the situation that may require a response.
- To determine changes in the coverage of public health interventions (vaccination, mosquito net ownership, access to safe water, access to latrines, access to healthcare) for the target population.
- To provide accurate total population figures and to calculate the burden of disease X in the community in order to inform resource allocation.

4.6. Information and indicators to be collected

Information and indicators to be collected will depend on the objectives and will be linked to the project objectives (project log frame) or the Emergency Preparedness plan (EPrep). The most common types of information collected in CIBS systems are mortality, births, diseases including malnutrition, coverage of some activities (e.g. vaccine coverage or ante/postnatal care coverage), population numbers and population movement.

The adequacy of the CIBS will depend on the choice of the system objective and the subsequent indicators collected to achieve those objectives.
We always need to ask ourselves:

- Do we really need an CIBS? Are we able to obtain data in any other way that doesn’t require the implementation of a community-based surveillance system? For example, do we need data from CBS to monitor morbidity trends? Are our outpatient department (OPD) data not good enough? (i.e. is the data capturing the health profile/need of the population of interest?). In some displacement camp settings, after the first phase of the emergency response and once the HF’s are functional and reporting properly, if the majority of the population is accessing these clinics, we may not need an CIBS to capture information on morbidity. On the other hand, if we are interested in mortality data, the HF's will be unlikely to capture this information.

- Will we be able to respond to the data generated from the system? If we are collecting data, but then are unable to respond (through lobbying, advocacy or direct intervention), then data should not be collected for ethical reasons. For example, it might not be ethical to collect information on malnutrition if the project has clearly stated that under no circumstances we would do a malnutrition intervention, and we will not share our data with other actors.

- Will the population accept that we collect the indicators we proposed, in the way we proposed? For example, in certain settings death is a very sensitive topic that should be approached with delicacy, or certain diseases could be associated with witchcraft. As mentioned above, the social and cultural context where the CIBS will take place should be taken into account.

CIBS should be as simple as possible. For every indicator we aim to collect, there should be a clear justification, i.e. what we will do with that indicator. When designing an CIBS, there is usually a tendency to over-collect and under-analyse information. One should always critically think about what information to collect (considering the scarce resources available), and make sure the CIBS system only collects data that are actionable/will be used to inform public health decision-making.

Some examples of common indicators collected via CIBS:

### 4.6.1. Demography and population estimates

Obtaining accurate population figures should always be considered a priority in any intervention (especially if we do not have any other reliable data, which will often be the case).

There are different approaches for getting population estimations depending on the context and the resources available; CIBS is only one of many options. Rapid population estimates techniques, including the use of satellite imagery and geographic information system (GIS) data, can be used to estimate population figures. More information on rapid estimate techniques can be found in the MSF guide “Rapid population estimation in emergencies”.

CIBS can also be used to perform a head count or census to obtain population estimates. CHWs can go house-to-house and ask how many people currently live in the household. Once a baseline population figure is established, the CHWs can help to monitor population movement by asking each household about births, deaths, arrivals and departures, or by monitoring the whole community (asking how many families or individuals have arrived or left in the last time period). In rapidly changing contexts, we may need to combine both (e.g. weekly monitoring of arrivals and departures and a population census every two or three months) so that we can cross check figures to make sure our population movement monitoring system is working. Satellite imagery techniques might also be useful to cross check information in these cases.

### 4.6.2. Mortality

This indicator is one of the core components of any CIBS. CHWs will do house-to-house visits asking households about deaths. We need to specify a regular time interval between visits (normally one or two weeks), so we can get a person-time denominator to calculate crude mortality rates (CMR) and under five mortality rates (U5MR).
Indicators

The complexity of mortality indicators can vary:

- **Raw numbers of deaths without denominator:** a simple approach which does not require precise population estimates. We should always consider this as a minimum in CIBS. But raw numbers can be difficult to interpret if population numbers are rapidly changing (e.g. high influx of refugees).
- **Mortality rate (deaths/10,000 population/day):** this indicator requires a person/time denominator. It is more challenging to obtain, but it is feasible, and one of the most important indicators of the health status of a population in an emergency setting. Mortality rates require knowledge of the population size and the time frame in which the death happened. The analysis of CIBS mortality data is relatively straightforward and can be performed by anyone with a pencil. For example, if at the end of the week a home visitor reports four deaths in a sector of 1,540 people, the crude mortality rate (CMR) must be four people in 1,540 x 10,000 over seven days = 3.7 per 10,000 people per day. Weekly analysis should take place for surveillance in an emergency in order to observe trends in real-time and mount a rapid response. If small sub-populations, such as people living in camps, are under observation, some apparent weekly fluctuations may simply be a result of chance: in the above example, one death would yield a CMR less than one per 10,000 per day, whereas with two deaths the emergency threshold would be crossed. Similarly, if population estimates are updated upwards or downwards, mortality rates will appear to shift suddenly, while actual mortality may remain unchanged (more details on the mortality indicators can be found in the network paper by Checchi F. And Roberts L., see section on reference and further reading).
- **Age specific mortality:** we often consider under five mortality data. This is easy to obtain if we get population figures with that same age strata divisions.
- **Cause specific mortality data:** more complex, as it requires finding out the cause of death.
- **Maternal mortality:** depending on the programme, can also be considered.

Mortality indicators (or an approximation) can also be obtained in other ways: new graves counting (in some emergency contexts this can be a good way of getting a good and rapid estimate) or monitoring funerary items distribution. Obtaining this data will depend on the local culture. For example, in areas where shrouds are used to bury dead people, MSF could consider distributing them for deceased people, so we can monitor; in some areas younger children are not buried in cemeteries, so grave counting will not be useful to capture child mortality. As mentioned above, local culture must be taken into account when designing the CIBS system, and special attention should be paid to mortality as death is a sensitive topic in most contexts. For example, in a given context where MSF established cemetery surveillance to capture deaths, the MSF team was accused of being involved in black magic.

Verbal autopsies can also be used to identify in detail the probable cause of death. Verbal autopsies require well trained or highly qualified staff with clinical knowledge, so this is often not feasible within CIBS.

In some contexts, different sources can be very useful to triangulate and complement information (e.g. HF’s mortality data, grave count, undertaker interviews, etc.).

4.6.3. Morbidity

In CIBS, we usually focus on collecting information about outbreak-prone diseases, so we can refer cases for adequate treatment quickly, analyse trends, and identify increases or outbreaks early.

The choice of diseases will depend on the epidemiological context and what we are willing to respond to (i.e. what is on our EPrep and/or project logframe). The choice of disease will also depend on what we will likely see in the OPD and inpatient departments (IPD) and what we might miss there. For example, patients who only have “yellow eyes” (acute jaundice syndrome) can be identified in the community, and are unlikely to go to an HF, unless they experience a complication. In this scenario, CIBS can be a powerful complement to OPD/IPD surveillance because it can identify cases of acute jaundice syndrome that we would never see at the HF level. On the other hand, other diseases like meningitis cases, are more likely to actively seek healthcare at some point (if care is available and accessible).
We should always try to keep the number of diseases under surveillance as minimal as possible. Usually, CIBS will be limited to diseases with salient and visible signs and symptoms and/or already familiar to the population, so the system remains simple and feasible. See below section 4.5.1 on community case definitions.

Once we have trained the CHWs on data collection for the chosen disease, we can also add additional training (depending on the level of the CHWs and the duration of activities) on other diseases for which we are not currently collecting indicators. For example, during a measles outbreak in an area prone to cholera outbreaks and with high prevalence of malnutrition, we may design a CIBS to collect indicators on measles, malnutrition and acute watery diarrhoea. Once the CHWs are trained and understand the case definitions for these three diseases, we can train them on the identification of other outbreak-prone diseases (e.g. meningitis or viral haemorrhagic fever).

In settings where healthcare is available and accessible, we may not need to collect indicators about morbidity from the CHWs. In these scenarios, we could consider a system in which the suspect cases are referred (or even accompanied by CHWs) to the HF, so that we can focus our data collection and analysis on that level. In these cases, we may need to monitor the number of referrals conducted compared to the number of patients who actually present at the HF (to make sure our assumption on people mostly accessing healthcare is true). See section on referrals below.

Some diseases we might consider covering are measles, acute watery diarrhoea (AWD), acute jaundice syndrome, malnutrition and haemorrhagic fever. Depending on the context, we can also consider maternal and reproductive health problems.

**Indicators**

- **Raw numbers:** a simple approach which does not require precise population counts for denominators. We should always consider this as a minimum in the cases where CIBS is needed. Similarly, to the raw numbers of deaths, raw number of disease will be difficult to interpret if population number are rapidly changing (e.g. high influx of refugees).
- **Incidence rate (normally calculated weekly):** Number of new cases of the disease (or health event of interest) divided by the total population (estimated for that time period, i.e. total population that week). It is a crucial indicator to closely monitor the outbreak (e.g. is it increasing or decreasing)
- **Cumulative attack rate (or cumulative incidence rate):** total number of cases (in the overall outbreak up to the time of the analysis) divided by the mid-term population at risk. This is a very important indicator to understand at what moment of the outbreak we may be and what may happen in the next weeks or months. E.g. We know that previous cholera outbreaks in the same area have had a cumulative attack rate of around 1.5%, we have already reached 1.6% in the current outbreak, and cases have been decreasing in the previous two weeks, therefore we could say that we are likely to have passed the peak and the down trend is likely to continue.

4.6.4. **Programme activities coverage and basic needs**

These indicators are related to MSF’s (or other health actors) activities coverage (e.g. the percentage of children vaccinated or percentage of pregnant women attending antenatal care (ANC) programmes), and basic needs coverage (e.g. percentage of people with access to safe water, number of litres of water available per person, non-food items per household, etc.).

This type of information can be very useful to inform MSF programmes, but may not need to be collected on a weekly basis; data collection every few weeks or every few months can be enough to inform activities. For example, an CIBS system could add information on vaccine coverage to the routine data collection for one week every two months. If we need to collect more indicators they can be alternated, e.g. the first week of the month we collect vaccine coverage data, and the third week of the month we collect data on ANC coverage. Depending on the context, this type of indicator may require specific ethical review/authorisation by local authorities and MSF boards.
Indicators

- Ratios: quantities of the above by a person or household or;
- Coverage (percentage): number of people with access or who accessed the item of interest (e.g. vaccine) divided by the overall population.

4.6.5. Age groups for indicators

For all the above indicators we may need to collect information stratified by age group (e.g. MUAC for children aged under five and pregnant and lactating women, or children versus adults). If the information about these events is collected by age group, we may also need to get population estimates stratified by the same age groups, in order to have the right denominator for the calculations. In some contexts, collecting information on the age of the children may be very complicated and we may need to use sticks with measures for cut-off: 67-87cm for children six months to two-years-old and 87-110cm for children two to five-years-old.

We need to consider simplicity, as adding additional age groups will complicate the data collection and analysis. We also need to reflect on whether these stratifications are needed.

4.7. Other activities related to CIBS activities

4.7.1. Referrals

In most CIBS, beyond the surveillance purposes, the identification of cases of certain diseases will be done as part of active case finding activities (to improve coverage of the case management activities and to increase early access to treatment in order to reduce morbidity and mortality at the community level). The CIBS CHWs can also be trained to help with referral pathways for events that are not covered by the CIBS (e.g. sexual violence, mental health or protection).

We may need to monitor the referrals to see if, once identified and directed to the clinic, the patients actually arrive at the clinic. For this purpose, we can use tickets in which the supervisor writes down basic information (e.g. age and referral reason), gives a copy to the patient (with the same information) and asks the patient or caretaker to produce this ticket at the clinic. The tickets can then be collected at the clinic and counted on a daily or weekly basis. This method would allow the assessment of the percentage of referrals that meet the case definition and the percentage that are actually reaching the clinic.

If there is a good referral system to an MSF facility, where patients will definitely arrive and be counted at OPD or IPD level, we may not need to count cases at the community level. The case definitions will be more specific at OPD and IPD level and therefore more reliable, assuming that we are not compromising on sensitivity (i.e. all the cases referred by the CBS would arrive at the clinic and be assessed).

However, this may be complicated if there are other non-MSF referral HFs in the area or if MSF does not have a permanent clinic. We need to always be aware of the ethical implications of identifying patients, particularly severe cases, when there is no way for them to be referred. MSF should not be sending CHWs to find disease cases in communities if we cannot provide any treatment for them. Nonetheless, in most MSF projects there will always be different options for referral pathways. For example, for some diseases we could organise an ambulance system, or if transport is available but patients cannot afford it, we could pay for the transport. Ideally, we would explore community support approaches (e.g. the community leaders could create a community health support funding pot to be used for transfers).
4.7.2. Health promotion and health programme activities

CHWs working in CIBS are often involved in other activities. They also perform health promotion/education activities, follow up defaulters from health programmes (e.g. vaccination or malnutrition programmes) and sometimes even test and treat patients for certain diseases within integrated community case management (iCCM) activities. These activities are essential for our programmes, but we need to be aware that these are not technically surveillance activities, even if they are done by the same CHWs. Furthermore, it is important to consider that if the CHWs are overloaded with many different activities (e.g. surveillance, health promotion, social mobilisation, etc.) the quality of their activities could be compromised.
5. Implementing CBS: Practical Aspects

5.1. Recruitment

CBS consists of engaging community members to collect health information. Therefore, CHWs performing CBS activities are also members of the community under surveillance. Furthermore, when recruiting CHWs we need to select people who are as representative as possible of the target population: they are from the same tribe, speak the same language, of different age ranges genders, etc. (e.g. having women will be especially important if we are collecting reproductive health related information). We should always consider existing CBS structures and reflect on whether we need to recruit additional CHWs (for example, we may be able to work through CHWs that are already working in the area).

We will obviously benefit from people who are educated and can speak (and read) the MSF working language in the area (English, French, Arabic, etc.), but we need to be aware that in some cases it may be more important to have people who belong to the same target population and are well accepted by their community. At times, we may need to work with people who cannot read or write (as long as they can count).

We should always try to discuss the recruiting strategies with the different community leaders (especially the target population community leaders), and these will obviously vary depending on the specific context. For example, in some contexts, CHWs who are very young may not be accepted for mortality surveillance as death is sometimes considered a topic only to be discussed by older people.

Some examples for job profiles or job descriptions used in some contexts can be found in Annex 3.

5.2. Training

CHWs may need at least one day of training for population counting and two days for morbidities surveillance. These training sessions should always be as simple as possible, and we should try to avoid overloading CHWs with too much information. Refresher training and on-the-job training/coaching should be considered. These trainings should always include piloting interviews/household visits in the community.

Some suggestions on areas to cover during the training are:

- How to represent MSF and what MSF stands for.
- How to introduce themselves to the population. In some contexts, it could be helpful to choose CHWs that already have a position within their community (e.g. teachers, religious leaders, community activities, etc.)
- Definitions on household (see section 4.5.2 on household definition), and diseases (adapted for CHWs education level and local understanding, and explaining how these may be different from case definitions at the HF level, etc. See Annex 2).
- Role plays on the possible scenarios the CHWs might encounter: e.g. no male head of the household, or head of household who doesn’t want to cooperate, or head of household who feels uncomfortable to talk about certain events, or what do when a household is empty, etc.
- How to complete data collection sheets.
- How to explain why MSF is doing surveillance, how their data will be used and how they will benefit from this.
- How to obtain informed consent.
The complexity of the data collected will have to be adapted to the capacity of the CHWs, which will depend on aspects such as literacy (able to write and read); previous experience/knowledge in health-related activities; etc.

Case definitions should normally remain very simple in a CBS (see section 4.5.1 on community case definitions).

5.3. Teams organisation

Ideally, CHWs should work in teams of two, and depending on the CIBS objectives, we may want to balance them by gender (one male, one female), level of education, tribal ethnicity, etc.

We will also need to divide the area (camp, village, etc) very clearly, using landmarks (see section 4.4 below) and designate an area for each CHW team of two to cover.

We need to decide which ratio of CHW to people is needed. We normally use a rule of thumb of a minimum ratio of one CHW to 500 people (or around 100 households, depending on the context). But we do not have evidence on the implications of using higher or lower ratios. For this reason, the use of different ratios CHW/people should be well documented so that we can learn and suggest more adequate strategies in the future. The ratio will depend on how heavy the surveillance system is. For example, if the CHWs collect data on deaths only (without further health promotion activities) the number of households per CHW can be higher than in a scenario where CHWs collect data on five diseases, mortality, births, population movement and also have to educate on hand hygiene at the same time. In this case, the number of households per CHW should be smaller. On the other hand, if CHWs have to cover very big areas with a sparsely distributed population (i.e. they need to walk long distances) we may need more CHWs per household. We can consider conducting a supervised test run to calculate how long the CHWs will need per household or sector. CHWs will normally get faster over time, as they get more comfortable with data collection.

In large scale CIBS with many CHWs, we will need focal points or supervisors for each village or camp zone (e.g. one supervisor or focal point for around 10-15 CHWs) so the data flow and communication are streamlined.

For all of the above, we also need to consider what other activities the CHWs are expected to do (see section 3.6, other activities related to CBS).

5.4. Mapping and household numbering

As in any other epidemiological activity, the “place” component will be essential in CIBS. Furthermore, mapping will be very important for the organisation of the teams. Proper mapping will allow us to clearly establish what the boundaries of each CHW team are. You can use a reference point and draw a map of the camp or village yourself (on a piece of paper), or you can walk around and try to create it using a GPS to get a polygon and landmarks (GIS colleagues can help). In some contexts, there may be maps available from other actors (e.g. UNHCR in camps). Whatever method we use to obtain a map, we will need to include as many landmarks as necessary, so the CHWs have enough references for the limits of the areas they are covering. We also need to make sure that these maps are available and clear for whoever comes to supervise the CIBS after (explaining the different areas of responsibility and which CHW team they fall under).

In some contexts where the CIBS has enough resources allocated, numbering the households can be very useful as the CIBS will be able to monitor the different indicators more precisely, and it will also facilitate other activities, e.g. the referral of sick patients or targeted prevention and health promotion activities. We must also be aware of the ethical implications of numbering the households, as we are making people much more identifiable, i.e. the information becomes less anonymous. As for any other surveillance activity, the heads of households should be informed about this and they must consent before we try to collect the information.
5.5. Definitions

As in any epidemiological activity, definitions are a key component of CIBS. We should choose the most appropriate definitions; agree and communicate them with all the actors involved, and make sure that everyone is using them properly.

5.5.1. Community case definitions

Community case definitions are two or three easily identified symptoms associated with a specific disease. It is simple and understood by trained CHWs who know what symptoms to look for. It is a more basic form of syndromic (symptom) reporting that is used by health professionals (with clinical knowledge and testing capacity) in national and other disease surveillance systems.

For example, trying to use the ‘3-Cs’ (coryza, cough and conjunctivitis) for measles may be very ambitious and we may want to stick to a simpler definition (i.e. rash and fever) for CIBS in a measles outbreak setting. We also need to be aware that if we use different case definitions, the resulting indicators will be different. A list of key simplified signs and symptoms for case definitions for use at community level is provided in annex 1, community case definitions. Community case definitions are a crucial part of any surveillance system, and they should be discussed with the Epidemiology Advisor.

It is important to double check that the translation of the case definitions into the local language uses local terms (which are well understood by the community) and respect the original community case definitions suggested. Back translation is a useful tool to verify that the translation is correct. To be sure, ask someone who speaks the local language to translate the case definition into the local language, then take this local language definition and ask someone else (who also speaks the local language and was not part of the previous conversation with the first translator) to translate it back (to English or French), and finally double check that it is correct.

In some settings the CIBS teams used pictograms in the data collection forms to represent the different diseases.

5.5.2. Household definition

Although the household definition might seem straightforward, it may not be obvious during its implementation. We need to carefully consider the best definitions possible for the given context and for the objectives of the system, while also adapted to the cultural context. For example, we often use the household average size as a proxy to get population estimates, as we may only have data on number of households. In rapid assessments, we may try to get an estimate of the population size by asking the number of households in the village and applying the average household size to that number. In these cases, we may need to consider using the exact same household definition that other actors or stakeholders are using, so that we can keep using the household number to approximate the total population estimates.

Some examples of household definitions and reflections:

- People who slept under the same roof the night before. This is very simple and useful, but the problem may come in situations where more than one family or household share the same house or tent. Or in situations in which many households live together but children may be in a hut, women in another hut, etc. This may be problematic when trying to obtain the average household size.
- People who eat from the same pot. This is very useful in most situations, but it may be challenging in areas where people have been displaced recently, and they do not have cooking items, or they do not have any food to cook.
- People under the responsibility of one head of household. This is very simple and useful in most settings, but if extensive families live together or if the family structure has been affected by an intense crisis, this may be confusing and lead to double counting.
We may also consider prioritising estimates for physical units/structures (e.g. huts), without taking into account the family or household structure. For example, in some areas where MSF has only just arrived, we may want to estimate population figures by counting structures (from the ground, from a hill, or by satellite imagery). In these cases, we may want to consider only the physical structures as reference, so with a structure and average size, we would be able to obtain a rapid population estimate by counting roofs or structures (e.g. huts).

5.5.3. The time unit (or recall period) in the household definition

For simplicity reasons, we normally use the previous night or the previous week as the time unit to consider when asking about health events. For example, when we perform head counts or census on a weekly basis to obtain a denominator, we ask how many people slept under that household roof the previous night. But we have to take into account that this may underestimate the population, and overestimate certain indicators, as we will be taking a one day cross-sectional population for a weekly estimate (we will not be counting the people who may have been around the other six nights, but we may count the sick ones as they are more likely to be present). This may have a serious impact on estimates. Underestimating denominators can lead to big errors in calculating the resources needed (i.e. underestimation of resources), and to overestimate rates or incidences of disease. Ideally, when using weekly indicators (e.g. weekly incidence or mortality) we should consider people who have been in the house for four days or more as an approximation to the mid-period population, but this is often simplified to those who were there the previous night.

When asking about health events, e.g. deaths or cases of a certain disease, we should normally use the same epidemiological week that other actors (including MSF facilities) use in their reporting system, so data can be easily triangulated. For example, if the epidemiological week in MSF HFs is from Monday to Sunday, we should also use Monday to Sunday as the epidemiological week in our CIBS.

5.5.4. The absent or non-respondent household and the empty house

All households meeting the agreed household definition should be visited in order to reduce, as much as possible, the number of non-responding households. We also need to clarify when a house will be considered as empty. If we go to a house and no one is there, we can ask the neighbours or people around if anyone slept there the previous night. If they say “yes”, we should try to go back and interview/collect data at least two more times. If we still cannot find anyone, then we can consider this as an absent or non-respondent household. If they say “no” (as in no one has slept there the previous night or previous week) we consider this as an empty house and we keep going (i.e. it will not be considered as non-responding, it can be ignored).

It is always advisable, where possible, to ask the teams to record information about non-response circumstances, at least during the first weeks or months of the system. Depending on the context and the time, the information should be well differentiated:

- Empty structures: if we have a lot of empty structures, this can be confusing when using some specific types of population estimates such as satellite imagery, and we should be aware of those limitations.
- Non-respondent-absent household (i.e. empty houses where someone is around but the team has not found them yet): this information may allow us to better define what times the team should be working, to identify if there is any issue with quality of the CHWs, or with the acceptance of CIBS activities by the community.
- Non-respondent-refusing household (i.e. households that refuse to participate): ideally, we would like to obtain information on the reasons for refusal. This information will help us to better understand the community perception of CIBS.
5.6. Forms (data collection tools)

It should be clear which forms we are using, and there should be a well-defined folder in which only the forms in use are filed. The CIBS focal point will be responsible for updating the files (if updates or changes are needed), but changes should be avoided to guarantee stability (see annex 1, attributes to see more details on stability). Mobile data collection (e.g. tablets or smartphones) and electronic questionnaires can be very helpful to reduce errors, the burden of data encoding, and to improve data flow and analysis timeliness. The Epidemiology Advisor and eHealth Advisor can provide further support.

We should use as few forms as possible, and when developing them we should always consult with key MSF staff in the mission/project and with the Epidemiology Advisor. They may have an idea of other forms and databases previously used or already designed, so we do not have to reinvent the wheel. Some examples of forms used in CIBS can be found in annex 4, but it is advisable to consult your line managers and the Epidemiology Advisor when designing them.

5.7. Data Flow

We will need to clearly identify the people responsible for each data collection activity, and clearly establish the quality checks they need to do, the timing of those reports, and the data analysis. This clarity will allow us to assess timeliness, completeness and data accuracy/quality.

For some pieces of information, we may need different frequencies. For example: weekly for all diseases, deaths, and population movements; monthly for MUAC; and quarterly or biannually for headcount or census (just to make sure that the population movement monitoring system i.e. people arriving and people leaving is working well).

An example of a well-planned data flow could be:

- CHWs collect information in paper forms weekly from Monday to Friday.
- On Friday evening (latest 5pm) CHWs give all forms to the village focal point, who will check that reports are complete and that there is no emergency event (that needs to be immediately reported).
- On Monday morning (latest 3pm), the village CHW focal point gives forms (reports from previous week) to MSF outreach camp or zone supervisor. MSF outreach camp or zone supervisor check that reports are complete and that there is no emergency event.
- MSF outreach camp or zone supervisor gives data to data encoder on Tuesday morning (9.30am latest).
- Data encoder enters all the data from the forms into the electronic data base by Tuesday at 2pm (latest).
- Analysis of trends and alert identification is done by epidemiologist and/or outreach supervisor on Tuesday at 5pm.

We need to be realistic in terms of the timeliness with which each step in the data flow process occurs. For example, it may not be possible to collect all information in a remote area (too far for CHWs to walk from) and with no phone network in a very short time. In these cases, we can establish a simplified system in which the supervisor visits a village or group of villages each week to collect all the data (paper forms) for the previous week. We may need to wait for a few more days until all the data is collected and analysed. For this approach, we should always establish a system for unusual or urgent events or clusters of events to be immediately reported. For example, we can try to ensure that the village CHW focal point has a phone and the capacity to walk or get transport to an area with a network, so they can inform when there’s an emergency. But we do not need to do that for every report: other numbers, within what’s expected, can be reported and analysed with a slight delay, while still being useful for analysing trends.
5.8. Data entry and database architecture

We need to carefully consider which tools (databases, dashboards, etc.) we will be using for data collection and data entry. We should always take into account simplicity so that whichever tools we decide to use can be maintained by colleagues with only basic data management skills.

Centralisation and aggregation: when designing the database, we also need to consider the capacity to automatically aggregate the data from different sites into one central database. We have some excel-based MSF-OCA tools for outreach activities (including CIBS) and some components of CBS will be integrated into the new health information system. Both allow for basic automatic analysis and easy trend monitoring. It is strongly recommended to consult with the Epidemiology Advisor before creating any new data collection tool.

In some areas, we may be able to use electronic mobile data collection systems and a web-based dashboard for automated analysis, although this is not common in CIBS in most of the contexts we work in. We can also consider an interface-mediated data entry, for example using Epi Data entry (or similar software) to reduce data entry errors.

5.9. Data analysis and report

We will need to analyse and interpret the data to provide recommendations, so the surveillance system can satisfy its ultimate objective to provide information for action.

As explained before, we need to consider the timing of these analyses. If our system is designed for the early detection of alerts (e.g. increasing trend of new cases of measles) the analysis should happen as quickly as possible. Other analyses for assessing the impact of an intervention (by looking at changes in indicators after the intervention) or the quality of our data, could potentially wait longer.

The results and interpretation of the analysis should be presented in a concise weekly or monthly CIBS report, and if trends are analysed, they can also be presented. Maps should also be produced and added to the reports. The information contained in these outputs or reports should be agreed with the team members who will be using it.

When interpreting the results, we should always try to identify the reasons for changes in trends or alerts, and make sure that there are no problems with the quality of the data obtained, or that there are no surveillance artefacts happening (e.g. a training to reinforce knowledge on the case definition of disease X could provoke an increase in cases of X reported by the CIBS, as the CHW become more aware of this disease and report more).

We also need to take into account the bias induced by the surveillance and referral itself. For example, if we were doing malnutrition surveillance in sentinel sites, we would need to be aware that those sites would not be as representative of the total catchment area over time, as we would be referring the severely acute malnourished children, and perhaps also doing some other health promotion activities.

The analysis and interpretation of these data should be done together or taking into account the information provided by other data sources and general context information. For example, if there is an increase in the number of suspected measles cases in our CIBS, we should look at our HF routine data collection systems and try to see if the increase is also reflected there.

5.10. Thresholds

An ‘alert threshold’ or ‘epidemic threshold’) indicates the level of incidence above which a disease requires an urgent response. It is key to well define what activities the threshold should trigger. For example, the threshold will trigger an investigation to confirm the alert, or it will trigger a direct response. In CIBS, we would normally need some confirmation or validation of the alert before the response is launched, by healthcare worker clinical verification or by a laboratory test. Verification and/or validation mechanisms should be clearly defined.
Each disease will have a specific threshold that will depend on:

1. The disease itself including infectiousness, determinants of transmission, case fatality rates, etc. For example, a case of Ebola will be more concerning than a case of flu.

2. The local context and whether a disease is endemic to the area; what is the expected population immunity for this disease; what is the baseline of weekly cases; and whether there is a known seasonal pattern. For example, a single case of cholera or a case of measles in a (supposedly) naïve population will be much more worrying than a case of these same diseases in an endemic area. The type of setting will also be crucial in this regard. If it is a close setting (e.g. refugee camp) or very densely populated area (e.g. urban slum) the risk of outbreak may be much higher.

3. The resources available for the response. In CIBS we will need to carefully consider a threshold, if we are covering a vast area, as we may not be able to investigate and much less to respond to every alert. This will be linked to the balance of sensitivity vs specificity. A document containing epidemic thresholds of infectious diseases with epidemic potential can be found in the MSF-OCA outbreak management toolkit. It is important to note that this document contains typical thresholds used by “normal” surveillance systems (i.e. HF-based surveillance) so those thresholds may need to be adapted to CIBS in the specific context. The document also includes case definitions that are the ones normally used at the HF level. The CIBS will normally require simpler case definitions (see annex 2, community case definitions for more details).

5.11. Monitoring and evaluating the system

When planning an CIBS, we should also consider the monitoring and evaluation of that system. The primary difference between monitoring and evaluation is that while monitoring is a continuous activity performed regularly during the implementation of CIBS, evaluation is a periodic activity, performed less frequently and often at the end of the emergency.

We should try to identify the key performance indicators to monitor if the system is working adequately. The planning of the monitoring activities, when the whole system is being designed, will help the development of tools that will allow capturing the key performance indicators. For example, if we install a registry for all the relevant information about every alert we receive (e.g. date of onset of first symptoms, date of report, date of investigation, date of action taken, etc.) we may be able to assess the timeliness or even the sensitivity of our system.

Similarly, appropriate reflections on the different attributes of a surveillance system on the design phase can help to establish which information can be collected for future evaluations (see annex 1, surveillance attributes for more details). The community where the CIBS takes place, should always be involved in the monitoring and evaluation of the system. CIBS evaluations are crucial, as they will help us to gather evidence to refine our approach and provide evidence-based recommendations. The Epidemiology Advisor should be consulted if an evaluation of CIBS system is planned.

The timing of the monitoring and evaluation activities, as well as the methods used, should also be clarified in advance. For example:

- Completeness and timeliness are normally part of the ongoing monitoring of CIBS performance: it can be analysed every month using the number of reporting units divided by total expected reporting units.
- Validity or data quality: this can be conducted on a weekly basis in certain reporting units (e.g. one zone of a refugee camp) using supervisory visits in which the reported cases will be verified (e.g. number of correct reports divided by total reports).
- Sensitivity: this should be conducted within a more thorough evaluation which may happen at the end of the emergency, or after the CIBS has been operating for a long time (e.g. after one year). It could be done through dividing the number of outbreaks identified by those missed.
- Other attributes (e.g. usefulness, representativeness, simplicity, flexibility, acceptability and stability) can also be assessed in the evaluation process.
5.12. Phasing out, exit criteria

It is relatively easy to decide when to start an CIBS (we reflect on section 3.1. Why do we implement CIBS?). Deciding when and how to phase out or scale down the CIBS system may be more difficult. For this reason, reflecting on this in advance is recommended (ideally when the CIBS is being planned). We should consider the exit criteria of the project within which the CIBS is operating. For example, in a displacement crisis, the MSF intervention exit criteria could be that the displaced people start returning and MSF’s services are not required anymore, or that other actors are able to take over the health services run by MSF. This hand over should also consider CIBS activities. In some contexts, the CIBS can be transformed into a less intensive event-based community surveillance.

Beyond the project exit criteria, the CIBS could have other specific criteria to orientate the phase out or closure. Some examples:

1. An CIBS was set up in a refugee camp as part of the first response because we did not have any information on health indicators in the community. After a period of intense emergency response, and after many other actors have deployed in the area, we have created a much closer relationship with the community and can close an CIBS; or we may have set up a network of HFs that cover all the areas of the refugee camp. In those situations, we may be able to capture all morbidities at the HF level, so the CIBS may not be needed anymore for disease surveillance.

2. In an outbreak-prone disease area, CIBS was set up because the epidemiological analysis indicated a high risk of outbreak of cholera and/or malnutrition. After some time, the risk analysis changes because the climatic conditions have made a malnutrition crisis less likely, or because there has been a vaccination campaign for cholera with very good coverage. In this case, the CIBS could also be phased down or closed.

5.13. Describe and plan the surveillance system

Considering all the above sections of this document, a clear surveillance system description or surveillance protocol or SOP (standard operating procedure) must be developed. The additional reflections provided in annex 1, about surveillance systems attributes from the perspective of CIBS, can also be helpful to design the CIBS. If time allows, we should have an SOP with as many details as possible. If time is limited, we can start with a simple SOP describing the basic structure and procedures of the CIBS, and try to further elaborate once the system is already running. However, we should always have a document explaining the objectives, how the CIBS will be implemented, and which tools will be used.

This SOP or protocol should consider the following sections:

1. Population under surveillance
2. Coverage: geography (this can include maps), population proportions, ethnicity, population type, etc.
3. Type of surveillance:
   • Passive vs. active
   • Event-based (rumours, clusters or unusual events) vs. indicators based (diseases, deaths, etc.)
   • Exhaustive vs. sentinel
4. List of diseases or items under surveillance (indicators) and case definitions
5. Repository of forms for data collection
6. Thresholds and actions required
7. System organisation (this can be better explained if we use organograms, flow charts or diagrams)
8. Data sources and surveillance networks (normally CHWs)
9. Data flow including forms used, frequency and timelines for data flow
10. Roles, responsibilities and detailed tasks (job descriptions)
11. Data entry and analysis tools: we need to clearly establish which interface we will be using
12. Resources
13. Exit criteria
14. Monitoring and evaluation
6. References and Further Reading

1. The use of epidemiological tools in conflict-affected populations: open-access educational resources for policymakers. LSHTM. http://conflict.lshtm.ac.uk/page_02.htm


Annex 1. Surveillance Attributes

1. Completeness

In the context of CIBS, completeness normally refers to two aspects: whether there are missing and/or unknown data fields in a surveillance database and can be calculated as ‘the number of completed data fields out of the total number of data fields’ (unknown and missing items should be included in the denominator) and; the number of CHWs transmitting the information as expected. In CIBS, we often struggle with areas which are remote or experiencing conflict from where reports cannot be easily sent. In those cases, we can consider other options, for example: text messages, motorbike or taxi systems.

Example for calculation: reports coming per week (or month)/reports expected by week (or month).

2. Validity or data quality

This describes the ability to capture the ‘true value’ of the disease burden.

Internal validity refers to errors within the system. For example, in CIBS, we may have coding errors when transferring data from one level of the system to the next. A data encoder who makes a mistake in the type of disease when entering the information into a computer or confuses between zero cases reported (nil) and missing data (blank), could be considered internal validity problems.

A good way of reducing problems with data quality is appropriate training and supervisory visits.

External validity refers to whether the information recorded is correct. In the context of CIBS, this can include problems with the knowledge and use of case definitions. If a CHW is using the wrong case definitions, or CHWs are trying to make up data (if they have not managed to collect the real data), that will negatively affect the external validity of the data. Training can help alleviate this problem, as well as supportive visits from supervisors and quality checks. We should always monitor the correct use of case definitions and reinforce them if necessary.

Example for calculation: number of items with data problems (e.g. referrals not meeting case def)/total number of items assessed, or number of reports with data issues or data missing/number of reports assessed.

3. Sensitivity, specificity, positive predictive value and negative predictive value

We need to reflect on these attributes in CIBS, but we also need to be aware that these will not be easy to measure. Where possible, they should be documented and quantified. The measure of these parameters normally requires the use of a “gold standard”, a test or reference that we can use as the “true measure”. Unfortunately, in the context of CIBS, we will rarely have other systems or references to compare to (i.e. we will rarely have a “gold standard”). For more details on ideas and suggestions about how to measure sensitivity, specificity, positive predictive value, refer to your Epidemiology Advisor.

Sensitivity

This refers to how many positives we are missing or how many false negatives we are getting. CIBS are very sensitive by nature, as it doesn’t rely on people coming to the HF. Normally, we aim for high sensitivity in CIBS, especially in outbreak situations as we do not want to leave anyone at home who could deteriorate or even die, we would rather send them to be seen in the HF.
Specificity

This refers to how many false positives we are getting. Normally in CIBS, specificity is less of a priority when compared with sensitivity, and we are normally ready to compromise in specificity so we get a high sensitivity. But there are also some disadvantages of low specificity. For example, it can create a critical burden in families that are already in very difficult situations (e.g. the family has to accompany the sick child to the HF leaving behind the rest of the family); and it can be a waste of resources (e.g. referral transports or resources used for triage).

Positive predictive value (PPV) and negative predictive value (NPV)

PPV refers to the probability that a case reported in the surveillance system is a real case. NPV is the probability that a case reported as negative in the surveillance system is a negative case.

PPV and NPV are influenced by the prevalence of disease in the population being tested. If we test in a high prevalence setting, it is more likely that people who test positive really have disease, than if the test is performed in a population with low prevalence. Therefore, the PPV increases with increasing specificity and prevalence; and the NPV will increase with lower prevalence and high sensitivity. Both PPV and NPV may be affected by seasonal patterns of a given disease incidence. In the context of CIBS, when we try to assess the performance of our system on detecting alerts, these parameters will be influenced by the likelihood of an alert occurring. In this regard, it is important that the system is appropriate for the context. For example, if we implement an CIBS system for cholera in an area in which we believe that an outbreak is very unlikely (from the epidemiological information), then our system will most probably have a very low PPV. Hence the importance of a good understanding of the epidemiological context.

4. Timeliness

Timeliness refers to the speed between the different steps (data collection, analysis and actions) in a public health surveillance system. The term ‘reactivity’ reflects the delay before public health actions are initiated.

In the case of CIBS, it is crucial to clearly establish the timeline or a clear cut-off time for each step of the data flow (see section 4.7, data flow). In this way, the timeliness can be evaluated for each of these steps as the number of reports arrived on time divided by the number of reports expected. The timeliness of the response will be crucial, as the public health action is the raison d’être of CIBS.

5. Usefulness

Usefulness means that the surveillance results are used for public health action. Assessing usefulness consists of taking inventory of actions that have been taken in conjunction with the surveillance system.

In CIBS, usefulness can be assessed by counting the number of outbreaks or alerts identified by the CIBS and/or intervened on. It is useful to have a book of alerts in place that specifies: the type of alert, if it could be verified, if an assessment was done, what the outcome was, and if a response was started. Good outbreak response reports can also be very helpful to understand the usefulness of the CIBS. Nonetheless, in CIBS it can be difficult to precisely quantify usefulness. People who have been working in the project for a long time can be a good source of information, and interviews can be helpful to evaluate usefulness.

6. Coverage and representativeness

This refers to the capacity to cover all the events of interest in a given population, all the time, in all areas.

As mentioned above, in an CIBS sentinel surveillance system the coverage will never be 100%, but we can try to make it as representative as possible by trying to capture different areas, different social/ethnic groups (e.g. internally displaced people vs host population), and key areas (e.g. areas of migration transit or with key/vulnerable populations such as miners, commercial sex workers, etc.).
It is also very important to try to establish what percentage of the total population we are covering (by type of population) so we can try to get a good balance between overall population coverage and key populations/areas coverage. We will need population estimates to do this.

In projects where our CIBS is exhaustive (i.e. covers the whole area, like in refugee camps) good coverage should be easier to achieve, but we still need to make sure that this assumption is true. For example, we need to make sure that there are no groups in the camp that are excluded by the CHWs because they belong to a different ethnic group or because their area is not easy to access.

Over time, the representativeness of surveillance data may change for several reasons. In CIBS, this could change because we alter the areas under surveillance, or we change the ratio of CHWs to people surveyed. A change in representativeness could lead to biased conclusions about trends.

7. Simplicity

The simplicity of a public health surveillance system refers to both its structure and ease of operation. CIBS should be as simple as possible while still meeting its objectives.

For example, if we try to set up an CIBS system to provide precise estimates, we will need a well-trained and resourced team and good denominators. For a good denominator, we may need to closely monitor population movements (e.g. weekly arrivals vs departures and/or frequent head counts). All these may reduce the simplicity of the CIBS.

8. Flexibility

A flexible public health surveillance system can adapt to changing information needs or operating conditions with little additional time, personnel, or allocated funds.

For example, a flexible CIBS may be able to immediately start monitoring new populations arriving in the area of interest, or to enhance the quantity of data collected for a certain disease (enhanced surveillance) in case of an outbreak. In this regard, we need to be very careful with the changes we introduce to surveillance systems as this could affect the capture and monitoring of reliable trends of diseases in time (see stability below).

9. Acceptability

Acceptability reflects the willingness of people and organisations to participate in the surveillance system. In CIBS we first need the acceptance of the community and all CIBS should be discussed with community leaders and authorities (including ministries of health) with authorisation obtained. Despite getting authorisation from these entities, we also need to be sure that the community accepts the CIBS and always sees its value. It is crucial to take the time to explain objectives in every visit, at least during the first weeks. This includes explanations on how the data will be used, for example explaining the fact that data will not be shared with other actors so will not negatively affect food rations. The CHWs should always be part of this community and should also accept and see the CIBS value. Furthermore, other actors present in the area should ideally accept the system. Last but not least, it is crucial that the MSF projects teams accept the system and see its value.

Acceptability will obviously have an impact on other attributes such as completeness or sensitivity (e.g. if the community sees the value, they will be more willing to report). We should monitor acceptability continuously.
10. Stability

A stable surveillance system allows for the capturing of trends. For example, a plan for a rotation in the CIBS sentinel sites may not allow for trends capture. In these situations, we either accept that we will not capture trends, or we try to stay in each site for some time (this is especially important for sentinel systems). At the same time, even if we change locations we may be able to continue following the trend, as long as we make sure that the same indicators with the same case definitions are collected.

Changes in case definition will also have an impact on trends. These changes should be carefully considered before being implemented. It is crucial to agree on case definitions with other actors who are or have been present in the area, so our data is comparable.

In CIBS in MSF contexts, stability may not be easy to achieve as we work in very unstable or remote areas. For example, we could be working in areas that are accessible as we are planning the system, but are not accessible three months later when the rain comes, or when conflict breaks out again. When planning the system, we always need to consider every potential scenario and try to come up with contingency plans to keep the system running. For example, we could try to identify locations where the CHWs can bring their forms (e.g. tea shops, markets, water points, etc.) in case the road to their village become inaccessible or communication is lost.

11. Cost-effectiveness

We need to consider what resources will be needed for an effective CIBS.

CIBS will usually be undertaken by CHWs, therefore deciding the most appropriate ratio of CHW to people is crucial (See section 4.3. Teams organisation).

Depending on the resources available we will also have to decide on:

a) Which indicators we want to collect: the more indicators we collect the more training and supervision will be needed, and also less households can be covered within a given time by one CHW. This will increase the resources needed for CIBS.

b) What coverage we want to achieve: do we need an exhaustive or a sentinel surveillance system? Exhaustive CIBS will normally be more resource intensive than sentinel CIBS.

12. Adequacy

It refers to whether the system is well suited for the actual public health objectives that we want to achieve. This will be linked to all the attributes above. For example, an CIBS which aims to detect outbreaks early and includes diseases that do not pose a risk for outbreaks in that area, may not be adequate.
Annex 2. Case Definitions Examples for Community Based Surveillance

A community case definition is two or three easily identified symptoms associated with a specific disease. It is simple and understood by trained volunteers who know what symptoms to look for. Community case definitions are a more basic form of syndromic (symptom) reporting that is used by health professionals in national and other disease surveillance systems. The below suggestions for community case definitions are examples extracted from the documents: i) Integrated disease surveillance and response in the African region, a guide for establishing community based surveillance (by WHO); and ii) Community-Based Surveillance: guiding principles (by IFRC).

<table>
<thead>
<tr>
<th>Case Definition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute flaccid paralysis</td>
<td>Any child with a sudden onset of acute paralytic disease.</td>
</tr>
<tr>
<td>Acute watery diarrhoea</td>
<td>Any person with three or more episodes of watery diarrhoea in one day (especially adults).</td>
</tr>
<tr>
<td>Acute jaundice</td>
<td>Yellow eyes or skin with or without fever.</td>
</tr>
<tr>
<td>Cholera</td>
<td>Any person aged five years or more who has profuse watery diarrhoea.</td>
</tr>
<tr>
<td>Diarrhoea with blood (Shigella)</td>
<td>Any person with loose stools and visible blood in the stool.</td>
</tr>
<tr>
<td>Malaria</td>
<td>Any person with fever in a malaria-endemic area. Any child aged under-five who has an illness with high fever and a danger sign* (*danger signs include lethargy, unconsciousness, vomits everything, convulsions, and in children aged under five years – inability to drink or breastfeed).</td>
</tr>
<tr>
<td>Malnutrition</td>
<td>Normally measured with the MUAC and assessment of presence of bilateral oedema (severe acute malnutrition: MUAC&lt;115 mm or bilateral oedema).</td>
</tr>
<tr>
<td>Maternal deaths</td>
<td>Death of a woman during pregnancy or within 42 days of termination of the pregnancy.</td>
</tr>
<tr>
<td>Measles</td>
<td>Fever with rash.</td>
</tr>
<tr>
<td>Meningococcal meningitis</td>
<td>Any person with fever, a strong headache, and stiff neck.</td>
</tr>
<tr>
<td>Neonatal death</td>
<td>Death of new-borns within 28 days of life.</td>
</tr>
<tr>
<td>Viral Haemorrhagic fever</td>
<td>Fever with bleeding from the nose, eyes or mouth.</td>
</tr>
</tbody>
</table>

Community indicator-based surveillance: briefing paper for field epidemiologists
Annex 3.  Examples of Job Profile/Descriptions for Community Health Workers

Example 1.

<table>
<thead>
<tr>
<th>Job Title:</th>
<th>Community Health Worker (CHW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level:</td>
<td>2</td>
</tr>
<tr>
<td>Status</td>
<td>To be finalised by</td>
</tr>
</tbody>
</table>

**Identification**

<table>
<thead>
<tr>
<th>Job Title:</th>
<th>Community Health Worker</th>
</tr>
</thead>
<tbody>
<tr>
<td>Report to:</td>
<td>Community Health Worker Supervisor</td>
</tr>
<tr>
<td>Report to (functional):</td>
<td>Community Health Worker Supervisor</td>
</tr>
<tr>
<td>Area:</td>
<td>Paramedical</td>
</tr>
<tr>
<td>Location:</td>
<td>In the community</td>
</tr>
<tr>
<td>Level:</td>
<td>2</td>
</tr>
</tbody>
</table>

**Main Purpose**

- To contribute to the health surveillance systems by collecting community information.
- To form a link between the health programmes and the target population.
- To improve the overall health of communities by encouraging good health behaviours through understanding, engaging and providing (health) information related to MSF activities.
Accountabilities

1. Surveillance:
   • To record and report demographic data such as population numbers, ages, mortality rates and suspected cases of outbreak prone diseases.

2. Case finding and referrals of patients; to the relevant health facility/outreach team:
   • According to a defined referral criteria by the medical team, through home visits, and key members of the community.

3. Mobilisation of specific target groups for preventive health programmes:
   • MUAC screening of children U5.
   • Identification of children under 1 years old to be immunised in EPI programme.
   • Identification of pregnant women for the ANC programme.
   • Identification of patients exhibiting signs and symptoms of set diseases for medical team.

4. Follow-up and defaulter tracing:
   • Follow-up of referrals from community to health facilities, and vice versa.

5. Community Engagement
   • Community mapping and networking with local authorities figures of his/her community.
   • Focus groups.
   • Key community member meetings.
   • Community meetings.

6. Health Education
   • One-to-one health education messages.
   • Group health promotion sessions.
   • Supporting the Health Education Supervisors (HES) to give trainings to key stakeholders.

7. Curative, community-based treatment
   • Phase two (with specialised training and supervision), decentralise some treatment and involve key members of the community.

Reporting

• Inform line manager about any possible serious problems or complications during meetings with the population.
• Consolidate the link between the community and the MSF services; give advice on how to better involve the community in the activities of awareness and prevention; indicate possible local actors.

Reporting and timescales:

✔ CHW active case finding and referrals (daily call to HES)
✔ Follow ups (daily calls to HES)
✔ Community engagement meetings, focus groups, health education sessions (daily calls to HES)
✔ Population counts and MUAC forms (Monthly or as requested, to HES)
✔ Rotating CHW focal point to collect all data and phone calls of the area to the HES

NB: During periods of emergency, reporting, tasks and timescales may change.
### Requirements

<table>
<thead>
<tr>
<th>Education</th>
<th>• Literacy level 10th grade or above.</th>
</tr>
</thead>
</table>
| Experience         | • Some experience working with community programmes is an advantage, but not necessary.  
                     • Very active and well accepted in the community, preferably from the community they will be working in. |
| Languages          | • Local language                     |
| Knowledge          | • Essential basic mathematics and knowledge/use of measuring equipment |
| Competences        | • Communication and public speaking, self-motivated |

### General

The responsibilities mentioned above are not exhaustive and other work may be required according to the needs of the project.

Mobility is requested from all MSF staff, including short term assignments from their usual place of work.

Part of any MSF-employee responsibilities is the attendance of trainings as per the requirements of the organisation.

The job description can be modified according to the evolution of the work.

The Job description is an integral part of the contract; therefore, lack of compliance with the above-mentioned rules may be sanctioned with disciplinary measures.

I read and understood the duties described above and accept to perform them as mentioned above.

<table>
<thead>
<tr>
<th>Name</th>
<th></th>
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<tbody>
<tr>
<td>Date</td>
<td></td>
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<tr>
<td>Signature</td>
<td></td>
</tr>
</tbody>
</table>
**Example 2.**

<table>
<thead>
<tr>
<th><strong>Job Title:</strong></th>
<th>Community health worker Supervisor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level:</strong></td>
<td>5</td>
</tr>
<tr>
<td><strong>Status</strong></td>
<td>To be finalised by Medical Team Leader</td>
</tr>
</tbody>
</table>

**Identification**

<table>
<thead>
<tr>
<th><strong>Job Title:</strong></th>
<th>Health Educator Supervisor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Report to:</strong></td>
<td>Health Promotion Manager/Public Health Officer</td>
</tr>
<tr>
<td><strong>Report to (functional):</strong></td>
<td>Medical Activity Supervisor (outreach)</td>
</tr>
<tr>
<td><strong>Area:</strong></td>
<td>Medical</td>
</tr>
<tr>
<td><strong>Location:</strong></td>
<td>Community</td>
</tr>
<tr>
<td><strong>Level:</strong></td>
<td>5</td>
</tr>
</tbody>
</table>

**Main Purpose**

Function:

- To co-ordinate, supervise and participate in community-based surveillance and health education activities in the community, specifically addressing preventive and care components of the programme to general public/targeted groups.
- To be responsible for the supervision of the CHWs and their activities and reporting.
- To be the link between the CHWs and MSF medical team/other health facilities in their area.
- Community engagement link between key members of the community and MSF.
### Accountabilities

#### 1. Supervision and training
- To organise the CHWs’ workload related to appropriate tasks and their job description.
- Evaluate CHWs activities using indicators/targets and give feedback.
- Plan, assess and evaluate training needs.
- Give formal and on-the-job training and supervision to CHWs.
- Supply the CHWs with the required materials.
- Ordering of supplies needed as per the logistics ordering protocols.

#### 2. Communication and coordination
- Maintain good communication and coordination with other actors, hold regular meetings and feedback to MSF medical team.
- To help build and ensure good communication with key community members and other health facilities.
- Support the CHWs in community mapping and networking.
- Co-ordinate referral from the community, with the Medical Activity Supervisor.
- In collaboration with the hospital Medical Activity Manager, take weekly information of ITFC discharges, and co-ordinate the follow-up with the relevant CHWs; and provide monthly feedback to the medical team.
- Weekly meetings with Medical Activity Supervisor, exchanging data and planning.
- Monthly meetings with Health Promotion Manager/ Public Health Officer and other Health Education Supervisors from the project.

#### 3. Human resource management
- To be involved in the preparation and review of job descriptions for the CHWs.
- To prepare work schedules and presence/ absence lists of staff (timesheets and annual leave forms in line with MSF guidelines).
- To organise monthly meetings with the CHWs to discuss problems and provide encouragement.
- Assist in timely and accurate payments of CHWs (including reporting each CHWs targets achieved to finance team).

#### 4. Data collection and reporting:
- To supervise accurate data collection and activities of CHWs (daily).
- To write (weekly) reports on all activities, based on the individual reports from the CHWs.
- Overall CHW and HES report (weekly).
- Attend medical meetings and exchange relevant community information found, the HPCE team’s achievements, challenges, requests and following weeks’ objectives (weekly).
- Monitor the impact of health promotion activities, results and achievements, using set HPCE supervision tools and indicators, and identifying strengths and weaknesses.

#### 5. Health education materials
- Assist in planning, maintaining and developing teaching aid materials and educational resources, based on key messages assigned by the medical I team and in line with the Health Promotion messages of the Hospital; making sure they are adapted and translated in appropriately to the target populations.

#### 6. Community engagement
- Identify key actors (local authorities, local NGOs, traditional healers, formal or informal authorities) to support the dissemination of health information of the target population and be the point of reference for the co-ordination of and networking with these subjects.
### Requirements

<table>
<thead>
<tr>
<th><strong>Education</strong></th>
<th>Completed school education, preferably higher, with excellent reading and writing skills and basic computer skills</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Experience</strong></td>
<td>Working in community projects and management/supervision of teams</td>
</tr>
<tr>
<td><strong>Languages</strong></td>
<td>Fluent in English and the local language</td>
</tr>
<tr>
<td><strong>Knowledge</strong></td>
<td>Basic computer knowledge</td>
</tr>
<tr>
<td></td>
<td>Good communication and social skills, ability to motivate</td>
</tr>
<tr>
<td></td>
<td>Accepted in the community</td>
</tr>
<tr>
<td><strong>Competences</strong></td>
<td>Excellent communication and organisation skills</td>
</tr>
</tbody>
</table>

### General

The responsibilities mentioned above are not exhaustive and other work can be required according to the needs of the mission.

Mobility is requested from MSF staff, including short term assignments from their usual place of work.

MSF-employee responsibilities include the attendance of trainings as per the requirements of the organisation.

The job description can be modified according to the evolution of the work.

The job description is an integral part of the contract. Lack of compliance with the above-mentioned rules may be sanctioned with disciplinary measures.

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<td>Date</td>
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<td>Signature</td>
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</table>
Annex 4. Examples of Forms for Data Collection in Community Indicator-Based Surveillance

Word editable versions of these forms can be found on the Epidemiology section on the OCA Public Health Department portal (SharePoint). You can also contact your epidemiology advisor for further support.
### DEMOGRAPHIC DATA (population count, births and deaths)

<table>
<thead>
<tr>
<th>SHELTERS</th>
<th>POPULATION COUNT</th>
<th>PREGNANT WOMEN</th>
<th>BIRTHS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt; 5 YRS</td>
<td>≥ 5 YRS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MALE</td>
<td>FEMALE</td>
<td>MALE</td>
</tr>
</tbody>
</table>

Start date: 
Site:  
End date: 
Name of CHW: 

---

**Community indicator-based surveillance: briefing paper for field epidemiologists**
DEMOGRAPHIC DATA (population count, births and deaths) - continued

<table>
<thead>
<tr>
<th>DEPARTURES</th>
<th>ARRIVALS</th>
<th>DEATHS SINCE LAST ARRIVAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;5 YRS</td>
<td>≥ 5 YRS</td>
<td>&lt;5 YRS</td>
</tr>
<tr>
<td>Male</td>
<td>Female</td>
<td>Male</td>
</tr>
<tr>
<td>&lt;5 YRS</td>
<td>≥ 5 YRS</td>
<td>≥ 50 YRS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>&lt;5 YRS</th>
<th>≥5 - &lt;50 YRS</th>
<th>≥ 50 YRS</th>
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</thead>
<tbody>
<tr>
<td>Male</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
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</table>

Last arrival data is not available.
## MORTALITY DATA

<table>
<thead>
<tr>
<th>Date of death</th>
<th>Age (yrs)</th>
<th>Sex</th>
<th>Cause of death</th>
<th>Place of death</th>
<th>Visited HF in week before death?</th>
<th>Other details</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

**Age:**
If less than 1yr, specify “<1”

**Sex:**
Male (M), Female (F)

**Cause of death:**
1 = Diarrhoea, 2 = Respiratory, 3 = Malnutrition, 4 = During pregnancy, 5 = Malaria/fever, 6 = Trauma/accident, 7 = Violence, 8 = Unknown, 9 = Other (specify)

**Place of death:**
(1) MSF clinic, (2) Home, (3) Other
### MORBIDITY/DISEASE SURVEILLANCE

<table>
<thead>
<tr>
<th></th>
<th>Diarrhoea</th>
<th>Fever</th>
<th>Fever + Rash</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;5 yrs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥5 yrs</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- For diarrhoea, fever, and fever plus rash, the table shows symptoms reported in children under 5 years (<5 yrs) and 5 years and older (≥5 yrs) across different columns.
### NUTRITIONAL SCREENING DATA (MUAC)

<table>
<thead>
<tr>
<th>Date:</th>
<th>Block:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team:</td>
<td>Name of CHW:</td>
</tr>
</tbody>
</table>

#### 6 – 59 months

<table>
<thead>
<tr>
<th></th>
<th>GREEN</th>
<th>ORANGE</th>
<th>RED</th>
<th>Oedema</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>≥125 mm</td>
<td>115-124 mm</td>
<td>&lt;115 mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● ● ● ● ●</td>
<td>● ● ● ● ●</td>
<td>● ● ● ● ●</td>
<td>● ● ● ● ●</td>
</tr>
</tbody>
</table>

NB: children with oedema are accounted in the “oedema” column only

#### Pregnant and lactating women

<table>
<thead>
<tr>
<th></th>
<th>≥230 mm</th>
<th>185 – 230 mm</th>
<th>&lt; 185 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>● ● ● ● ●</td>
<td>● ● ● ● ●</td>
<td>● ● ● ● ●</td>
</tr>
</tbody>
</table>

Pregnant and lactating women

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Community indicator-based surveillance: briefing paper for field epidemiologists