Early Warning Alert And Response Network in emergencies: evaluation protocol

World Health Organization
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Executive summary

Introduction

The World Health Organization (WHO) and its partners established the Early Warning Alert and Response Network (EWARN) to address the increased risk of communicable disease transmission during humanitarian emergencies, when national surveillance systems may be underperforming or non-functional. Since its introduction, EWARN has been implemented in response to emergencies in many countries. Several evaluations of EWARN have been conducted, however no standardized methodology currently exists. The purpose of this guidance is to provide standardized methods to evaluate EWARN implemented in countries in the Eastern Mediterranean Region of WHO, based on lessons learned from previous EWARN implementation and evaluations.

Guideline objectives

Findings from previous EWARN evaluations consistently revealed these systems were primarily used for weekly reporting rather than early outbreak detection and response. They also demonstrated poor data quality and seldom resulted in public health action. Furthermore, implementation delays and lack of an exit strategy hindered its effectiveness and utility in an emergency setting. For these reasons, this guidance emphasizes both process (e.g. implementation) and operational (e.g. public health action and data quality) procedures.

Evaluation objectives

The objectives of the evaluation are to: 1) describe the EWARN system and how it operates; 2) assess the effectiveness and usefulness of EWARN to meet system objectives; and 3) provide recommendations and practical measures for improvement. The evaluation will ideally examine the whole life of the system, focusing on the preceding three to six months of system implementation, and will be a joint assessment conducted by external evaluators and local counterparts.

Evaluation methodology

The evaluation methodology includes a qualitative and quantitative review of the system. It is divided into three phases. The first is the pre-evaluation or planning phase. It includes obtaining background documents, identifying key stakeholders, planning interviews and site visits and adapting evaluation tools. The second phase is the evaluation, which includes system description and review. The system description provides insight into the system design and intended operation. This is based on the documentation collected in the first phase. System review includes information on the actual system operation and utilizes both qualitative and quantitative analysis to evaluate system attributes. The third and final phase is the post-evaluation phase, which provides conclusions on system strengths and weaknesses, specific recommendations and follow-up measures for system improvements.

Introduction

Background and rationale

Humanitarian emergencies often increase the risk of transmission of communicable diseases, resulting in increased morbidity and mortality, particularly from outbreak-prone diseases. To address this increased risk, the World Health Organization (WHO) and its partners established the Early Warning Alert and Response Network (EWARN), a simplified disease surveillance and response system that focuses on early detection of and rapid response to outbreaks or unusual health events. EWARN is implemented by the ministry of health of the affected country, or its equivalent, with support from WHO and other partner agencies. It is implemented as an adjunct to the national surveillance system during the acute phase of an emergency, when existing communicable disease surveillance systems may be underperforming or disrupted.

Since its introduction in 1999, EWARN has been implemented in response to emergencies in multiple countries, such as Iraq (2013), Lebanon (2006), Pakistan (2005, 2009, 2010), Somalia (2010), Sudan (1999, 2004) and Syrian Arab Republic (2012–13). It has been adapted to the various settings and has been given different names (e.g. DEWS: Disease Early Warning System; CSR: Communicable Disease Surveillance and Response; EWARS: Early Warning Alert and Response System). However, all these systems are based on the same principles following the WHO guidelines for EWARN implementation[2].

[2] Outbreak surveillance and response in humanitarian emergencies: WHO guidelines for EWARN implementation. Geneva: World Health Organization; 2012.

Purpose

Systematic evaluation of EWARN implemented during emergencies provides opportunities for ensuring the system effectively meets its objectives. Previous EWARN evaluations and reviews have been conducted in several countries[3,4,5,6,] but there is no standard guidance to conduct a systematic evaluation of these systems. The purpose of this document is to provide standardized methods to evaluate EWARN implemented in the countries affected by humanitarian emergencies and is based on lessons learnt from previous emergencies and systems' evaluations. Realities on the ground will dictate the exact methods used for the evaluation and may require modifications to these standardized guides and tools. The overall goal is to strengthen the effectiveness and operational efficiency of EWARN in future emergencies.

The main findings from previous EWARN evaluations consistently revealed that these systems were primarily used for weekly reporting rather than early outbreak detection and response, demonstrated poor data quality and seldom resulted in public health action. Furthermore, implementation delays and lack of an exit strategy hindered its effectiveness and utility in an emergency setting. For these reasons, this guidance emphasizes both process (e.g. implementation) and operational (e.g. public health action and data quality) procedures.

Approach

This protocol is based on a review of tools and methods from six previous EWARN evaluations[7], existing surveillance system evaluation guidelines[8,9,10,] and follows the Centers for Disease Control and Prevention (CDC) guidelines to evaluate a public health surveillance system[11,12,13]. This guidance will focus on reviewing the following attributes: simplicity, flexibility, data quality, acceptability, sensitivity, predictive value positive, representativeness, timeliness, stability and usefulness, as well as the implementation process and exit strategy.

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3 Sudan EWARS 2004, South Sudan EWARN 2009, Sudan EWARS 2009, Pakistan DEWS 2011, South Sudan EWARN 2012, and Somalia Communicable Disease Surveillance and Response 2014.

4 Early warning surveillance and response in emergencies: report of the WHO technical workshop, 8–7 December 2009. Geneva: World Health Organization; 2010.

5 Early warning surveillance and response in emergencies: report of the second WHO technical workshop. 11–10 May 2011. Geneva: World Health Organization; 2011.

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7 Sudan EWARS 2004, South Sudan EWARN 2009, Sudan EWARS 2009, Pakistan DEWS 2011, South Sudan EWARN 2012, and Somalia Communicable Disease Surveillance and Response 2014.

8 Communicable disease surveillance and response systems: guide to monitoring and evaluating. Geneva: World Health Organization; 2006.

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10 Data quality monitoring and surveillance system evaluation: a handbook of methods and applications. Stockholm: European Centre for Disease Prevention and Control; 2014.

11 Centers for Disease Control and Prevention. Updated guidelines for evaluating public health surveillance systems: recommendations from the guidelines working group. MMWR. 50;2001 (No. RR13-)

12 Centers for Disease Control and Prevention. Framework for evaluating public health surveillance systems for early detection of outbreaks; recommendations from the CDC Working Group. MMWR. 2004;53 (No. RR-5)

13 Teutsch SM, Churchill RE, eds. Principles and practice of public health surveillance, 2nd ed. New York: Oxford University Press; 2000.

Evaluating EWARN

This protocol establishes standard practices for evaluating EWARN systems, focusing on common challenges faced by the implementation, operations, and termination of the EWARN system as the crisis comes to an end, as well as the challenges faced by the evaluation itself.

Standard templates and indicators are provided (see Appendices 1–3), but these should be adapted based on the settings and context of the evaluation. Special consideration has been given to conducting remote evaluations as security and physical access to participating facilities and personnel may often be limited.

Evaluation objectives

- Describe the EWARN system and how it operates within the emergency-affected area.
- Assess the effectiveness and usefulness of EWARN to detect, confirm, and respond to priority diseases.
- Provide recommendations and practical measures to improve system performance.

Evaluation period

The evaluation should describe the evolution of the system from initial implementation to its current status; however data collection should focus on the preceding 3–6 months prior to the evaluation and may vary based on the situation and length of system implementation.

Evaluation team

A formal evaluation should be a joint assessment conducted by external evaluators and corresponding local counterparts. The size of the evaluation team will depend on the extent and scope of the evaluation, but should consist of a minimum of three people with experience in infectious disease epidemiology and surveillance in emergencies. The evaluation should be planned for a maximum of 2 weeks in-country, although remote data collection and analysis may take longer. While this guidance has been developed for the purpose of a comprehensive external evaluation, the methods and indicators may be useful for internal periodic monitoring of the system. See Appendix 4 for minimum monitoring indicators.

Process

This evaluation is based on a qualitative and quantitative review of the system. This guidance has been divided into three phases: pre-evaluation (planning and preparation), evaluation (system description and review), and post-evaluation (conclusions and recommendations). It also provides alternatives for remote evaluation if access or time is limited.

Pre-evaluation: planning and preparation

Evaluation methods

When planning an evaluation following a humanitarian emergency, it is important to consider possible limitations such as access to health facilities, security concerns, time constraints or other restrictions. In order to minimize biases introduced by only evaluating accessible sites, two protocol methods are described below: on-site and remote (Table 1). Depending on the situation and setting, components of both protocol methods (on-site and remote) may be used. See Appendix 5 for remote evaluation planning, and Appendix 6 for administrative and logistic considerations when planning an evaluation.

Table 1. On-site versus remote evaluations

Method	Question	Process
On-site	To be used when facilities/sites are physically accessible and there are minimal restrictions to conduct the evaluation	Interviews of all relevant stakeholders and document review should be conducted in person as outlined in this guidance document
Remote	To be used when facilities/sites/ staff are physically inaccessible due to security concerns or other factors	Interviews of key stakeholders should be conducted via phone or internet and copies of documents should be obtained electronically for review Additional field staff with access may be trained to conduct interviews and document review at remote sites Self-administered questionnaires may be sent to stakeholders and copies of documents obtained electronically for review if other options not available

Background information

While preparing for the evaluation, identify and obtain all relevant documents pertaining to the system. These documents will provide information on the background and operational context of the system, and help adapt the methodology and tools for the system review to conduct a comprehensive evaluation. Additional background information may be collected during the evaluation.

Data sources to facilitate system review and evaluation

- EWARN funding proposal, standard operating procedures, field manuals, protocols and other operational documents;
- blank data collection and reporting tools (i.e. forms that have not been completed);
- weekly surveillance: case definitions, patient registers, weekly reporting forms database and any other data collection and reporting tools;
- outbreak detection and response: alert notification, verification, and investigation forms, laboratory registers, and outbreak logbook/register;
- laboratory: list of laboratory facilities, specimen referral and reporting forms, registers, laboratory standard operating procedures;
- outputs (e.g. reports, epi bulletins, etc.);
- documentation of previous training (e.g. training manuals, presentations, etc.);
- notifications to WHO International Health Regulations (IHR, 2005) focal point for potential public health emergencies of international concern (PHEIC) within the past 3–6 months, or the selected evaluation period, as mandated by IHR (2005);
- list of ministry of health or nongovernmental organization supported health facilities in the area that do not participate in EWARN;
- any other relevant documents (e.g. previous evaluations, progress reports, policy reports, etc.).

Site selection

It is not always possible or necessary to visit or review documents from all sites involved with EWARN. Emphasis should be on obtaining a representative sample of the system and good quality data from these sites, therefore it is better to focus on fewer sites if time and resources are limited. The suggested number of sites to select are:

- all EWARN hospitals
- all other reporting sites if < 25 total
    - if 25–50 sites, then select 75%
    - if 51–100 sites, then select 50%
    - if > 100 sites, then select an average of 50 sites, depending on available resources and time.

It is also important to select a variety of sites that are as representative as possible of the system and the population under surveillance. Some characteristics to consider when selecting sites are:

- rural and urban
- number of beneficiaries
- ministry of health-supported and nongovernmental organization-supported
- geographically dispersed
- frequent alerts and few or no reported alerts
- regular/timely reporting and delayed reporting
- reporting completeness and incompleteness
- administrative levels, including national/central level and sub-national levels.

Document review and key informant interviews

The following section includes guidance on obtaining relevant documents in preparation for document review and identifying the appropriate personnel for key informant interviews at each administrative level of the system. Confirm availability and accessibility of individuals and sites for interview and document review with in-country staff. Information from inaccessible key informants and sites should be obtained by alternative means (e.g. phone, email, etc.) and will require advance planning.

The following documents are required for the document review section (see Appendix 2):

- at health facility-level: patient registers, laboratory registers and weekly reporting forms
    - time period: 5 non-consecutive epi weeks from the evaluation period. Ensure epi weeks are the same for all materials
- at district/governorate/central level: alert logbook, laboratory register, epi bulletins, outbreak investigation forms and database
    - time period: entire evaluation period.

Central level indicates the highest administrative level at which the system is implemented. Depending on the system, this may be at the federal or national level or on a smaller scale at the state or regional level. Table 2 provides guidance on key informants to interview and documents to review at the central level.

Table 2. Central level data collection requirements

Key informants to interview	All persons involved in development or initial implementation of EWARN, all persons involved in central administration of EWARN (ministry of health, WHO, nongovernmental organizations), Rapid response team leader and/or additional members participating in alert verification and outbreak investigation and response at central level, central level data manager, central public health laboratory technician or infectious disease specialist
Questionnaires needed	Technical lead and implementation, central level surveillance staff, rapid response team, data manager, central laboratory (see Appendix 1 for questionnaire templates)
Data sources to review	Outbreak/alert log, alert investigation forms, central database, weekly bulletins, laboratory registers

Mid-level key informants include personnel supporting EWARN at the sub-central level, which may be state, region or district depending on the organization of the system. Table 3 provides guidance on mid-level key informants to interview and documents to review.

Table 3. Mid-level data collection requirements

Key informants to interview	EWARN focal points or public health officials in charge of surveillance at sub-central level (all surveillance officers responsible for selected reporting sites under evaluation within an administrative areas, i.e. all district, state, governorate-level surveillance officers), rapid response team leader and/or additional members participating in alert verification and outbreak investigation and response at the sub-central level, at least one laboratory technician or infectious disease specialist per state or region public health laboratory, at least one partner organization supporting health facilities that participates in EWARN per sub-central administrative unit
Questionnaires needed	Surveillance officer, rapid response team, peripheral laboratory, EWARN partners (see Appendix 1 for questionnaire templates)
Data sources to review	Alert notification and verification forms (if available), outbreak/alert log, alert investigation forms

Field level data collection at the reporting site includes interviews with EWARN staff, partners supporting reporting sites, clinicians and laboratory personnel, community health workers (if applicable) and non-EWARN facilities (if applicable). Table 4 provides guidance on key informants to interview and documents to review at reporting sites. Criteria to consider when selecting reporting sites are provided below the table.

Table 4. Field level data collection requirement

Key informants to interview	EWARN focal points at all selected reporting sites, at least one health care provider at all selected reporting sites, laboratory technician at all selected reporting sites (if applicable), at least one community health worker or leader in the catchment area of all selected reporting sites, at least one facility that does not regularly participate in weekly EWARN reporting per sub-central administrative unit in which an EWARN reporting site has been selected for evaluation
Questionnaires needed	Reporting site, clinician, peripheral laboratory, community, non-EWARN facilities (see Appendix 1 for questionnaire templates)
Data sources to review	Patient registers, weekly reporting forms, laboratory registers

Community members and non-EWARN facilities in the same area as EWARN reporting sites may also be considered for key informant interviews to provide information on their role in surveillance and outbreak detection and response in the area, and are also included in Table 4.

Tool adaptation and piloting

Lastly, adapt evaluation tools (interview forms, questionnaires and other data collection tools) for the evaluation setting. Although standardized templates are provided in this guidance document, each evaluation will need to be modified based on the context, setting and accessibility. The tools must be piloted and finalized in-country or after discussion with in-country partners if conducted remotely, prior to the evaluation. Piloting evaluation tools involves testing adapted forms with 1–2 EWARN staff to ensure readability and usability, in particular to ensure language and content are appropriate, relevant, and comprehensive; and making any necessary changes (adding or removing questions, rephrasing, correcting translations, etc.) based on pilot test prior to conducting the evaluation.

Evaluation

System review

This section focuses on describing the system design and intended operation. Information obtained during the pre-evaluation or planning stage provides insight into describing the system. This includes the setting and context, implementation strategy, operational plan and transition or exit strategy. Information obtained during the evaluation should describe the actual operations. The system description should capture information from the time of initial implementation to its current status and include changes that have taken place over time such as, but not limited to, changes in sentinel sites, priority conditions, case definitions and thresholds. Key topics to include in the system description are listed below along with their possible sources. These sources are not exhaustive and any additional relevant documents should be included in the review.

Describe the following characteristics:

Country and crisis setting

- Relevant documents: Office for the Coordination of Humanitarian Affairs (OCHA) documents, Strategic and Humanitarian Response Plans (formerly Flash Appeals), country reports, UN situational reports (sitreps), system proposal, funding proposal, etc.
    - onset, cause and type of emergency
    - security conditions
    - distribution and characteristics of displaced persons, including any relevant factors that may affect access to health care
    - health system and infrastructure, including population served
    - epidemiological background.

Overview of EWARN

- Relevant documents: system proposal, funding proposal, letters of intent or memorandums of understanding, standard operating procedures, field manuals, protocols, data collection and reporting tools, previous evaluations, etc.
    - name of the system
    - purpose and objectives
    - responsible ministry/organization
    - implementation:
        - § trigger to implement
        - § time to implement from emergency onset
        - § time to establish/roll-out
        - § motivators and barriers to implement including:
            - selection of priority conditions and consensus process
            - selection of sites, referral laboratory and criteria used
            - timeline for weekly reporting (epi week)
            - alert notification, verification, and investigation process
            - responsible personnel at each level
            - development or modification of reporting forms, case definitions

- partner buy-in (ministry of health, nongovernmental organizations, community, others) and roll-out

- intended geographical and population catchment area
- list of stakeholders/supporting partners and their functions at all levels
- succession plans (transition from EWARN in emergencies to national routine surveillance):
  - intended duration
  - exit strategy.

Resources

- Relevant documents: system proposal, funding proposal, standard operating procedures, previous evaluations, progress reports, etc.
  - personnel assigned to implement and maintain the system
  - logistical resources, including tablets, computers and communication equipment (i.e. telephone, internet, etc.), maintenance of hardware, software, consumables, electricity
  - supply of data collection tools (e.g. registers, weekly reporting forms, etc.)
  - transport and fuel requirements for system maintenance, operation (including specimen transport) and supervision
  - laboratory capacity, including tests performed or referred
  - cost of the system and source of funding;
  - mechanism of IHR (2005) notification and any notifications over the preceding 12 months.

System evaluation

There are often differences between intended and actual operation, and it is important these differences are captured by the evaluation. Review of the system processes via stakeholder interviews, direct observation, and document review will provide information on the actual operation and function of the system. Key topics to evaluate are listed below.

Objectives and operational context

Describe the following operational procedures.

- Relevant documents: standard operating procedures, field manuals, case definitions, registers, weekly reporting forms, database, etc.:
  - diseases/syndromes covered by the system, case definitions and alert thresholds
    - diseases tested or specimens referred for disease testing
  - data flow, timeline, and reporting structure (see examples of diagrams in Fig. 1 and 2)
    - steps for reporting
    - staff role at each level
    - quality control procedures
    - time intervals for data transfer for both alert notification and weekly reporting
    - mode of outbreak detection (formal, informal)
    - methods of feedback
    - types of outputs (e.g. case investigation reports, epidemiological bulletins)
  - data entry and analysis
    - position/levels responsible for entering, analysing and interpreting data
    - software or data management program used
    - quality control procedures
    - analytic methods and indicators
  - public health actions and responses taken
  - feedback products and system outputs
    - to whom, how, and when is feedback provided and outputs shared
  - monitoring and supervision
  - linkages to existing surveillance system(s) and/or donor-run systems
  - training requirements for staff and partners for all aspects of EWARN.

It is important to observe data flow at the various levels and to interview relevant staff in order to understand the actual process.

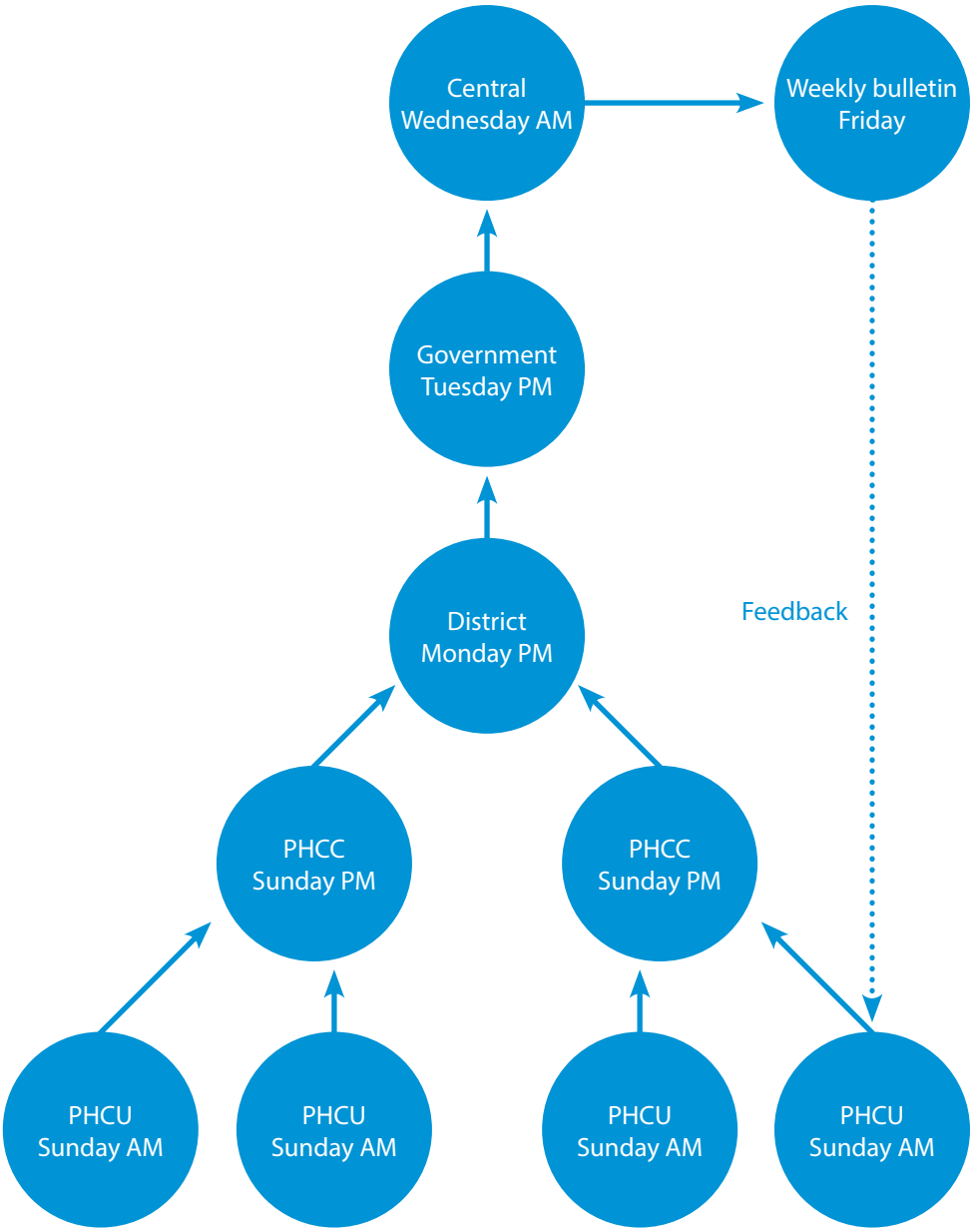


Fig. 1. Weekly reporting (PHCC = primary health care centre; PHCU = primary health care unit)

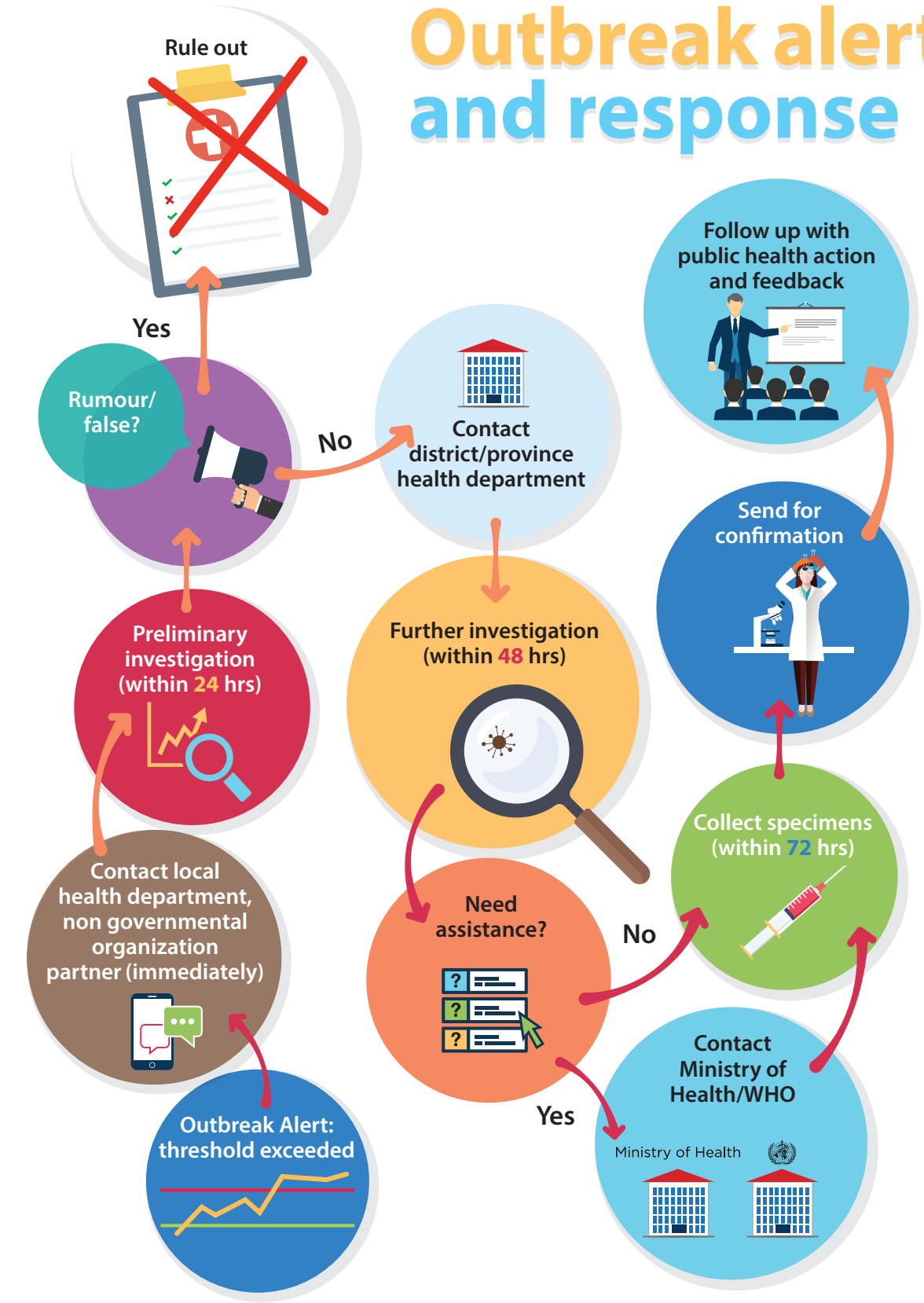


Fig 2. Outbreak alert and response

System attributes

System attributes help define the overall quality and utility of a surveillance system. A combination of qualitative and quantitative methods via stakeholder and key informant interviews, document review, and direct observation is necessary to obtain a complete analysis of system attributes. Data collected using the questionnaires and tables indicated below should be entered into a data entry software program (Excel, Epi Info, etc.) for analysis (see data analysis and example calculations in Appendix 7). Based on the findings for each attribute, one overall rank based on the indicators, such as a Likert score (e.g. good, mixed, poor, etc.), should be given to each attribute. Definitions of attributes can be found in the Glossary of terms at the end of this guide.

Key informant interviews: Use the questionnaire templates (Appendix 1) to capture the minimum key information per attribute listed below:

- Simplicity:
  - EWARN integration with other systems
  - method to collect, manage, enter, analyse and disseminate data
  - time spent on maintaining the system
  - amount and type of data collected for each priority disease (e.g. demographics, exposure information, etc.)
  - system training.
- Flexibility:
  - process to add/remove health units/partners
  - retrospective review of how system responded to a new demand such as:
    - emerging health events
    - changes in case definitions
    - variations in funding.
- Data quality:
  - quality control practices
  - critical discussion of data and reports with partners
  - use of standardized tools and forms
  - staff who can correctly identify immediately notifiable diseases
  - staff who accurately provide case definitions
  - staff who accurately provide alert thresholds

- staff who can correctly explain the alert notification procedure
- training:
  - current surveillance officers trained in EWARN
  - current EWARN health facility staff trained in EWARN
  - new EWARN health facility staff (hired within the past 6 months) trained in EWARN
  - new EWARN partners/reporting sources (added within the past 6 months) trained in EWARN
  - length of trainings (initial and refresher)
  - most common/primary training topics
  - primary training facilitators
- supervision and feedback:
  - health facilities which received feedback in previous 4 weeks; in previous 8 weeks;
  - health facilities which received supervisory visits in previous 4 weeks; in previous 8 weeks.

- Acceptability:
  - barriers to reporting
  - organization/agency/staff willingness to participate
  - perceived strengths and weaknesses of the system
  - support and feedback to EWARN staff
  - regular meetings to review EWARN (strengthen practices, discuss progress, feedback, etc.)
  - internal review of the data
  - responsiveness of the system to suggestions or comments.
- Representativeness:
  - groups or subgroups not covered by or included in the system
  - systematic exclusion or barriers to health care access.
- Stability:
  - functioning tools/equipment and resources for weekly surveillance and outbreak

detection and response

- interruptions to reporting and impact on the system
- costs involved to maintain the system
- staff turnover
- time in current position and EWARN-related activities
- uninterrupted weeks with functioning health facilities in the last 6 months. Usefulness:
- perceived usefulness of EWARN data and bulletins
- public health action (e.g. control measures implemented) based on data from EWARN
- system's ability to meet its objectives
- system's ability to help improve clinical, behavioural, social, policy or environmental practices.

Document review: Use the Document review guide (Appendix 2, A–H) to capture the minimum key information per attribute listed below.

- Data quality:
  - legibility of patient registers (Question A1)
  - completeness of patient registers (Question A2)
  - case concordance for weekly surveillance (Question B2) and alerts (Question C2)
  - completeness of weekly reporting forms (Question D)
  - application of case definition based on observation (if feasible) (Question E)
  - completeness of central database (Question G1)
  - regularity of reporting sites (Question G2).
- Sensitivity:
  - of mode of detection (Question F2)
  - by disease, if feasible (Question F2).
- Predictive value positive (PVP) of alerts:
  - overall PVP (Question F2)
  - by disease, if feasible (Question F2).

- Timeliness:
  - time from alert notification to verification (Question F2)
  - time from alert verification to investigation (Question F2)
  - time from investigation to receipt of results (Question F2)
  - time from verification to implementation of control measures (Question F2)
  - sites reporting by the weekly deadline (Question H).

Laboratory review: Use the laboratory questionnaire in Appendix 1 to calculate the minimum key information per attribute listed below.

- Simplicity:
  - priority conditions that can be laboratory-confirmed
  - method for reporting results of immediately notifiable conditions.
- Data quality:
  - use of standardized forms
  - legibility of laboratory registers (Question 14a)
  - completeness of laboratory registers (Question 14a)
  - diagnostic tests for which standard operating procedures are available
  - diagnostic tests for which quality control is performed
  - specimen collection:
    - specimens received with a label, with a unique identifier (ID) (Question 9a)
    - specimens received with adequate material for testing (Question 9a)
    - specimens received in recommended container, including packaging and temperature (Question 9a)
    - specimens received with associated specimen form (Question 9a)
    - specimens with date and place of specimen collection on form (Question 9a)
    - specimens with all other data entries on form completed (Question 9a)
    - specimens with receipt time at laboratory recorded (Question 9a).
- Timeliness:
  - samples expected to be analysed within 24 hours, within 48 hours
  - time from specimen arrival at laboratory to results from referral laboratory

- time from specimen collection to arrival in laboratory (Questions 15a and 15b)
- time from specimen arrival at laboratory to testing (Questions 15a and 15b)
- time from testing until result reported to collection site (Questions 15a and 15b)
- time from specimen collection until results reported (Questions 15a and 15b).

- Stability:
  - staff reporting resources for specimen storage and diagnostic testing.

Conclusions and recommendations

Share preliminary results of the evaluation with relevant country stakeholders (ministry of health, the health cluster, WHO offices, etc.) prior to departure. A final report should be disseminated to all relevant stakeholders within 4 weeks of completing the evaluation or, if done remotely, within 4 weeks of receipt of all data.

1. Determine whether the system is meeting its objectives based on your evaluation. Ensure all areas outlined in this guidance document have been addressed and system attributes have been adequately reviewed. Please see Appendix 8 for a checklist for review of pertinent items and topics.
2. Results and conclusions may be reported separately for weekly surveillance and for outbreak detection and response as system performance may vary greatly between these objectives. Appendix 9 contains common evaluation findings and causes to consider.
3. Summarize strengths and weaknesses of the system and provide recommendations on how the system may be improved, including sustainability issues (funding sources, evolution of the system, strategy for integration into/harmonization with existing systems and programmes and transition to a routine surveillance system) and/or continued monitoring of the system. Key indicators for monitoring EWARN are outlined in Appendix 4. For ease of understanding the findings of the evaluation presented in the report, each attribute should be ranked as a Likert score, such as good, fair or poor.
4. Include 3 months and 6 months post-evaluation follow-up of recommendations, person responsible for each recommendation and a timeline for completion of specific activities. The suggested times to the next evaluation based on the current evaluation and overall scores are: 24–36 months for a score of 'good', 13–23 months for a score of 'fair', and 6–12 months for a score of 'poor'.

Appendix 1

Appendix 1. Questionnaire templates

Technical lead and initial implementation questionnaire

The implementation questionnaire should be used to interview the technical lead(s) of the system who were involved in development or initial implementation of EWARN. The purpose of this questionnaire is to understand:

- context for which EWARN was established;
- plan and strategy for system implementation and maintenance;
- changes over time from initial conception to implementation (evolution of the system);
- adherence to implementation guidelines;
- insights into differences between intended and actual function.

Indicators that may be calculated from responses are provided next to the question in the "Indicator" column. See Appendix 7 for example calculations.

Name/ID number of technical lead: .....

Name of interviewer: .....

Date of interview (dd/mm/yy): .....

Technical lead and initial implementation questionnaire

Question	Indicator
I. General	
1. What is your title?	
2. How many months have you been involved with EWARN? a. In your current position: ..... b. Total:	Average time in current position (*stability*) Average total time working on EWARN (*stability*)
3. What are your primary responsibilities? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. EWARN only i. Data compilation/aggregation ii. Data entry iii. Data review iv. Data analysis and interpretation v. Alert/outbreak investigation vi. Other (specify): ..... b. Other non-EWARN related duties (specify):	Main EWARN-related responsibilities Percentage of respondents with additional responsibilities outside of EWARN (*stability*)
4. How many hours per week do you spend on EWARN-related tasks?	Average time spent on EWARN-related tasks (*acceptability*)
5. In your opinion, what is the primary purpose of EWARN?	Primary purpose of EWARN according to respondents (*usefulness*)

Question	Indicator
II. System implementation	
6. What was the trigger to initially implement EWARN in this emergency?	Purpose of system appropriately matched (*usefulness*)
7. Was there a routine surveillance system in the area before the emergency (i.e. for the affected population)? YES/NO If yes, please describe the routine surveillance system and its status at the time of EWARN initial implementation.	
8. How long after the start of the emergency was EWARN initiated?	Time from emergency onset to trigger (*timeliness*)
9. Who is funding the system?	(stability)
10. Is there funding for the next 12 months?	(stability)
11. How long did it take to roll-out EWARN (i.e. time from initiation until EWARN was fully implemented and the first weekly reports were produced)?	Time indicated from initiation to roll-out (*timeliness*)
12. What activities did you undertake as part of the implementation process? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. assessment b. identification of potential partners c. development and adaptation of tools d. other (specify):	

Question	Indicator
13. What challenges did you encounter during the implementation process? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. Funding b. Human resources c. Security d. Lack of government support e. Other (specify): ..... In your opinion, how could these delay factors be addressed when implementing future EWARN systems in crisis?	Main barriers described (*stability, acceptability*)
14. Which component (weekly reporting or outbreak detection and response) was more difficult to implement? What were some constraints or challenges to implementing weekly reporting? .... What were some constraints or challenges to implemented outbreak detection and response?	Percentage of respondents who report weekly surveillance is harder to implement than outbreak detection and response (*simplicity, acceptability*) Main reasons for difference in ease of implementation (*acceptability, stability*)
15. How were health events selected, and what was the consensus process?	*(simplicity, acceptability)*
16. How were reporting sites selected; what were the criteria used?	*(simplicity, acceptability)*
17. What is the transition plan from EWARN to routine reporting once the emergency phase is over?	*(simplicity, stability)*

Question	Indicator
18. If routine surveillance existed before the emergency, does the transition plan include activities for strengthening or (re-) establishing the routine surveillance system? If yes, what are the planned activities and funding sources? If no, explain.	*(simplicity, stability)*
III. Conclusion	
19. What do you find most interesting or useful about EWARN? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. Monitor health trends b. Detect outbreaks early c. Provide information to donors d. Share information with partners e. Know what is going on in various geographic areas f. Other (specify):	Most common likes (*acceptability, usefulness*)
20. What are the most challenging parts of EWARN? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. Not enough training b. Not enough funding c. No commitment from higher levels of authority d. Communication problems e. No response for alerts or outbreaks f. Other (specify):	Most common challenges (*acceptability, usefulness*)
21. Do you have any suggestions to improve or update EWARN?	Most common suggestions (*usefulness*)

Central level surveillance staff (ministry of health, WHO) questionnaire

The central level questionnaire should be used to interview staff involved in central administration of EWARN (Ministry of Health of the affected country [or its equivalent], WHO national or regional surveillance staff, or nongovernmental organization central level health-related staff). The purpose of this questionnaire is to understand:

- how the system functions;
- linkages to existing surveillance systems;
- plan and strategy for system maintenance;
- data flow;
- insights into differences between intended and actual function.

Indicators that may be calculated from responses are provided next to the question in the "Indicator" column. See Appendix 7 for example calculations.

Name of agency/organization: .....

Name/ID number of staff: .....

Name of interviewer: .....

Date of interview (dd/mm/yy): .....

Central level surveillance staff (Ministry of Health, WHO) questionnaire

Question	Indicator
I. General	
1. What is your title?	
2. How many months have you been involved with EWARN? a. In your current position ..... b. Total:	Average time in current position *(stability)* Average total time working on EWARN *(stability)*

Question	Indicator
3. Were you part of the implementation team? YES/NO If no, skip to Q8.	
4. What activities did you undertake as part of the implementation process? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. Assessment b. Identification of potential partners c. Development and adaptation of tools d. Other (specify):	
5. What challenges did you encounter during initial implementation? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. Funding b. Human resources c. Security d. Other (specify): ..... In your opinion, how could these challenges be addressed when implementing future EWARN systems in crises?	Main barriers described *(stability)*
6. What is the transition plan from EWARN to routine reporting once the emergency phase is over?	(*simplicity*)
7. Routine surveillance existed before the emergency, does the transition plan include activities for strengthening or (re-)establishing the Routine surveillance system? If no, explain. .... If yes, what are the planned activities and funding sources?	(*simplicity*)
8. In your opinion, what is the primary purpose of EWARN?	Primary purpose(s) of EWARN according to respondents (*acceptability, usefulness*)

Question	Indicator
9. What are your primary responsibilities (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. EWARN only i. Data compilation/aggregation ii. Data entry iii. Data review iv. Data analysis and interpretation v. Alert/outbreak investigation vi. Other (specify): ..... b. Other non-EWARN related duties (specify):	Main EWARN-related responsibilities Percentage of respondents with additional responsibilities outside of EWARN (*stability*)
10. How many hours per week do you spend on EWARN-related tasks?	Average time spent on EWARN-related tasks *(acceptability)*
II. Supervision, feedback and training	
11. Do you review the weekly EWARN data? YES/NO If yes, what do you review? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. Missing data b. Large variations in numbers c. Unusual or new diseases d. Other (specify): ..... What do you do if you find something wrong? ..... If you do nothing, why not?	Percentage of respondents who review weekly reporting form (*data quality*) Main reasons for review and action (*data quality*)

Question	Indicator
12. How often do you provide feedback to surveillance or health staff on data collected for EWARN? a. Daily b. Weekly c. Monthly d. Do not provide feedback à skip to Q14 e. Other (specify):	Frequency of feedback to reporting site staff on EWARN data (*data quality*)
13. How do you provide feedback to surveillance or health staff? *(Circle all that apply; do not read responses aloud)* a. Via Skype/Viber/WhatsApp/Facebook messenger/etc. b. Email c. Cell phone d. Landline e. Facility visit: date of last visit: ..... f. Workshops/trainings g. Other (specify):	Main method of feedback (*data quality*)
14. How often do you provide supervision to surveillance or health staff on data collected for EWARN? a. Daily b. Weekly c. Monthly d. Do not provide supervision à skip to Q16 e. Other (specify):	Frequency of supervision of reporting site staff on EWARN data (*data quality*)
15. How do you provide supervision to surveillance or health staff? *(Circle all that apply; do not read responses aloud)* a. Via Skype/Viber/WhatsApp/Facebook messenger/etc. b. Email c. Cell phone d. Landline e. Facility visit: date of last visit: ..... f. Workshops/trainings g. Other (specify):	Main method of supervision (*data quality*)

Question	Indicator
16. Do you hold regular meetings with **EWARN surveillance officers**? YES / NO If **yes**, how often? a. Daily b. Weekly c. Monthly d. Other (specify): ..... If no, why not? ..... à skip to Q17	Percentage of respondents with regular meetings with EWARN surveillance staff (*acceptability*) Frequency of meetings (*acceptability*)
16a. How are the meetings conducted? (*Circle all that apply; do not read responses aloud*) a. Via Skype/WhatsApp/etc. b. Cell phone c. Landline d. In person (specify location):	Primary method of meeting *(acceptability)*
16b. What topics are discussed? (*Circle all that apply; do not read responses aloud*) a. Strengthen practices b. Training refresher c. Progress since last meeting d. Solicit feedback e. Outbreak investigation and response f. Other (specify):	Primary topics discussed in meetings (*acceptability, data quality, usefulness*)

Question	Indicator
17. Can you tell me about the most recent EWARN training you provided to surveillance or health staff? a. Not able to provide information (Circle one, skip to Q18): b. Did not provide training/Don't remember c. Date: ..... d. Duration: ..... (days) e. Venue: ..... f. Topics covered (Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud): i. Case definitions ii. Outbreak investigation iii. Data analysis iv. Specimen collection v. Form completion vi. Case management vii. Preparedness viii. Other (specify):	Average duration of most recent training provided (*data quality*) Average time since most recent training given (*data quality*) Main topics covered (*data quality*)
18. How often do you (your agency/organization) provide EWARN trainings to *(Circle all that apply; do not read responses aloud)*: a. EWARN surveillance staff (including nongovernmental organization data management staff) i. Regularly (specify frequency): ..... ii. When new staff join iii. Sporadically (depending on time, access, funds, etc.) iv. No additional training since initial training v. Never provided training vi. Other (specify): ..... b. Health facility staff i. Regularly (specify frequency): ..... ii. When new staff join iii. Sporadically (depending on time, access, funds, etc.) iv. No additional training since initial training v. Never provided training vi. Other (specify): ..... c. Rapid response team i. Regularly (specify frequency): ..... ii. When new staff join iii. Sporadically (depending on time, access, funds, etc.) iv. No additional training since initial training v. Never provided training vi. Other (specify):	Frequency of trainings provided to surveillance staff, reporting site staff, health partners, Rapid response team *(data quality)*

Question	Indicator
III. Outbreak detection and response	
19. Can you tell me what an alert is?	Percentage of respondents who can define an alert (*data quality*)
20. How are you notified of an alert? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. EWARN data/ bulletins b. Surveillance staff/ EWARN reporting channels c. Health facility staff d. Nongovernmental organization staff e. Community (e.g. community leaders, community health workers, members, etc.) f. Media g. Other (specify):	Main alert notification method (*simplicity*)
21. What was the last alert notification you received (include disease and date)? ..... a. How were you notified? ..... b. What was the outcome?	Most frequent diseases of last alert notification (*usefulness*) Most common method of last alert notification (*simplicity*) Most common outcome of last alert notification (*usefulness*)
22. Do you maintain an outbreak alert log or register at the central level? (*Ask to see it*) YES/NO	Percentage of respondents with alert log (*data quality*)
23. What interventions or control measures have been implemented based on data from EWARN?	(*usefulness*)

Question	Indicator
24. Do you (or EWARN staff you supervise) have the following resources for alerts and outbreak investigation (*read each resource to the respondent and determine yes or no*): a. Specimen collection tools YES/NO b. Communication equipment YES/NO c. Adequate funding YES/NO d. Adequate staffing YES/NO e. Transportation (specify): ..... YES/NO f. Other (specify):	Percentage of respondents without resources (specify resource}for alert and outbreak investigation (*stability*)
IV. Weekly reporting	
25. Do you have the following resources to collect and report data for routine surveillance (*read each resource to the respondent and determine yes or no*): a. Communication equipment YES/NO b. Adequate funding YES/NO c. Adequate staffing YES/NO d. Transportation (specify): ..... YES/NO e. Other (specify):	Percentage of respondents without resources (specify resource) for routine surveillance (*stability*)
26. Is EWARN linked with other surveillance systems (e.g. AFP, measles, malaria, etc.)? YES/NO If yes, explain.	(*simplicity*)
V. Weekly bulletins	
27. Do you think the weekly EWARN bulletins are helpful? YES/NO If yes, why are they helpful (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*)? a. Monitor health trends b. Change in clinical practice c. Community campaign d. Share with stakeholders e. Other (specify): ..... f. If no, why not?	Percentage of respondents who find weekly bulletin helpful (*acceptability, usefulness*) Main reasons weekly bulletins are helpful (acceptability, *usefulness*)

Question	Indicator
28. How could the weekly bulletins be modified to be more useful to you?	Main suggestions for bulletin improvement (*usefulness*)
29. With whom do you share the EWARN bulletins/reports? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anyone else" a couple of times; do not read responses aloud*) a. Surveillance officers b. EWARN staff at health facilities c. nongovernmental organizations d. Non-EWARN health professionals e. Donors f. Laboratory facilities g. Other partners h. Other (specify):	Percentage of respondents who disseminate bulletin and to whom (*acceptability*)
30. How (in what format) do you share these bulletins/reports? (*Circle all that apply; do not read responses aloud*) a. WhatsApp or other messenger b. Email c. Post online/internet d. Paper copy e. Verbal summary f. Other (specify):	Most common method of dissemination (*acceptability*)
VI. System maintenance	
31. Have there been any changes to EWARN requirements or needs in the past ..... (*specify evaluation period, e.g. 3 months*)? YES/NO If yes, describe the changes. (*Circle all that apply; do not read responses aloud*). a. Changes in case definitions b. Health events added/removed c. Reporting units added/removed d. Surveillance staff added/removed e. Other (specify):	Main EWARN changes (*flexibility*)

Question	Indicator
31a. How did the change affect the system?	*(flexibility)*
32. Who is funding the system?	*(stability)*
33. Is there funding for the next 12 months?	*(stability)*
34. How have changes to funding effected EWARN?	*(stability)*
35. Has EWARN expanded within the country since it was first implemented? YES/NO If yes, please describe the process. ..... How has the expansion of EWARN affected the following aspects: a. Timeliness of data b. Completeness of data c. Ability to detect and respond to outbreaks d. Overall utility of EWARN	*(flexibility)*
VII. Conclusion	
36. What do you find most interesting or useful about EWARN? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. Monitor health trends b. Detect outbreaks early c. Provide information to donors d. Share information with partners e. Know what is going on in various geographic areas f. Other (specify):	Most common likes (*acceptability, usefulness*)

Question	Indicator
37. What are the most challenging parts of EWARN? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. Not enough training b. Not enough funding c. No commitment from higher authority d. Communication problems e. No response for alerts or outbreaks f. Other (specify):	Most common challenges (*acceptability, usefulness*)
38. Do you have any suggestions to improve or update EWARN?	Most common suggestions (*usefulness*)

Surveillance officer questionnaire

The surveillance officer questionnaire should be used to interview EWARN focal points or public health officials in charge of surveillance at sub-central levels. The purpose of this questionnaire is to understand:

- how the system functions;
- linkages to existing surveillance systems;
- data flow and responsible parties for each component of data flow.

Indicators that may be calculated from responses are provided next to the question in the "Indicator" column. See Appendix 7 for example calculations.

Name of state/province/district: .....

Name/ID number of staff: .....

Name of interviewer: .....

Date of interview (dd/mm/yy): .....

Surveillance officer questionnaire

Question	Indicator
I. General	
1. What is your title?	
2. How many months have you been part of EWARN? a. In your current position: ..... b. Total:	Average time in current position *(stability)* Average total time working on EWARN *(stability)*
3. Did you participate in the implementation of EWARN in your province/district? YES/NO If no, skip to Q 6.	

Question	Indicator
4. How long did it take to implement EWARN in your "area"? ..... 4a. What were the barriers to implementation?	Time from initiation to roll-out *(timeliness)* Main barriers *(stability)*
5. Which component (weekly reporting or outbreak detection and response) was more difficult to implement? ..... What were some constraints or challenges to implementing weekly reporting? ..... What were some constraints or challenges to implementing outbreak detection and response?	Percentage of respondents who report weekly surveillance is harder to implement than outbreak detection and response *(simplicity, acceptability)* Main reasons for difference in ease of implementation *(acceptability, stability)*
6. In your opinion, what is the primary purpose of EWARN?	Primary purpose(s) of EWARN according to respondents *(acceptability, usefulness)*
7. What are your primary responsibilities now (all responsibilities, not only EWARN)? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. EWARN only i. Data review ii. Data compilation/aggregation iii. Data entry iv. Data review v. Data analysis and interpretation vi. Alert/outbreak investigation vii. Other (specify): ..... b. Other non-EWARN related duties (specify):	Main EWARN-related activities of respondents Percentage of respondents with additional responsibilities outside of EWARN *(simplicity, acceptability)*

Question	Indicator
8. How many EWARN reporting sites are you responsible for?	Average number of reporting sites per surveillance officer *(simplicity)*
9. How many of the reporting sites you are responsible for could not be accessed in the last 8 weeks? ..... If ≥1, ask why? (*Circle all that apply; do not read responses aloud*) a. Transportation b. Communication issues (equipment not functioning) c. Security d. Power issues e. Other (specify):	Percentage of inaccessible reporting sites per surveillance officer *(stability)* Main reasons reporting sites are inaccessible *(stability)*
10. Have there been any interruptions to reporting from any of these sites (delays or no reports) in the past 6 months? YES/NO If yes, why? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. Security concerns b. Communications issues (equipment not functioning) c. Funding issues d. Unavailability of forms e. Other (specify): ..... f. No delays	Percentage of surveillance officers reporting delays or late reporting *(timeliness)* Primary reasons for delayed reporting *(timeliness)*
11. Approximately what percentage (%) of reporting sites that provide data to you have been functioning (able to see patients without disruption/closures) within the last ..... (*specify evaluation period, e.g. 3 months*)?	Percentage of health facilities regularly functioning within the last 6 months *(stability)*
II. Supervision, feedback and training	
12. How many of the total sites you are responsible for have you visited in the last 4 weeks? ..... In the last 8 weeks? ..... If none, skip to Q14	Percentage of reporting sites visited in previous 4 weeks *(data quality)* Percentage of reporting sites visited in previous 8 weeks *(data quality)*

Question	Indicator
13. Why did you visit these reporting sites? (*Circle all that apply; do not read responses aloud*) a. Regular supervision b. Provide feedback c. Training d. Outbreak investigation e. Collect reporting form f. Other (specify):	Main reasons for supervisory visits *(data quality)*
14. How often do you provide supervision to reporting site staff? a. Daily b. Weekly c. Monthly d. Unable to provide supervision à skip to Q16 e. Other (specify):	Frequency of supervision of reporting site staff *(data quality)*
15. How do you provide supervision to reporting site staff? (C*ircle all that apply; do not read responses aloud*) a. Via Skype/Viber/WhatsApp/Facebook messenger/etc. b. Email c. Cell phone d. Landline e. Facility visit: date of last visit: ..... f. Workshops/trainings g. Unable to provide supervision h. Other (specify):	Main method of supervision *(data quality)*

Question	Indicator
16. Do you review the weekly reporting form? YES/NO If yes, what do you review? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. Missing data b. Large variations in numbers c. Unusual or new diseases d. Other (specify): ..... What do you do if you find something wrong? ..... If you do not review the weekly reporting form, why not?	Percentage of surveillance officers who review weekly reporting form *(data quality)* Main reasons for review and action *(data quality)*
17. How often do you provide feedback to reporting site staff on data collected for EWARN? a. Daily b. Weekly c. Monthly d. Unable to provide feedback à skip to Q19 e. Other (specify):	Frequency of feedback to reporting site staff on EWARN data *(data quality)*
18. How do you provide feedback to reporting site staff? (*Circle all that apply; do not read responses aloud*) a. Via Skype/Viber/WhatsApp/Facebook messenger/etc. b. Email c. Cell phone d. Landline e. Facility visit: date of last visit: ..... f. Workshops/trainings g. Unable to provide supervision h. Other (specify):	Main method of feedback *(data quality)*

Question	Indicator
19. Do you hold regular meetings with **EWARN reporting site staff**? YES/NO If **no**, why not? ..... à (skip to Q20) If **yes**, how often? a. Daily b. Weekly c. Monthly d. Other (specify):	Percentage of surveillance officers with regular meetings with EWARN reporting site staff *(acceptability)* Frequency of meetings *(acceptability)*
19a. How are the meetings conducted? (*Circle all that apply; do not read responses aloud*) a. Via Skype/WhatsApp/etc. b. Cell phone c. Landline d. In person (specify location):	Primary method of meeting *(acceptability)*
19b. What topics are discussed? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. Strengthen practices b. Training refresher c. Progress since last meeting d. Solicit feedback e. Outbreak investigation and response f. Other (specify):	Primary topics discussed in meetings *(acceptability, usefulness)*
20. Do you have regular meetings with Ministry of Health/WHO EWARN central administrators? YES/NO If **no**, why not? ..... à skip to Q21 If **yes**, how often? a. Daily b. Weekly c. Monthly d. Other (specify):	Percentage of surveillance officers with regular meetings with ministry of health / WHO administrators *(acceptability)* Frequency of meetings *(acceptability)*

Question	Indicator
20a. How are the meetings conducted? (*Circle all that apply; do not read responses aloud*) a. Via Skype/WhatsApp/etc. b. Cell phone c. Landline d. In person (specify location):	Primary method of meeting *(acceptability)*
20b. What topics are discussed? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. Strengthen practices b. Training refresher c. Progress since last meeting d. Solicit feedback e. Outbreak investigation and response f. Other (specify):	Primary topics discussed in meetings *(acceptability, usefulness)*
21. Can you tell me about the most recent EWARN training you received? a. Not able to provide information (*Circle one, skip to Q22*): Did not receive training/don't remember b. Date: ..... c. Duration: ..... (days) d. Conducted by: ..... e. Venue: ..... f. Topics covered (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*): i. Case definitions ii. Outbreak investigation iii. Data analysis iv. Specimen collection v. Form completion vi. Case management vii. Preparedness viii. Other (specify):	Average duration of training *(data quality)* Conducted by *(frequency, data quality)* Most common topics covered *(data quality)* Percentage of respondents not trained *(data quality)*

Question	Indicator
22. Have any new sites under your supervision been added to EWARN in the past 6 months? YES/NO If yes, what was the process of training new partners/staff in EWARN?	Number of new sites added to EWARN *(flexibility)* Process of training new staff *(simplicity, data quality)*
III. Outbreak detection and response	
23. Of the EWARN priority conditions, which illness(es) require immediate reporting (instead of waiting until the end of the reporting period)? *(Only circle respondent's answers and record number correct; ask, "Is there anything else" a couple of times; do not read responses aloud)* **To be modified based on system** a. Suspected cholera b. Acute watery diarrhoea c. Acute bloody diarrhoea d. Suspected measles e. Suspected meningitis f. Acute jaundice syndrome g. Malaria h. Neonatal tetanus i. Influenza-like illness j. AFP k. Viral haemorrhagic fever l. Other (specify):	Percentage of surveillance officers who can correctly report all immediately reportable conditions *(data quality)* Average number of immediately reportable conditions surveillance officers are able to correctly report *(data quality)* Percentage of surveillance officers who cannot report any immediately reportable conditions *(data quality)*
24. Can you tell me what an alert is?	*(data quality)*
25. What is the EWARN surveillance case definition for measles? Knows case definition YES/NO	Percentage of surveillance officers who can correctly report case definitions *(data quality)*
26. What is the EWARN alert threshold for measles? Knows alert threshold YES/NO	Percentage of surveillance officers who can correctly report alert thresholds *(data quality)*

Question	Indicator
27. What is the EWARN surveillance case definition for AFP? Knows case definition YES/NO	Percentage of surveillance officers who can correctly report case definitions *(data quality)*
28. What is the EWARN alert threshold for AFP? Knows alert threshold YES/NO	Percentage of surveillance officers who can correctly report alert thresholds *(data quality)*
29. What do you do if an alert threshold has been exceeded or crossed?	Percentage of surveillance officers who can correctly explain alert notification procedure *(data quality)*
30. How are you notified of alerts in areas where EWARN is implemented? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. EWARN data/bulletins b. Surveillance staff/ EWARN reporting channels c. Health facility staff d. nongovernmental organizations e. Community (e.g. community leaders, community health workers, members, etc.) f. Media g. Other (specify):	Main alert notification method *(simplicity)*
31. What was the last alert notification you received (include disease and date)? ..... a. How were you notified? ..... b. What was the outcome?	Most frequent diseases of last alert notification *(usefulness)* Most common method of last alert notification *(simplicity)* Most common outcome of last alert notification *(usefulness)*

Question	Indicator
32. Do you maintain an outbreak alert log or register? (*Ask to see it*) YES/NO	Percentage of respondents with alert log *(data quality)*
33. Are you involved in alert verification? YES/NO If yes, explain the last alert verification you participated in.	Percentage of surveillance officers involved in alert verification *(timeliness)*
34. Are you involved in outbreak investigation? YES/NO If yes, explain the last outbreak investigation you participated in. *(If respondent frequently participates in outbreak investigations, complete the rapid response team questionnaire)*	Percentage of surveillance officers involved in outbreak investigation *(timeliness)*
35. Do you have the following resources for alert and outbreak investigation (*read each resource to the respondent and determine yes or no*): a. Alert report forms and registers YES/NO b. Specimen collection tools YES/NO c. Communication equipment YES/NO d. Transportation (specify): ..... YES/NO e. Other (specify):	Percentage of respondents without resources (… specify resource) for alert and outbreak investigation *(stability)*
36. What laboratories do the reporting sites you supervise use? What is the process of finding out a positive or negative laboratory result for a suspected outbreak?	*(timeliness, data quality, usefulness)*
IV. Weekly reporting	
37. Do you have the following resources to collect and report data for weekly reporting (*read each resource to the respondent and determine yes or no*): a. Tally sheets and/or weekly reporting forms YES/NO b. Communication equipment YES/NO c. Transportation (specify): ..... YES/NO d. Other (specify):	Percentage of respondents without resources (…specify resource) for weekly surveillance *(stability)*

Question	Indicator
V. System maintenance	
38. Have there been any changes to EWARN since you started working with EWARN? YES/NO If no, skip to Q36 (*If yes, circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. Changes in case definitions b. Conditions added/removed c. Reporting sites added/removed d. Other (specify):	Main EWARN changes identified *(flexibility)*
38a. When was the most recent change to EWARN? ..... How did it occur? What was the outcome?	*(flexibility)*
39. Is EWARN linked with other surveillance systems (e.g. AFP, measles, etc.)? YES/NO If yes, provide examples.	*(simplicity)*
VI. Weekly bulletins	
40. Do you receive the weekly EWARN bulletins? YES/NO If no, skip to Q45.	Percentage of respondents that receive the weekly bulletins *(acceptability, usefulness)*
41. How many of the last four weekly bulletins have you received?	Percentage of surveillance officers who have received the last four bulletins *(acceptability, usefulness)*

Question	Indicator
42. If you have received any, do you think the weekly bulletins are helpful? YES/NO If yes, why are they helpful? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. Monitor health trends b. Change in clinical practice c. Community campaign d. Share with stakeholders e. Other (specify):	Percentage of surveillance officers who find weekly bulletin helpful *(acceptability, usefulness)* Main reasons weekly bulletins are helpful *(acceptability, usefulness)*
43. Could the weekly bulletins be modified to be more useful to you? YES/NO If yes, explain.	Main suggestions for bulletin improvement *(usefulness)*
44. Do you share the EWARN bulletins/reports with anyone else? YES/NO If no, skip to Q45. If yes, to whom? (*Circle all that apply; ask, "Is there anyone else" a couple of times; do not read responses aloud*). a. Other surveillance officers b. EWARN staff at health facilities c. Nongovernmental organizations d. Non-EWARN health professionals e. Donors f. Laboratory facilities g. Other partners h. Other (specify): ..... If yes, in what format? (*Circle all that apply; do not read responses aloud*) a. WhatsApp or other messenger b. Email c. Post online/internet d. Paper copy e. Verbal summary f. Other (specify):	Percentage of surveillance officers who disseminate bulletin *(acceptability)* Most common group with whom surveillance officers share the bulletin *(acceptability)* Most common method of dissemination *(acceptability)*

Question	Indicator
VII. Conclusion	
45. What do you find most interesting or useful about EWARN? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. Monitor health trends b. Detect outbreaks early c. Provide information to donors d. Share information with partners e. Know what is going on in various geographic areas f. Other (specify):	Most common likes *(acceptability, usefulness)*
46. What are the most challenging parts of EWARN? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. Not enough training b. Not enough funding c. No commitment from higher authority d. Communication problems e. No response for alerts or outbreaks f. Other (specify):	Most common dislikes *(acceptability, usefulness)*
47. What additional training would you like to receive?	Most common training requested *(acceptability, usefulness, data quality)*
48. Do you have any suggestions to improve or update EWARN?	Most common suggestions *(usefulness)*

Data manager questionnaire

The data manager questionnaire should be used to interview the data manager at all relevant administrative levels. The purpose of this questionnaire is to understand:

- how data are managed (entered, cleaned, analysed);
- how the system maintains and improves data quality;
- linkages to existing surveillance systems.

Indicators that may be calculated from responses are provided next to the question in the "Indicator" column. See Appendix 7 for example calculations.

Name of state/province/district: .....

Name/ID number of staff .....

Name of interviewer: .....

Date of interview (dd/mm/yy): .....

Data manager questionnaire

Question	Indicator
I. General	
1. What is your title?	
2. How many months have you been part of EWARN? a. In your current position: ..... b. Total:	Average time in current position *(stability)* Average total time working on EWARN *(stability)*
3. In your opinion, what is the primary purpose of EWARN?	Primary purpose(s) of EWARN according to respondents *(acceptability, usefulness)*

Question	Indicator
4. What are your primary responsibilities now (all responsibilities, not only EWARN)? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. EWARN only i. Data compilation/aggregation ii. Data entry iii. Data review iv. Data analysis and interpretation v. Produce weekly bulletins vi. Other (specify): ..... b. Other non-EWARN related duties (specify):	Main EWARN-related activities of respondents Percentage of respondents with additional responsibilities outside of EWARN *(simplicity, acceptability)*
II. Weekly surveillance	
5. Describe the process of data entry and compilation. What resources are used? Who enters the data? What software or format is used (i.e., paper, electronic entry, database)?	*(simplicity)*
6. If responsibilities do not include reviewing or cleaning data, skip to Q10: What is the process for cleaning data?	*(data quality)*
7. Does the database have automatic checks? YES/NO What is your process for checking unusual or unexpected numbers? What do you do if there is anything unusual or unexpected?	*(data quality)*

Question	Indicator
8. What do you do with forms with missing data or blanks?	*(data quality)*
9. What do you do with forms that are submitted late?	*(simplicity)*
10. Do you ever identify and report an immediately notifiable condition or unusual finding that has not already been reported? *(Outbreak detection and response)* If yes, whom do you report to? What is the process of passing on that information? Can you describe the most recent example of an immediately notifiable condition you reported?	*(simplicity, data quality, usefulness)*
11. How are the data stored? Do you back up the data?	*(simplicity)*
12. If responsibilities do not include data analysis, skip to Q13: Which software do you use? How often do you analyse the data? What do you do with the results?	*(simplicity)*
13. Do other surveillance systems exist (e.g. AFP, measles, etc.)? YES/NO If yes, are they compiled with EWARN data? How?	*(simplicity)*
14. If responsibilities do not include producing weekly epi bulletins, skip to Q15: How long does it take you from start to finish to generate an EWARN bulletin (enter, clean and analyse data, and write the bulletin)? Who reviews the bulletin before it is disseminated?	*(simplicity)*

Question	Indicator
15. Do you have the following resources to do data management for EWARN (*read each resource to the respondent and determine yes or no*): a. Computer/software for database management and analysis YES/NO b. Communication equipment YES/NO c. Transportation (specify): ..... YES/NO d. Other (specify):	Percentage of respondents without resources (… specify resource) for data management *(stability)*
III. Training	
16. Can you tell me about the most recent EWARN training you received? a. Not able to provide information (*Circle one, skip to Q17*): Did not receive training/don't remember b. Date: ..... c. Duration: ..... (days) d. Conducted by: ..... e. Venue: ..... f. Topics covered (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*): i. Data management ii. Data analysis iii. Form completion iv. Other (specify): ..... *If the topics did not include data management or data analysis ask:* Have you ever received training on data management or analysis for EWARN? YES/NO	Average duration of training *(data quality)* Conducted by *(frequency, data quality)* Most common topics covered *(data quality)* Percentage of respondents not trained *(data quality)*

Question	Indicator
IV. Conclusion	
17. What do you find most interesting or useful about EWARN? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. Monitoring health trends b. Detecting outbreaks early c. Providing information to donors d. Sharing information with partners e. Knowing what is going on in various geographic areas f. Other (*specify*):	Most common likes *(acceptability, usefulness)*
18. What are the most challenging parts of EWARN? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. Not enough training b. Not enough funding c. No commitment from higher authority d. Communication problems e. No response for alerts or outbreaks f. Other (*specify*):	Most common challenges *(acceptability, usefulness)*
19. What additional training would you like to receive?	Most common training requested *(acceptability, usefulness, data quality)*
20. Do you have any suggestions to improve or update EWARN?	Most common suggestions *(usefulness)*

Rapid response team questionnaire

The rapid response team questionnaire should be used to interview as many members as possible of the teams participating in outbreak investigation and response. If only one person can be interviewed, it should be the team leader. The purpose of this questionnaire is to understand the:

- alert notification, verification, and outbreak investigation processes.
- indicators that may be calculated from responses are provided next to the question in the "Indicator" column. See Appendix 7 for example calculations.

Name of state/province/district: .....

Name/ID number of staff.....

Name of interviewer: .....

Date of interview (dd/mm/yy): .....

Rapid response team questionnaire

Question	Indicator
I. General	
1. What is your title?	
2. How many members are there in the rapid response/outbreak investigation team and what are their roles?	Average rapid response team size and composition
3. What is your role on the team? ..... a. How many months have you had that role?	Average time in rapid response team position *(stability)*

Question	Indicator
II. Training	
4. Can you tell me about the most recent outbreak investigation training you received? a. Not able to provide information *(Circle one, skip to Q5)*: No training attended/Don't remember b. Date: ..... c. Duration: ..... (days) d. Conducted by: ..... e. Venue: ..... f. Topics covered (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*): i. Case definitions ii. Form completion iii. Outbreak investigation iv. Specimen collection v. Control measures vi. Report writing vii. Other (specify):	Percentage of rapid response team members trained in previous 6 months *(data quality)* Average duration of training *(data quality)* Conducted by *(frequency, data quality)* Topics covered *(frequency, data quality)*
III. Outbreak detection and response	
5. How are you usually notified of alerts or potential outbreaks? (*Ask person to explain who notifies him/her; ask, "Is there anyone else" a couple of times; do not read responses aloud*) a. EWARN (surveillance officer or health staff) b. Community (e.g. community leaders, community health workers, members, etc.) c. Local health authority d. Nongovernmental organizations e. Other (specify):	Main alert notification method *(simplicity)*
6. Do you maintain an outbreak alert log or register? (*Ask to see it*) YES/NO	Percentage of respondents with alert log *(data quality)*

Question	Indicator
7. Is there a formal notification system in place with specific people assigned to ensure rapid notification of an alert? YES/NO If yes, describe.	*(simplicity)*
8. Can you walk me through the process once you receive the alert to final determination?	*(simplicity)*
9. Have you identified any alerts from the weekly EWARN bulletins? For example, ones that were not reported to you or your team. YES/NO If yes, when was the last time and what was it?	Percentage of rapid response team who receive alerts from weekly bulletins *(usefulness)*
10. What was the last outbreak you responded to? a. Suspected disease ..... b. How were you notified? ..... c. What was the outcome/response?	Most frequent diseases last responded to *(usefulness)* Most common method of alert notification *(simplicity)* Most common outcome of last outbreak response *(usefulness)*
11. Are there times when you are unable to respond/investigate? YES/NO If yes, explain.	Main reasons why rapid response team members are unable to respond/ investigate *(stability)*
12. If you are unable to respond/investigate, do you provide training to reporting site staff so they can verify an alert in your absence? YES/NO If yes, when was the last training you conducted? To whom? On what topic? If no, why not?	Trained staff for alternative alert verification *(data quality, stability)*

Question	Indicator
13. If you are unable to respond/investigate, do you provide training to reporting site staff so they can conduct an investigation in your absence? If yes, when was the last training you conducted? To whom? On what topic? If no, why not?	Trained staff for alternative investigation *(data quality, stability)*
14. Do you have a response plan for each immediately notifiable condition? YES/NO If yes, list each disease .... Can I see each plan? ..... (*Verify location of response plan or ask for it to be sent if done remotely*) When was the last time it was updated? .... When was the last time it was used or referred to?	Percentage of priority conditions for which a response plan is available *(simplicity)*
15. Do you have the following resources for alert and outbreak investigation (*read each resource to the respondent and determine yes or no*): a. Case investigation report forms YES/NO b. Specimen collection tools i. Cold chain YES/NO ii. Specimen containers YES/NO iii. Specimen forms YES/NO iv. Personal protection (gloves, others if needed) YES/NO v. Rapid diagnostic tests (if applicable) YES/NO vi. Sharps containers (if applicable) YES/NO c. Communication equipment YES/NO d. Transportation (specify): ..... YES/NO e. Other (specify):	Percentage of respondents without resources (… specify resource) for alert and outbreak investigation *(stability)*

Question	Indicator
16. Do you have input to the EWARN weekly bulletins? YES/NO If yes, how? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. Reporting verified alerts b. Writing outbreak investigation reports c. Summarizing control measures d. Other (specify):	Main contributions of rapid response team to weekly bulletins (*usefulness*)
IV. Conclusion	
17. What facilitates your work to respond to alerts and outbreak investigation?	Most common likes of alert verification/ investigation (*acceptability, usefulness*)
18. What are some challenges and constraints to rapid response investigations and how do you overcome them?	Most common challenges and suggestions (*acceptability, usefulness*)
19. What additional training would you like to receive?	Most common training requested *(acceptability, usefulness, data quality)*

Reporting site staff questionnaire

The reporting site staff questionnaire should be used to interview staff at facilities that support and provide data to EWARN (i.e., clinic managers, clinicians, administrators). The purpose of this questionnaire is to understand:

- amount of time devoted to EWARN,
- familiarity with EWARN components and content,
- familiarity with EWARN overlap with other reporting requirements.

Indicators that may be calculated from responses are provided next to the question in the "Indicator" column. See Appendix 7 for example calculations.

Name of state/province/district: .....

Name/ID number of staff: .....

Name of interviewer: .....

Date of interview (dd/mm/yy): .....

Reporting site staff questionnaire

Question	Indicator
I. General	
1. What is your title?	
2. How many months have you been involved with EWARN? a. In your current position: ..... b. Total:	Average time in current position (*stability*) Average total time working on EWARN (*stability*)
3. In your opinion, what is the primary purpose of EWARN?	Primary purpose(s) of EWARN according to respondents (*acceptability, usefulness*)

Question	Indicator
4. What are your primary responsibilities? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. EWARN only i. Data compilation/aggregation ii. Data entry iii. Data review iv. Data analysis and interpretation v. Alert/outbreak investigation vi. Other (specify): ..... b. Other non-EWARN related duties	Main EWARN-related activities of respondents Percentage of respondents with additional responsibilities outside of EWARN (*simplicity, acceptability*)
5. How many hours per week do you spend on EWARN-related tasks?	Average time of respondents spent on EWARN-related tasks (*simplicity, acceptability*)
6. Do you have other reporting or surveillance requirements? YES/NO If yes, explain.	Percentage of respondents with other reporting requirements (*simplicity*)
7. How does EWARN complement or duplicate any other surveillance system requirements?	(*acceptability, simplicity*)
8. Who do you go to if there are questions related to EWARN?	Percentage of respondents who have or know EWARN supervisor (*acceptability, data quality, usefulness*)

Question	Indicator
9. Have there been any interruptions to reporting (delays or no reports) in the past 6 months? YES/NO If yes, why? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. Security concerns b. Communications issues (equipment not functioning) c. Funding issues d. Unavailability of forms e. Other (specify): ..... f. No delays	Percentage of respondents reporting delays or late reporting (*timeliness*) Primary reasons for delayed reporting (*timeliness*)
10. Are there any groups or subgroups in your catchment area not included in EWARN (e.g. groups that face sociocultural, political, geographical barriers that may limit health care access)? YES/NO If yes, explain. Where do they seek health care?	Percentage of respondents reporting systematic exclusion of groups/ individuals (*representativeness*)
II. Supervision, feedback and training	
11. How often do you receive supervision for EWARN? a. Daily b. Weekly c. Monthly d. Do not receive supervision à *skip to Q15* e. Other (specify):	Average frequency of supervisory visits on EWARN (*acceptability, data quality*)
12. How do you receive supervision? (*Circle all that apply; do not read responses aloud*) a. Via Skype/Viber/WhatsApp/Facebook messenger/etc. b. Email c. Cell phone d. Landline e. Facility visit: date of last visit: ..... f. Workshops/trainings g. Other (specify):	Main method(s) of supervision (*simplicity*)

Question	Indicator
13. When was the last time you received a supervisory visit at this health facility?	Average time since last supervisory visit (*acceptability, data quality*)
14. What was the purpose of this visit? (*Circle all that apply; do not read responses aloud*) a. Strengthen practices b. Training refresher c. Progress d. Solicit feedback e. Outbreaks f. Collect EWARN forms/data g. Other (specify): ..... 14a. Who conducted the visit?	Main purpose(s) of most recent supervisory visit Primary person responsible for most recent supervisory visit (*acceptability, data quality*)
15. How often do you receive feedback on data collected for EWARN? a. Daily b. Weekly c. Monthly d. Do not receive feedback à *skip to Q18* e. Other (specify):	Average frequency of feedback on EWARN data (*acceptability, data quality*)
16. How do you receive feedback? (*Circle all that apply; do not read responses aloud*) a. Via Skype/Viber/WhatsApp/Facebook messenger/etc. b. Email c. Cell phone d. Landline e. Facility visit: date of last visit: ..... f. Workshops/trainings g. Other (specify):	Main method(s) of feedback (*simplicity, data quality*)

Question	Indicator
17. When was the last time you received feedback on EWARN data collected for this facility?	Average time since last feedback (*acceptability, data quality*)
18. a. Do you have <u>regular</u> meetings with EWARN staff (surveillance officers, other health staff, etc.)? YES/NO If **no**, why not? ..... *skip to Q19* If **yes**, how often? a. Daily b. Weekly c. Monthly d. Other (specify):	Percentage of regular meetings with EWARN staff Frequency of meetings (*acceptability, data quality*)
18b. How are the meetings conducted? (*Circle all that apply; do not read responses aloud*) a. Via Skype/WhatsApp/etc. b. Cell phone c. Landline d. In person (specify location):	Primary method of meeting (*acceptability*)
18c. What topics are discussed? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. Strengthen practices b. Training refresher c. Progress since last meeting d. Solicit feedback e. Outbreak investigation and response f. Other (specify):	Most common topics discussed in meetings (*acceptability, data quality*)

Question	Indicator
19. How often do you (your reporting site staff) receive EWARN trainings? (*Circle all that apply; do not read responses aloud*): a. Regularly (specify frequency): ..... b. When new staff join c. Sporadically (depending on time, access, funds, etc.) d. No additional training since initial training e. Never trained à *skip to Q21* f. Other (specify):	Frequency of EWARN training (*data quality*)
20. Can you tell me about the most recent EWARN training you received? a. Not able to provide information *(Circle one, skip to Q21)*: No training attended /don't remember b. Date: ..... c. Duration: ..... (days) d. Provided by: ..... e. Venue: ..... f. Topics covered (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*): i. Case definitions ii. Outbreak investigation iii. Data analysis iv. Specimen collection v. Form completion vi. Other (specify):	Percentage of respondents trained in EWARN in previous 6 months Average duration of most recent training Primary facilitators of most recent training Most common topics covered Percentage of respondents not trained in EWARN (*data quality*)
21. Have any new staff been added at your reporting site in the past 6 months who participate in EWARN activities? YES/NO (*If yes, note names of new staff and follow-up with staff to confirm participation*)	Percentage of new staff trained within last 6 months (*data quality*)

Question	Indicator
III. Outbreak detection and response	
22. Of the EWARN priority conditions, which condition(s) require immediate reporting (instead of waiting until the end of the reporting period)? *(Only circle respondent's answers and record number correct; ask, "Is there anything else" a couple of times; do not read responses aloud).* **To be modified based on system** a. Suspected cholera b. Acute bloody diarrhoea c. Suspected measles d. Suspected meningitis e. Acute jaundice syndrome f. Malaria g. Neonatal tetanus h. Influenza-like illness i. AFP j. Viral haemorrhagic fever k. Other (specify)	Percentage of respondents who can correctly report all immediately reportable conditions Average number of immediately reportable conditions respondents are able to correctly report Percentage of respondents who cannot report any immediately reportable conditions (*data quality*)
23. Can you tell me what an alert is?	(*data quality*)
24. What is the EWARN surveillance case definition for measles? Knows case definition YES/NO	Percentage of surveillance officers who can correctly report case definitions (*data quality*)
25. What is the EWARN alert threshold for measles? Knows alert threshold YES/NO	Percentage of surveillance officers who can correctly report alert thresholds (*data quality*)
26. What is the EWARN surveillance case definition for AFP? Knows case definition YES/NO	Percentage of surveillance officers who can correctly report case definitions (*data quality*)

Question	Indicator
27. What is the EWARN alert threshold for AFP? Knows alert threshold YES/NO	Percentage of surveillance officers who can correctly report alert thresholds (*data quality*)
28. What do you do if an alert threshold has been exceeded or crossed?	Percentage of respondents who can correctly explain alert notification procedure (*acceptability, usefulness*)
29. What was the last alert notification you reported (include disease and date)? a. How did you send the notification? b. What was the outcome?	Most frequent diseases of last alert notification (*usefulness*) Most common method of last alert notification (*simplicity*) Most common outcome of last alert notification (*usefulness*)
30. Are you involved in alert verification (i.e. to determine whether the alert is true or a false alarm)? YES/NO/SOMETIMES If yes or sometimes, explain the last alert verification you participated in.	Percentage of respondents involved in alert verification (*simplicity*)
31. Are you involved in outbreak investigations? YES/NO/SOMETIMES If yes, explain the last outbreak investigation you participated in. (*If respondent frequently participates in outbreak investigations, complete rapid response team questionnaire)*	Percentage of respondents involved in outbreak investigations (*simplicity*)
32. Do you maintain an outbreak alert log or register at this facility? (*Ask to see it*) YES/NO	Percentage of respondents with alert log at reporting site (*data quality*)

Question	Indicator
33. What is the process of finding out a positive or negative laboratory result for a suspected outbreak?	Percentage of respondents who receive feedback on laboratory results (*acceptability, data quality, usefulness*)
34. Is there a method to update cases in the register or data collection form when you receive laboratory results?	Percentage of respondents who have systematic method to update records (*data quality*)
35. Do you have the following resources for alert and outbreak investigation (*read each resource to the respondent and determine yes or no*): a. Alert report forms and registers YES/NO b. Specimen collection tools YES/NO Note any specific conditions for which collection tools are missing: ..... c. Communication equipment YES/NO d. Transportation (specify): ..... YES/NO e. Other (specify): ..... f. Not applicable/not involved in alert and outbreak investigations	Percentage of respondents without resources (… specify resource) for alert and outbreak investigation (*stability*)
IV. Weekly surveillance	
36. Do you have the following resources to collect and report data for weekly surveillance (*read each resource to the respondent and determine yes or no*): a. Patient registers YES/NO b. Tally sheets and/or weekly reporting forms YES/NO c. Communication equipment YES/NO d. Transportation (specify): ..... YES/NO e. Other (specify):	Percentage of respondents without resources (…specify resource) for weekly surveillance (*stability*)

Question		Indicator
V. Weekly bulletins		
37. Do you receive the weekly EWARN bulletins? If no, skip to Q41.	YES/NO	Percentage of respondents that receive the weekly bulletins (*acceptability, usefulness*)
38. How many of the last four weekly bulletins have you received?		Percentage of respondents who have received the last four bulletins (*acceptability, usefulness*)
39. Do you think the weekly EWARN bulletins are helpful? YES/NO If yes, why is it helpful? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. Monitor health trends b. Change in clinical practice c. Community campaign d. Share with stakeholders e. Other (specify):		Percentage of respondents who find weekly bulletin helpful (*acceptability, usefulness*) Main reasons weekly bulletins are helpful (*acceptability, usefulness*)
40. How could the weekly bulletins be modified to be more useful to you?		Main suggestions for bulletin improvement (*usefulness*)
VI. Conclusion		
41. What do you find most interesting or useful about EWARN? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. Monitor health trends b. Detect outbreaks early c. Provide information to donors d. Share information with partners e. Know what is going on in various geographic areas f. Other (specify):		Most common likes (*acceptability, usefulness*)

Question	Indicator
42. Have any interventions or control measures been implemented based on data from EWARN? YES/NO Explain.	Main control measures/ interventions from EWARN data (*usefulness*)
43. What are the most challenging parts of EWARN? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. Not enough training b. Not enough funding c. No commitment from higher authority d. Communication problems e. No response for alerts or outbreaks f. Other (specify):	Most common dislikes (*acceptability, usefulness*)
44. What additional training would you like to receive?	Most common training requested (*acceptability, usefulness, data quality*)
45. Do you have any suggestions to improve or update EWARN?	Most common suggestions (*usefulness*)

Clinician questionnaire

The clinician questionnaire should be used to interview health care providers (e.g. doctors, nurses, medical assistants) at reporting sites that support and provide data to EWARN. The purpose of this questionnaire is to understand:

- the role of clinicians in EWARN;
- their familiarity with EWARN components and content.

Indicators that may be calculated from responses are provided next to the question in the "Indicator" column. See Appendix 7 for example calculations.

Name of state/province/district: .....

Name/ID number of staff: .....

Name of interviewer: .....

Date of interview (dd/mm/yy): .....

Clinician questionnaire

Question	Indicator
I. General	
1. What is your title?	
2. How many months have you been working as a clinician? a. At this site: ..... b. Total:	Average time in current position (*stability*) Average total time working on EWARN (*stability*)
3. What are your primary responsibilities? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. Clinical care b. Disease surveillance activities c. Alert/outbreak investigation d. Other non-EWARN related duties (specify): ..... e.	Main activities of respondents Percentage of respondents with additional responsibilities outside of EWARN (*simplicity, acceptability*)

Question	Indicator
4. Are you familiar with EWARN? YES/NO If no, skip to Q9	Percentage of respondents familiar with EWARN (*usefulness*)
5. In your opinion, what is the primary purpose of EWARN?	Primary purpose(s) of EWARN according to respondents (*acceptability, usefulness*)
II. Training	
6. How often do you (and your facility staff) receive EWARN trainings? (*Circle all that apply; do not read responses aloud*) a. Regularly (specify frequency): ..... b. When new staff join c. Sporadically (depending on time, access, funds, etc.) d. No additional training since initial training e. Never trained skip to Q8 f. Other (specify):	Frequency of EWARN training (*data quality*)

Question	Indicator
7. Can you tell me about the most recent EWARN training you received? a. Not able to provide information (Circle one, skip to Q8): b. No training attended/Don't remember c. Date: ..... d. Duration: ..... (days) e. Provided by: ..... f. Venue: ..... g. Topics covered (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*): i. Case definitions ii. Alert thresholds iii. Outbreak investigation iv. Data analysis v. Specimen collection vi. Form completion vii. Other (specify):	Percentage of respondents trained in EWARN in previous 6 months Average duration of most recent training Primary facilitators of most recent training Most common topics covered Percentage of respondents not trained in EWARN (*data quality*)
III. Outbreak detection and response	
8. Of the EWARN priority conditions, which condition(s) require immediate reporting (instead of waiting until the end of the reporting period)? (*Only circle respondent's answers and record number correct, do not read responses aloud*). **To be modified based on system** a. Suspected cholera b. Acute bloody diarrhoea c. Suspected measles d. Suspected meningitis e. Acute jaundice syndrome f. Malaria g. Neonatal tetanus h. Influenza-like illness i. AFP j. Viral haemorrhagic fever k. Other (specify):	Percentage of respondents who can correctly report all immediately reportable conditions Average number of immediately reportable conditions respondents are able to correctly report Percentage of respondents who cannot report any immediately reportable conditions (*data quality*)

Question		Indicator
9. Can you tell me what an alert is?		(*data quality*)
10. What is the surveillance case definition for measles? Knows case definition	YES/NO	Percentage of surveillance officers who can correctly report case definitions (*data quality*)
11. What is the surveillance alert threshold for measles? Knows alert threshold	YES/NO	Percentage of surveillance officers who can correctly report case definitions (*data quality*)
12. What is the surveillance case definition for AFP? Knows case definition	YES/NO	Percentage of surveillance officers who can correctly report case definitions (*data quality*)
13. What is the surveillance alert threshold for AFP? Knows alert threshold	YES/NO	Percentage of surveillance officers who can correctly report alert thresholds (*data quality*)
14. What do you do if you see a condition that requires immediate reporting?		Percentage of respondents who can correctly explain alert notification procedure (*acceptability, usefulness*)

Question	Indicator
15. What was the last alert you reported to surveillance staff (include disease and date)? ..... a. How were you notified (or how did you notify)? ..... b. What was the outcome?	Most frequent diseases of last alert notification (*usefulness*) Most common method of last alert notification (*simplicity*) Most common outcome of last alert notification (*usefulness*)
16. Are you involved in alert verification (i.e. to determine whether the alert is true or a false alarm)? YES/NO/SOMETIMES If yes or sometimes, explain the last alert verification you participated in.	Percentage of respondents involved in alert verification (*simplicity*)
17. Are you involved in outbreak investigations? YES/NO/SOMETIMES If yes, explain the last outbreak investigation you participated in. (*If respondent frequently participates in outbreak investigations, complete rapid response team questionnaire)*	Percentage of respondents involved in outbreak investigations (*simplicity*)
18. What is the process of finding out a positive or negative laboratory result for a suspected outbreak?	Percentage of respondents who receive feedback on laboratory results (*acceptability*)
19. Is there a method to update cases in the register or data collection form when you receive laboratory results?	Percentage of respondents who have systematic method to update records (*data quality*)
IV. Weekly bulletins	
20. Do you receive the weekly EWARN bulletins? YES/NO If no, skip to Q25.	Percentage of respondents that receive the weekly bulletins (*acceptability, usefulness*)

Question	Indicator
21. How many of the last four weekly bulletins have you received?	Percentage of respondents who have received the last four bulletins (*acceptability, usefulness*)
22. Do you think the weekly EWARN bulletins are helpful? YES/NO If yes, why is it helpful? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. Monitor health trends b. Change in clinical practice c. Community campaign d. Share with stakeholders e. Other (specify):	Percentage of respondents who find weekly bulletin helpful (*acceptability, usefulness*) Main reasons weekly bulletins are helpful (*acceptability, usefulness*)
23. How could the weekly bulletins be modified to be more useful to you?	Main suggestions for bulletin improvement (*usefulness*)
V. Conclusion	
24. What do you find most interesting or useful about surveillance? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. Monitor health trends b. Detect outbreaks early c. Provide information to donors d. Share information with partners e. Know what is going on in various geographic areas f. Other (specify):	Most common likes (*acceptability, usefulness*)

Question	Indicator
25. What are the most challenging parts of surveillance? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. Not enough training b. Not enough funding c. No commitment from higher authority d. Communication problems e. No response for alerts or outbreaks f. Other (specify):	Most common challenges (*acceptability, usefulness*)
26. What additional training would you like to receive?	Most common training requested (*acceptability, usefulness, data quality*)
27. Do you have any suggestions to improve or update surveillance?	Most common suggestions (*usefulness*)

Central laboratory questionnaire

The laboratory questionnaire should be used to interview laboratory personnel at central level.

An abridged questionnaire for lower levels is provided in the "Peripheral laboratory questionnaire" below.

Name of agency/site/governorate: .....

Name/ID number of staff: .....

Name of interviewer: .....

Date of interview (dd/mm/yy): .....

Laboratory location: hospital Stand-alone laboratory

Central laboratory questionnaire

Question	Indicator
I. General	
1. What is your title?	
2. What are your primary responsibilities (*Ask technician to explain his/her responsibilities, do not read responses aloud*)? a. Laboratory sample collection b. Conducting laboratory tests on samples c. Recording of results of laboratory tests d. Laboratory quality control e. Laboratory administrative tasks f. Laboratory supervision g. Other laboratory-related duties (specify): ..... h. Other non-laboratory related duties (specify):	
3. What days of the week is the laboratory open (*Circle all that apply*)? Sun Mon Tues Wed Thurs Fri Sat	

Question	Indicator
4. What are the hours of operation? Starting time: ..... ; Ending time:	
5. Is there any capacity for accepting samples after hours? YES/NO	
6. At this laboratory, which types of samples can be tested or which types of tests can be performed?	Priority conditions that can be laboratory-confirmed (*simplicity*)
7. At this laboratory, which types of samples or which tests are expected to be analysed within 24 hours? ..... Within 48 hours?	Samples expected to be analysed within 24 hours Within 48 hours (*timeliness*)
8. Does the laboratory use a standardized reporting form for results? (Ask to see it to verify) YES/NO a. What is the fastest method for reporting results of immediately notifiable conditions? (*Choose one of the following; do not read responses aloud)* i. Email ii. Regular mail iii. Cell phone iv. Landline v. In-person visit from laboratory personnel vi. Centralized database vii. Other (specify): b. Does the laboratory have a written policy for rapid notification of outbreak specimens (e.g. for measles, cholera)? YES/NO (*Ask to see it to verify)*	Use of standardized forms (*data quality*) Method for reporting results of immediately notifiable conditions (*simplicity*)

Question			Indicator
II. Specimen collection (cholera and measles, can be adapted for other priority conditions)			
9. From the prior material reviewed, choose 2 (two) immediately notifiable conditions (i.e. one case is an alert) for which the laboratory tests regularly. If only one immediately notifiable condition is tested regularly, then choose a second condition that requires more than one case to trigger an alert (e.g. suspected shigellosis or bloody diarrhoea). For each test, how many specimens received on the date of ..... (yesterday's date) met the following criteria?			
9a. Specimen information	**Test 1**	**Test 2**	
Name of test/type of specimen	/	/	
No of specimens received			
No. of specimens that had a label with a unique identifier (ID)			Percentage of specimens with a unique ID (*data quality*)
No. of specimens that had adequate material for testing			Percentage of specimens with adequate material for testing (*data quality*)
No. of specimens received in the recommended container, including packaging and temperature			Percentage of specimens in the recommended container (*data quality*)
No. of specimens that had an associated specimen form			Percentage of specimens with specimen form (*data quality*)
No. of specimens in which date and place of specimen collection at collection site was recorded			Percentage of specimens with date and place of specimen collection (*data quality*)

No. of specimens that had all other data entries completed			Percentage of specimens with all other data entries on form completed (*data quality*)
No. of specimens for which receipt time at the laboratory was recorded			Percentage of specimens with receipt time at laboratory recorded (*data quality*)

Question	Indicator
III. Referrals	
10. From the prior material received, choose 2 (two) immediately notifiable conditions for which the laboratory routinely refers to another laboratory for confirmation. What is the expected time from receipt of a sample at your laboratory until you get the results back from the referral laboratory? a. Test 1 (disease/ test/ days): ...../...../..... days b. Test 2 (disease/ test/ and days): ...../...../..... days	Time from specimen arrival to results from referral laboratory (*timeliness*)
11. Do you use a standardized referral form to transfer specimens to another laboratory? (*Ask to see it to verify*) YES/NO a. What is the system in place for tracking specimens from collection to return of results for specimens that are referred (*Ask the technician to explain and ask probing questions where appropriate)*?	Use of standardized forms (*data quality*)

Question			Indicator
IV. Stability/resources			
12. Resources at facility?	Functioning/ adequate?	Monitored/calibrated (give date)	
Refrigerator YES/NO	YES/NO	...../...../.....	Percentage of staff reporting resources for specimen storage and diagnostic testing (*stability*)

Centrifuge	YES/NO	YES/NO	...../...../.....	Percentage of staff reporting resources for specimen storage and diagnostic testing (*stability*)
Balance/scale	YES/NO	YES/NO	...../...../.....	Percentage of staff reporting resources for specimen storage and diagnostic testing (*stability*)
Incubator	YES/NO	YES/NO	...../...../.....	Percentage of staff reporting resources for specimen storage and diagnostic testing (*stability*)
Plates	YES/NO	YES/NO	...../...../.....	Percentage of staff reporting resources for specimen storage and diagnostic testing (*stability*)
Media	YES/NO	YES/NO	...../...../.....	Percentage of staff reporting resources for specimen storage and diagnostic testing (*stability*)
Reagents	YES/NO	YES/NO	...../...../.....	Percentage of staff reporting resources for specimen storage and diagnostic testing (*stability*)
Generator	YES/NO	YES/NO	...../...../.....	Percentage of staff reporting resources for specimen storage and diagnostic testing (*stability*)
Trained and certified for shipping[14]	YES/NO		...../...../..... *(date trained)*	Percentage of staff reporting resources for specimen storage and diagnostic testing (*stability*)
13. What is lacking in the laboratory for effective and efficient sample testing?				(*stability*)

[14] IATA training and certification, https://www.iata.org/training/courses/Pages/dgr-initial-cat-3tcgp13.aspx

Question	Indicator
V. Data quality	
14. Is there a specimen logbook? YES/NO	
14a. If yes, arbitrarily go to 10 different pages of the laboratory register from the last six months and review the following fields: **name, source of specimen, test, result and dates** for legibility and completeness.	

Component	Page										Total	
	1	2	3	4	5	6	7	8	9	10		
Legibility (*if all fields legible give 1, otherwise give 0*)												Legibility of laboratory registers
Completeness (*if all fields complete give 1, otherwise give 0*)												Completeness of laboratory registers

VI. Timeliness

15. Record the date (dd/mm/yy) for 10 arbitrarily chosen samples for the two priority tests used in question 7 above. Then find the number of days for each sample by subtracting the value of Column A from Column B, then subtracting Column B from C, then subtracting C from D, and then subtracting A from D. Add all the results in each column E to H for the total days in each column. Finally, divide by 10 to get the average time for the laboratory for that type of sample.

15a1. Entry for ..... (*specimen name*) **samples for** ..... (*disease test name*)	**A. Date of specimen collection at collection site (dd/mm/yy)**	**B. Date received by laboratory (dd/mm/yy)**	**C. Date test performed (dd/mm/yy)**	**D. Date result reported back to collection site (dd/mm/yy)**
Sample No. 1				
Sample No. 2				
Sample No. 3				
Sample No. 4				
Sample No. 5				

VI. Timeliness

15. Record the date (dd/mm/yy) for 10 arbitrarily chosen samples for the two priority tests used in question 7 above. Then find the number of days for each sample by subtracting the value of Column A from Column B, then subtracting Column B from C, then subtracting C from D, and then subtracting A from D. Add all the results in each column E to H for the total days in each column. Finally, divide by 10 to get the average time for the laboratory for that type of sample.

Sample No. 6				
Sample No. 7				
Sample No. 8				
Sample No. 9				
Sample No. 10				

15a2. ***To be calculated later***

15a2. Entry for ..... samples for	**E. Time from specimen collection to arrival at laboratory (in days), B–A**	**F. Time from receipt to testing (in days), C–B**	**G. Time from testing until result reported to collection site (in days), D–C**	**H. Time from specimen collection until result reported (in days), D–A**
Sample No. 1				
Sample No. 2				
Sample No. 3				
Sample No. 4				
Sample No. 5				
Sample No. 6				
Sample No. 7				
Sample No. 8				
Sample No. 9				
Sample No. 10				
Total days				
Average				

VI. Timeliness

15. Record the date (dd/mm/yy) for 10 arbitrarily chosen samples for the two priority tests used in question 7 above. Then find the number of days for each sample by subtracting the value of Column A from Column B, then subtracting Column B from C, then subtracting C from D, and then subtracting A from D. Add all the results in each column E to H for the total days in each column. Finally, divide by 10 to get the average time for the laboratory for that type of sample.

15b1. Entry for ..... **(specimen name) samples for** ..... **(disease test name)**	**A. Date of specimen collection at collection site (dd/mm/yy)**	**B. Date received by laboratory (dd/mm/yy)**	**C. Date test performed (dd/mm/yy)**	**D. Date result reported back to collection site (dd/mm/yy)**
Sample No. 1				
Sample No. 2				
Sample No. 3				
Sample No. 4				
Sample No. 5				
Sample No. 6				
Sample No. 7				
Sample No. 8				
Sample No. 9				
Sample No. 10				

15b2. ***To be calculated later***

15b2. Entry for ..... **samples for**	**E. Time from specimen collection to arrival at laboratory (days), B–A**	**F. Time from receipt to testing (days), C–B**	**G. Time from testing until result reported to collection site (days), D–C**	**H. Time from specimen collection until result reported (days), D–A**
Sample No. 1				
Sample No. 2				
Sample No. 3				
Sample No. 4				

VI. Timeliness

15. Record the date (dd/mm/yy) for 10 arbitrarily chosen samples for the two priority tests used in question 7 above. Then find the number of days for each sample by subtracting the value of Column A from Column B, then subtracting Column B from C, then subtracting C from D, and then subtracting A from D. Add all the results in each column E to H for the total days in each column. Finally, divide by 10 to get the average time for the laboratory for that type of sample.

Sample No. 5				
Sample No. 6				
Sample No. 7				
Sample No. 8				
Sample No. 9				
Sample No. 10				
Total hours				
Average				

VII. Diagnostics (*see the Excel spreadsheet "Lab Worksheet EWARN EMRO", which can be accessed at www.emro.who.int/pandemic-epidemic-diseases/information-resources/index.html. The following indicators are in the spreadsheet: diagnostic tests for which SOPs are available (data quality) and diagnostic tests for which quality control is performed.*)

Peripheral laboratory questionnaire

The laboratory questionnaire should be used to interview laboratory personnel at peripheral laboratories.

Name of agency/site/governorate: .....

Name/ID number of staff: .....

Name of interviewer: .....

Date of interview (dd/mm/yy): .....

Laboratory location:

☐ Hospital Health post Health centre (clinic)

☐ Mobile Other medical point

Peripheral laboratory questionnaire

Question	Indicator
I. General	
1. What is your title?	
2. What are your primary responsibilities (Ask technician to explain his/her responsibilities, do not read responses aloud)? a. Laboratory sample collection b. Conducting laboratory tests on samples c. Recording of results of laboratory tests d. Laboratory quality control e. Laboratory administrative tasks f. Laboratory supervision g. Other laboratory-related duties (specify): ..... h. Other non-laboratory related duties (specify):	
3. What days of the week is the laboratory open (*Circle all that apply*)? Sun Mon Tues Wed Thurs Fri Sat	

Question	Indicator
4. What are the hours of operation? Starting time: ..... ; Ending time:	
5. Is there any capacity for accepting samples after hours? YES/NO	
6. At this laboratory, which types of samples can be tested or which types of tests can be performed?	Priority conditions that can be laboratory-confirmed (*simplicity*)
7. At this laboratory, which types of samples or which tests are expected to be analysed within 24 hours? ..... Within 48 hours?	Samples expected to be analysed within 24 hours Within 48 hours (*timeliness*)
8. Does the laboratory use a standardized reporting form for results? (*Ask to see it to verify*) YES/NO a. What is the fastest method for reporting results of immediately notifiable conditions? (*Choose one of the following; do not read responses aloud*) i. Email ii. Regular mail iii. Cell phone iv. Landline v. In-person visit from laboratory personnel vi. Centralized database vii. Other (specify): b. Does the laboratory have a written policy for rapid notification of outbreak specimens (e.g. for measles, cholera)? YES/NO (*Ask to see it to verify)*	Use of standardized forms (*data quality*) Method for reporting results of immediately notifiable conditions (*simplicity*)

Question			Indicator
II. Specimen collection (cholera and measles, can be adapted for other priority conditions)			
9. From the prior material reviewed, choose 1 (one) or 2 (two) tests that are immediate priority conditions for which the laboratory tests regularly. If none, then include one that requires more than one case, such as malaria. For each, the specimens received on the date of ..... (yesterday's date), how many met the following criteria?			
9a. Specimen information	**Test 1**	**Test 2 (may not have)**	
Name of test/type of specimen	/	/	
No of specimens received			
No. of specimens that had a label with a unique identifier (ID)			Percentage of specimens with a unique ID (*data quality*)
No. of specimens that had adequate material for testing			Percentage of specimens with adequate material for testing (*data quality*)
No. of specimens received in the recommended container, including packaging and temperature			Percentage of specimens in the recommended container (*data quality*)
No. of specimens that had an associated specimen form			Percentage of specimens with specimen form (*data quality*)
No. of specimens in which date and place of specimen collection at collection site was recorded			Percentage of specimens with date and place of specimen collection (*data quality*)
No. of specimens that had all other data entries completed			Percentage of specimens with all other data entries on form completed (*data quality*)

No. of specimens for which receipt time at the laboratory was recorded	Percentage of specimens with receipt time at laboratory recorded (*data quality*)

III. Referrals

10. From the prior material received, choose 2 (two) immediately notifiable conditions for which the laboratory routinely refers to another laboratory for confirmation. What is the expected time from receipt of a sample at your laboratory until you get the results back from the referral laboratory? IF NONE referred, skip to question 10.

    a. Test 1 (disease/test/days): ..... /..... /..... days

    b. Test 2 (disease/test/days): ..... /..... /..... days

11. Do you use a standardized referral form to transfer specimens to another laboratory? *Ask to see it to verify.* YES/NO

    a. What is the system in place for tracking specimens from collection to return of results for specimens that are referred? (*Ask the technician to explain and ask probing questions where appropriate)*

IV. Stability/resources

12. Resources at facility?	Functioning/ adequate?	Monitored/calibrated *(give date)*
Refrigerator YES/NO	YES/NO	..... /..... /.....
Centrifuge YES/NO	YES/NO	..... /..... /.....
Balance/scale YES/NO	YES/NO	..... /..... /.....
Incubator YES/NO	YES/NO	..... /..... /.....
Reagents YES/NO	YES/NO	..... /..... /.....
Generator YES/NO	YES/NO	..... /..... /.....
Trained and certified for shipping[15] YES/NO		..... /..... /..... *(date trained)*

13. What is lacking in the laboratory for effective and efficient sample testing?

    .....

    .....

[15] IATA training and certification, https://www.iata.org/training/courses/Pages/dgr-initial-cat-3tcgp13.aspx

V. Data quality

14. Is there a specimen logbook? YES/NO

14a. If yes, arbitrarily go to 10 different pages of the laboratory register from the last six months and review the following fields: **name, source of specimen, test, result and dates** for legibility and completeness.

	P 1	P 2	P 3	P 4	P 5	P 6	P 7	P 8	P 9	P 10	Total
Legibility *(if all fields legible give 1; otherwise give 0)*											
Completeness *(if all fields complete give 1, otherwise give 0)*											

VI. Timeliness

15. Record the date (dd/mm/yy) for 10 arbitrarily chosen samples for the two priority tests used in question 7 above.
IF NONE, then include one that requires more than one case, such as malaria.
Then find the number of days for each sample by subtracting the value of Column A from Column B, then subtracting Column B from C, then subtracting C from D, and then subtracting A from D. Add all the results in each column E to H for the total days in each column. Finally, divide by 10 to get the average time for the laboratory for that type of sample.

15a1. Entry for ..... (*specimen name*) **samples for** ..... (*disease test name*)	**A. Date of specimen collection at collection site (dd/mm/yy)**	**B. Date received by laboratory (dd/mm/yy)**	**C. Date test performed (dd/mm/yy)**	**D. Date result reported back to collection site (dd/mm/yy)**
Sample No. 1				
Sample No. 2				
Sample No. 3				
Sample No. 4				
Sample No. 5				
Sample No. 6				

VI. Timeliness

15. Record the date (dd/mm/yy) for 10 arbitrarily chosen samples for the two priority tests used in question 7 above.
IF NONE, then include one that requires more than one case, such as malaria.
Then find the number of days for each sample by subtracting the value of Column A from Column B, then subtracting Column B from C, then subtracting C from D, and then subtracting A from D. Add all the results in each column E to H for the total days in each column. Finally, divide by 10 to get the average time for the laboratory for that type of sample.

15a1. Entry for ..... (*specimen name*) **samples for** ..... (*disease test name*)	**A. Date of specimen collection at collection site (dd/mm/yy)**	**B. Date received by laboratory (dd/mm/yy)**	**C. Date test performed (dd/mm/yy)**	**D. Date result reported back to collection site (dd/mm/yy)**
Sample No. 7				
Sample No. 8				
Sample No. 9				
Sample No. 10				

15a2. ***To be calculated later***

15a2. Entry for ..... **samples for**	**E. Time from specimen collection to arrival at laboratory (in days), B–A**	**F. Time from receipt to testing (in days), C–B**	**G. Time from testing until result reported to collection site (in days), D-C**	**H. Time from specimen collection until result reported (in days), D–A**
Sample No. 1				
Sample No. 2				
Sample No. 3				
Sample No. 4				
Sample No. 5				
Sample No. 6				
Sample No. 7				
Sample No. 8				
Sample No. 9				

VI. Timeliness

15. Record the date (dd/mm/yy) for 10 arbitrarily chosen samples for the two priority tests used in question 7 above.
IF NONE, then include one that requires more than one case, such as malaria.
Then find the number of days for each sample by subtracting the value of Column A from Column B, then subtracting Column B from C, then subtracting C from D, and then subtracting A from D. Add all the results in each column E to H for the total days in each column. Finally, divide by 10 to get the average time for the laboratory for that type of sample.

15a1. Entry for ..... (*specimen name*) **samples for** ..... (*disease test name*)	**A. Date of specimen collection at collection site (dd/mm/yy)**	**B. Date received by laboratory (dd/mm/yy)**	**C. Date test performed (dd/mm/yy)**	**D. Date result reported back to collection site (dd/mm/yy)**
Sample No. 10				
Total days				
Average				

15b1. Entry for ..... **samples for** ..... **(***provide specimen and test 2***)**	**A. Date of specimen collection at collection site (dd/mm/yy)**	**B. Date received by laboratory (dd/mm/yy)**	**C. Date test performed (dd/mm/yy)**	**D. Date result reported back to collection site (dd/mm/yy)**
Sample No. 1				
Sample No. 2				
Sample No. 3				
Sample No. 4				
Sample No. 5				
Sample No. 6				
Sample No. 7				
Sample No. 8				
Sample No. 9				
Sample No. 10				

VI. Timeliness

15. Record the date (dd/mm/yy) for 10 arbitrarily chosen samples for the two priority tests used in question 7 above.
IF NONE, then include one that requires more than one case, such as malaria.
Then find the number of days for each sample by subtracting the value of Column A from Column B, then subtracting Column B from C, then subtracting C from D, and then subtracting A from D. Add all the results in each column E to H for the total days in each column. Finally, divide by 10 to get the average time for the laboratory for that type of sample.

15a1. Entry for ..... (*specimen name*) **samples for** ..... (*disease test name*)	**A. Date of specimen collection at collection site (dd/mm/yy)**	**B. Date received by laboratory (dd/mm/yy)**	**C. Date test performed (dd/mm/yy)**	**D. Date result reported back to collection site (dd/mm/yy)**

15b2. *To be calculated later*

15b2. Entry for ..... **samples for**	**E. Time from collection of specimen to arrival at laboratory (days), B–A**	**F. Time from receipt to testing (days), C–B**	**G. Time from testing until result reported to collection site (days), D–C**	**H. Time from collection of specimen until result reported (days), D–A**
Sample No. 1				
Sample No. 2				
Sample No. 3				
Sample No. 4				
Sample No. 5				
Sample No. 6				
Sample No. 7				
Sample No. 8				
Sample No. 9				
Sample No. 10				
Total hours				
Average				

VII. Diagnostics (*See the Introduction sheet in the Excel spreadsheet "Lab Worksheet EWARN EMRO" for explanation of requested information. This can be accessed at www.emro.who.int/pandemic-epidemic-diseases/information-resources/index.html . The following indicators are in the spreadsheet: diagnostic tests for which SOPs are available (data quality) and diagnostic tests for which quality control is performed.*)

16. Enter all relevant tests performed in the laboratory (one test/line) and provide requested details for each test
    Possible answers (unless otherwise advised): 1.Yes; 2.Partial; 3.No; 4.Non applicable

Test type/ name	**Specimen type**	**Method(s) and instrument(s)**	**Frequency**	**Staff**	**SOPs**	**Supplies**	**Internal quality control**			**Score per test**
			Average number of tests performed monthly	When staff last trained (months; put 0 if not trained)	Is SOP available for this test?	Are they in date (not expired)?	Are internal quality control specimens included when performing this test?	Are internal quality control results acceptable?	Are corrective actions implemented if internal quality control results are not acceptable?	
Example										
Cytobacteriological examination of urine	Urine	Yes	45	6	1	2	3	4	4	
Diarrhoeal diseases										
Rapid diagnostic test for cholera										
Rapid diagnostic test for Shiga toxin										
Rapid diagnostic test for *S. typhi* (Tubex)										
Microscopic examination for ova and parasites										
Other										

Meningitis										
Gram stain from CSF sediment for *N. meningitidis*, Hib, *S. pneumoniae* detection										
Other										
Acute jaundice syndrome (AJS)										
Rapid diagnostic test for hepatitis A										
Rapid diagnostic test for hepatitis E										
Rapid diagnostic test for HBsAg										
Urine dipstick for urobilinogen										
Other										
Vector-borne diseases										
Blood stain of for malaria species (Giemsa, Wright)										
Rapid diagnostic test for malaria										
Specimen stain of for Leishmania (H&E, Giemsa, special)										
Rapid diagnostic test for dengue										
Other										
Comments:										

Note: SOP = standard operating procedure.

CSF = cerebrospinal fluid.

Health partner (supporting EWARN) questionnaire

The health partner questionnaire should be used to interview staff of partner organizations supporting health facilities that participate in EWARN (e.g. medical coordinators, project officers, etc.). The purpose of this questionnaire is to understand if partners find EWARN simple, acceptable and useful.

Indicators that may be calculated from responses are provided next to the question in the "Indicator" column. See Appendix 7 for example calculations.

Name of state/province/district: .....

Name/ID number of staff: .....

Name of interviewer: .....

Date of interview (dd/mm/yy): .....

Health partner (supporting EWARN) questionnaire

Question	Indicator
I. General	
1. What is your title?	
2. How many months have you been involved with EWARN? a. In your current position: ..... b. Total:	Average time in current position (*stability*) Average total time working on EWARN (*stability*)
3. In your opinion, what is the primary purpose of EWARN?	Primary purpose(s) of EWARN according to respondents (*acceptability, usefulness*)

Question	Indicator
4. What are your primary responsibilities? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. EWARN only b. Data compilation/aggregation c. Data entry d. Data review e. Data analysis and interpretation f. Alert/outbreak investigation g. Other (specify): ..... h. Other non-EWARN related duties	Main EWARN-related activities of respondents Percentage of respondents with additional responsibilities outside of EWARN (*simplicity, acceptability*)
5. How many hours per week do you spend on EWARN-related tasks?	Average time of respondents spent on EWARN-related tasks (*simplicity, acceptability*)
6. How many facilities does your agency/organization support? ..... How many of these facilities report to EWARN?	Average number of health facilities supported by partners (*simplicity*) Average number of reporting sites supported by partners (*simplicity*)
7. How many of the facilities your agency/organization is supports cannot be accessed? ..... If ≥1, ask why? (*Circle all that apply; do not read responses aloud*) a. Transportation b. Communication issues (equipment not functioning) c. Security d. Power issues e. Other (specify):	Percentage of inaccessible reporting sites per surveillance officer (*stability*) Main reasons reporting sites are inaccessible (*stability*)

Question	Indicator
8. How are decisions made about adding new facilities? For example, how do you add new health units or remove (non-functioning, closed, etc.)?	(*simplicity, stability*)
9. Are there any groups or subgroups in your catchment area(s) that face barriers (e.g. sociocultural, political or geographical) that may limit health care access? YES/NO If yes, explain. Where do they seek health care?	Percentage of respondents reporting systematic exclusion of groups/ individuals (*representativeness*)
10. What other reporting or surveillance requirements does your agency/organization have? (*Determine whether there are duplicate reporting requirements with EWARN.*)	Percentage of respondents with other reporting requirements (*simplicity*)
II. Feedback and training	
11. a. Do you have regular meetings with Ministry of Health /WHO EWARN central administrators? YES/NO If **no**, why not? ..... à *skip to Q12* If **yes**, how often? a. Daily b. Weekly c. Monthly d. Other (specify):.....	Percentage of regular meetings with EWARN staff Frequency of meetings (*acceptability, data quality*)
11b. How are the meetings conducted? (*Circle all that apply; do not read responses aloud*) e. Via Skype/WhatsApp/etc. f. Cell phone g. Landline h. In person (specify location):	Primary method of meeting (*acceptability*)

Question	Indicator
11c. What topics are discussed? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) i. Strengthen practices j. Training refresher k. Progress since last meeting l. Solicit feedback m. Outbreak investigation and response n. Other (specify):	Most common topics discussed in meetings (*acceptability, data quality*)
12. How often do your agency/organization staff receive EWARN trainings? (*Circle all that apply; do not read responses aloud*) a. Regularly (specify frequency): ..... b. When new staff join c. Sporadically (depending on time, access, funds, etc.) d. No additional training since initial training e. Never trained à *skip to Q14* f. Other (specify):	Frequency of EWARN training (*data quality*)
13. Can you tell me about the most recent EWARN training your agency/organization staff received? a. Not able to provide information (*circle one, skip to Q14*): No training attended/don't remember b. Date: ..... c. Duration: ..... (days) d. Provided by: ..... e. Venue: ..... f. Topics covered (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*): i. Case definitions ii. Outbreak investigation iii. Data analysis iv. Specimen collection v. Form completion vi. Other (specify):	Percentage of respondents trained in EWARN in previous 6 months Average duration of most recent training Primary facilitators of most recent training Most common topics covered Percentage of respondents not trained in EWARN (*data quality*)

Question	Indicator
III. Outbreak detection and response	
14. Can you tell me what an alert is?	(*data quality*)
15. How are you (your agency/organization) notified of an alert? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. EWARN data/ bulletins b. Surveillance staff/ EWARN reporting channels c. Health facility staff d. Community (e.g. community leaders, community health workers, members, etc.) e. Media f. Other (specify):	Main alert notification method (*simplicity*)
16. What was the last alert notification you received (include disease and date)? a. How were you notified? ..... b. What was the outcome?	Most frequent diseases of last alert notification (*usefulness*) Most common method of last alert notification (*simplicity*) Most common outcome of last alert notification (*usefulness*)
17. Have any interventions or control measures been implemented based on data from EWARN? YES/NO Explain	Main control measures/ interventions from EWARN data (*usefulness*)
18. Is your agency/organization involved in alert verification (i.e. to determine whether the alert is true or a false alarm)? YES/NO/SOMETIMES If yes or sometimes, explain the last alert verification your agency/organization participated in.	Percentage of respondents involved in alert verification (*simplicity*)

Question	Indicator
19. Is your agency/organization involved in outbreak investigations? YES/NO/SOMETIMES If yes, explain the last outbreak investigation your agency/organization participated in. If respondent frequently participates in outbreak investigations, complete rapid response team questionnaire.	Percentage of respondents involved in outbreak investigations (*simplicity*)
20. Does your agency/organization have the following resources for alert and outbreak investigation (*read each resource to the respondent and determine yes or no*): Alert report forms and registers YES/NO Specimen collection tools YES/NO Note any specific conditions for which collection tools are missing: ..... Communication equipment YES/NO Transportation (specify): ..... YES/NO Other (specify): ..... Not applicable/not involved in alert and outbreak investigations	Percentage of respondents without resources (…specify resource) for alert and outbreak investigation (*stability*)
IV. Weekly surveillance	
21. Does your agency/organization have the following resources to collect and report data for weekly surveillance (*read each resource to the respondent and determine yes or no*): Patient registers YES/NO Tally sheets and/or weekly reporting forms YES/NO Communication equipment YES/NO Transportation (specify): ..... YES/NO Other (specify):	Percentage of respondents without resources (…specify resource) for weekly surveillance (*stability*)
V. Weekly bulletins	
22. Do you receive the weekly EWARN bulletins? YES/NO If no, skip to Q26.	Percentage of respondents that receive the weekly bulletins (*acceptability, usefulness*)

Question	Indicator
23. How many of the last 4 weekly bulletins have you received?	Percentage of respondents who have received the last 4 bulletins (*acceptability, usefulness*)
24. Do you think the weekly EWARN bulletins are helpful? YES/NO If yes, why is it helpful? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. Monitor health trends b. Change in clinical practice c. Community campaign d. Share with stakeholders e. Other (specify):	Percentage of respondents who find weekly bulletin helpful (*acceptability, usefulness*) Main reasons weekly bulletins are helpful (*acceptability, usefulness*)
25. How could the weekly bulletins be modified to be more useful to you?	Main suggestions for bulletin improvement (*usefulness*)
VI. Conclusion	
26. What do you find most interesting or useful about EWARN? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. Monitor health trends b. Detect outbreaks early c. Provide information to donors d. Share information with partners e. Know what is going on in various geographic areas f. Other (specify):	Most common likes (*acceptability, usefulness*)

Question	Indicator
27. What are the most challenging parts of EWARN? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. Not enough training b. Not enough funding c. No commitment from higher authority d. Communication problems e. No response for alerts or outbreaks f. Other (specify):	Most common dislikes (*acceptability, usefulness*)
28. What additional training would you like to receive?	Most common training requested (*acceptability, usefulness, data quality*)
29. Do you have any suggestions to improve or update EWARN?	Most common suggestions (*usefulness*)

Community questionnaire

The community questionnaire should be used to interview community health workers (CHW) or leaders in areas served by EWARN facilities who may provide informal reporting of alerts to EWARN. The purpose of this questionnaire is to understand:

- the role of community health workers or community leaders in relation to EWARN;
- community health workers' familiarity with EWARN components and content;
- EWARN's overlap with other reporting requirements.

Indicators that may be calculated from responses are provided next to the question in the "Indicator" column. See Appendix 7 for example calculations.

Name of state/province/district: .....

Name/ID number of interviewee: .....

Name of interviewer: .....

Date of interview (dd/mm/yy): .....

Community questionnaire

Question	Indicator
I. General	
1. What is your title/role? ..... a. Time in months in your current position: ..... b. Total time in months in community:	Average time in current position (*stability*) Average total time in community (*stability*)
2. What are your primary responsibilities?	
3. What area(s) are you responsible for (catchment area or population)?	(*representativeness*)

Question	Indicator
4. How often do you visit these households/communities? a. Daily b. Weekly c. Monthly d. Don't know/not sure e. Other (specify):	
5. Are there any areas or groups which you cannot visit or are unable to access? ..... If yes, why? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. Transportation b. Communication issues (equipment not functioning) c. Security d. Power issues e. Other (specify):	Percentage of inaccessible areas per community respondent (*representativeness*) Main reasons areas are inaccessible (*stability*)
6. What are the main health conditions that you see among the population/area you cover?	(*representativeness*)
7. Can you tell me about the most recent training you received related to infectious disease? a. Not able to provide information *(Circle one, skip to Q8)*: No training attended/Don't remember b. Date: ..... c. Duration: ..... (days) d. Conducted by: ..... e. Venue: ..... f. Topics covered (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*): i. Diagnosis ii. Case definitions iii. Outbreak investigation iv. Specimen collection v. Form completion vi. Other (specify):	Percentage of community respondents trained in previous 6 months (*data quality*) Average duration of training (*data quality*) Conducted by (*frequency, data quality*) Topics covered (*frequency, data quality*)

Question	Indicator
8. Are you familiar with EWARN? YES/NO If no, skip to Q10.	Percentage of community respondents familiar with EWARN (*acceptability*)
9. If yes, in your opinion, what is the primary purpose of EWARN?	Primary purpose of EWARN according to community respondents (*acceptability, usefulness*)
II. Outbreak detection and response	
10. Can you tell me what an alert is?	(*data quality*)
11. Do you know which illness(s) require immediate reporting? *(Circle respondent's answers and record number correct)* **To be modified based on system** a. Suspected cholera b. Acute watery diarrhoea c. Acute bloody diarrhoea d. Suspected measles e. Suspected meningitis f. Acute jaundice syndrome g. Malaria h. Neonatal tetanus i. Influenza-like illness j. AFP k. Viral haemorrhagic fever l. Other (specify):	Percentage of community respondents who can correctly report all immediately reportable conditions (*data quality*) Average number of immediately reportable conditions community respondents are able to correctly report *(data quality)* Percentage of community respondents who cannot report any immediately reportable conditions (*data quality*)
12. What do you do if you hear of or suspect a case of measles?	Percentage of community respondents who can correctly explain alert notification procedure (*data quality*)

Question	Indicator
13. Describe the last alert you reported: a. What was the suspected disease? ..... b. How was it reported? ..... c. To whom was it reported? ..... d. What was the outcome?	Most frequent diseases of last alert notification (*usefulness*) Most common method of last alert notification (*simplicity*) Most common outcome of last alert notification (*usefulness*)
14. Have you been involved in or participated in an alert verification or investigation? YES/NO If yes, explain.	Percentage of respondents involved in alert verification or investigation (*simplicity*)
III. Supervision and feedback	
15. How often do you receive supervision from health staff on the work you do? a. Daily b. Weekly c. Monthly d. Rarely/never e. Don't know/not sure f. Other (specify):	Frequency of supervision (*data quality*)
16. How do you receive supervision? a. Cell phone b. Workshops/trainings c. Individual meetings d. Other (specify):	Main method of supervision (*data quality*)

Question	Indicator
17. How often do you receive feedback from health staff on the work you do? a. Daily b. Weekly c. Monthly d. Rarely/never e. Don't know/not sure f. Other (specify):	Frequency of feedback (*data quality*)
18. How do you receive feedback? a. Cell phone b. Workshops/trainings c. Individual meetings d. Other (specify):	Main method of feedback *(data quality*)
IV. Conclusion	
19. What challenges do you face in reporting alerts? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. Not enough training b. Communication problems c. No response for alerts or outbreaks d. Other (specify):	Most common challenges (*acceptability, usefulness*)
20. What additional training would you like to receive?	Most common training requested (*acceptability, usefulness, data quality*)
21. Do you have any suggestions to improve alert notification or response in the community?	Most common suggestions (*usefulness*)

Health facility (not reporting to EWARN) questionnaire

The health facility questionnaire should be used to interview staff with an organization supporting health facilities that do not regularly participate in EWARN. The purpose of this questionnaire is to understand:

- how partner does infectious disease surveillance;
- how they report alerts and how they find out about potential outbreak detected by EWARN in nearby areas;
- their role in outbreak investigation and response.

Indicators that may be calculated from responses are provided next to the question in the "Indicator" column. See Appendix 7 for example calculations.

Name of state/province/district: .....

Name/ID number of interviewee: .....

Name of interviewer: .....

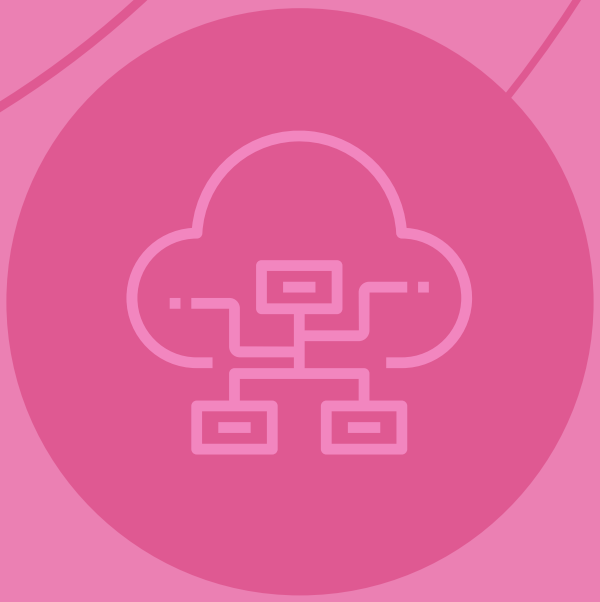
Date of interview (dd/mm/yy): .....

Health facility (not reporting to EWARN) questionnaire

Question	Indicator
I. General	
1. What is your title?	
II. Outbreak detection and response	
2. How do you hear about immediately notifiable conditions? (*Circle all that apply; ask person to tell you about the topics, ask, "Is there anything else" a couple of times; do not read responses aloud*) a. Health cluster meetings b. Health facility staff c. Surveillance staff d. Community (e.g. community leaders, community health workers, members, etc.) e. Other (specify):	Main alert notification method *(simplicity)*

3. What was the last alert notification you received (include disease and date)? ..... a. How were you notified? ..... b. What was the outcome?	Most frequent diseases of last alert notification (*usefulness*) Most common method of last alert notification *(simplicity)* Most common outcome of last alert notification *(usefulness)*
4. Does your agency/organization assist in outbreak investigations? YES/NO If yes, how? If no, why not? *Skip to Q8.*	Percentage of respondents that participate in outbreak investigations *(simplicity)*
5. Do you have the following resources for alerts and outbreak investigation (*read each resource to the respondent and determine yes or no*): a. Alert report forms and registers YES/NO b. Specimen collection tools YES/NO c. Communication equipment YES/NO d. Transportation (specify): ..... YES/NO e. Other (specify):	Percentage of respondents without resources (… *specify resource*) for alert and outbreak investigation *(stability)*
6. Are you familiar with EWARN? YES/NO If no, skip to Q8	Percentage of non-EWARN respondents familiar with EWARN *(usefulness)*
7. Even though your agency/facility does not participate in EWARN, does your agency/organization receive the weekly EWARN bulletins? YES/NO Does your agency organization use EWARN data? YES/NO If yes, explain how the data are used? If no, why not?	(*usefulness*)

8. Are there any groups or sub-groups in your catchment area(s) that face barriers (e.g. sociocultural, political, or geographical) that may limit health care access)? YES/NO If yes, explain.	(*representativeness*)
9. Do you have any suggestions to improve alert notification or response in your catchment area(s)?	Most common suggestions *(usefulness)*



Appendix 2

Appendix 2. Document review

Register and report form review

The following information will require a review of documents from various administrative level: patient registers, weekly forms (health facility level) and alert logbook, and central database (provincial/national/central level).

Health facility name: .....

Location: .....

Name of reviewer: .....

Date (dd/mm/yy): .....

Required documents: Health facility: patient register

A. From the **facility patient register**, arbitrarily go to 10 different pages within the 5 selected epidemiologic weeks (epi weeks) and review the following fields: **age, sex, diagnosis, and signs and symptoms** for legibility and completeness.

Question	A1. Legibility If all fields legible give 1; otherwise give 0	A2. Completeness If all fields complete give 1; otherwise give 0
P 1		
P 2		
P 3		
P 4		
P 5		
P 6		
P 7		
P 8		
P 9		
Total		

Required documents: Health facility: patient register, weekly reporting form

State/district/governorate/national: central database

B1. For weekly surveillance review of the 5 selected epi weeks, select 2 priority conditions that are not immediately notifiable and complete the table below:

1) From the **patient register,** count the total number of cases of each selected condition (review all pages for the 5 epi weeks) and enter into columns 1 below;

2) From the corresponding **facility weekly reporting forms,** enter the total counts for the same selected condition (for all 5 epi weeks) into columns 2 below;

At state/district/governorate/national level,

3) For the same 5 selected epi weeks of the **database,** enter the total counts for the selected condition for each site into columns 3 below.

Note: If no weekly form exists, enter n/a. If weekly form does not include zero reporting (reports '-'instead of 0), indicate no concordance.

Epi week	Condition 1			Condition 2		
	1. Register at facility	2. Weekly form at facility	3. Database at state and/or central location	1. Register at facility	2. Weekly form at facility	3. Database at state and/or central location
Total						

To be calculated later

B2. Record the results of the following calculations based on the information collected in **B1**.

Calculation	Condition 1	Condition 2
Week concordance (i.e. number of weeks that are in agreement among all three sources)		
Percent difference in case counts between facility patient register and weekly reporting forms (total difference in cases between columns 1 and 2, divided by larger total)		
Percent difference in case counts between facility weekly reporting forms and state and/or central database (total difference in cases between columns 2 and 3, divided by larger total)		

Required documents: Health facility: patient register

State/district/governorate/national: alert logbook, central database

C1. For review of alerts from the 5 selected epi weeks, select 2 priority conditions that are immediately notifiable **and** for which alerts have been recorded and complete the table below:

1) From the **patient register,** count the total number of cases of each selected condition (review all pages for the 5 epi weeks) and enter into columns 1 below;

NOTE: At state/district/governorate/national level,

2) From the **alert logbook,** enter the total number of cases for the same selected condition (for all 5 epi weeks) from the selected site and enter into columns 2 below;

3) For the same 5 selected epi weeks of the **database,** enter the total counts for each selected condition from the selected site into columns 3 below.

Epi week	Condition 1:			Condition 2:		
	1. Register at facility	2. Alert log at state and/ or central location	3. Database at state and/or central location	1. Register at facility	. Alert log at state and/or central location	3. Database at state and/or central location
Total						

To be calculated later

C2. Record the results of the following calculations based on the information collected in **C1**.

Calculation	Condition 1	Condition 2
Week concordance (i.e. number of weeks that are in agreement among all three sources)		
Percent difference in alerts between **patient register** and **alert log** (total difference in alerts between columns 1 and 2, divided by larger total)		
Percent difference in alerts between **alert log** and **database** (total difference in alerts between columns 2 and 3, divided by larger total)		

Required documents: Health facility: weekly reporting form

D. Review all fields for the 5 selected epi weeks of the **facility weekly reporting forms** for completeness.

Question	Epi week	Epi week	Epi week	Epi week	Epi week	Total
If all fields **complete**, including zero reporting, give 1; otherwise give 0 NOTE: If a field is left blank, that field should be considered not complete						

Required documents: none (health facility observation)

E. Optional, only if feasible, directly observe health facility staff during patient visits. Review the signs and symptoms presented by the patient and recorded by the staff. Compare the diagnosis with the standardized case definition to calculate the percent of cases complying with the case definition.

No. of patient visits observed	No. of observed diagnoses compliant with case definition	Percent of diagnoses complying with case definition

Alert logbook review

The following information will require a review of the alert logbook at either state/district/governorate/central level.

Location (state/district/governorate): .....

Name of reviewer: .....

Today's date (dd/mm/yy): .....

Required documents: State/district/governorate/national: alert logbook, IHR notifications/records

F1. From the alert logbook, use the table below to collect information from 10 arbitrarily selected entries within the past 6 months.
NOTE: give dates as dd/mm/yy

A. Date of alert notification	B. Suspected disease	C. Primary mode of alert[a]	D. Date of alert verification	E. Date of investigation started and sample collection	F. Date of confirmation/ results received	G. Result (+ve/– ve)	H. Date of follow-up or control measures	I. Date IHR notification made[b] (NA = not applicable (ND = not done)

F1. From the alert logbook, use the table below to collect information from 10 arbitrarily selected entries within the past 6 months.
NOTE: give dates as dd/mm/yy

[a]Formal disease occurrence information originating from the health system; informal-disease occurrence information originating outside the health system, including from members of the public and the media.

[b]Consult with national IHR focal point to determine whether alert was required to be reported via IHR, and if so, when it was reported.

To be calculated later – please see glossary of terms for definitions

F2. Record the results of the following calculations based on the information collected in **F1**.

Calculation	Value
Sensitivity of formal mode of detection (No. of formal alerts, divided by total No. of alerts)	
Sensitivity of informal mode of detection (No. of informal alerts, divided by total No. of alerts)	
Disease-specific sensitivity (indicate disease: .....) (No. of disease outbreaks detected by EWARN, divided by No. of disease outbreaks detected by all systems)	
Overall predictive value positive (PVP) (No. of laboratory-confirmed alerts divided by total No. of alerts/ rumours)	
Disease-specific PVP (indicate disease: .....) (No. of laboratory-confirmed alerts for disease divided by total No. of alerts for disease)	
Average time from alert notification to verification (sum of [D–A] for all alerts divided by total No. of alerts)	
Average time from alert verification to outbreak investigation started (sum of [E–D] for all alerts divided by total No. of alerts)	
Average time from alert investigation to receipt of results (sum of [F–E] for all alerts divided by total No. of alerts)	

Average time from verification to implementation of control measures (sum of [H–E] for all alerts divided by total No. of alerts)	
Percent of alerts investigated within 48 hours of notification, if verified (No. of alerts investigated within 48 hours of verification divided by total No. of alerts)	

Required documents: State/district/governorate/national: database

G1. Review the 5 selected epi weeks in the **state/provincial** and **central database** for any missing data (e.g. number of cases, dates, locations, etc.). Calculate the percentage of missing data based on the number of data fields.

No. of blank data fields	Total No. of data fields (No. of indicators × No. of observations)	Percent missing data

G2. Completeness: Review 5 selected epi weeks in the database for missing reporting sites. Calculate the percent of sites that reported the indicated number of times.

Epi week (list number below)	No. of sites actually reporting	Total No. of sites	Percent of sites reporting
Average (total ÷ 5)			

Required documents: State/district/governorate/national: weekly bulletins

H. Timeliness: Review the **weekly bulletins** for the 5 selected epi weeks to determine the percent of facilities submitting weekly reports by the weekly deadline.

Epi week	No. of sites reporting on time:	Total No. of sites	Percent of sites reporting on time
Average (total ÷ 5)			

Appendix 3

Appendix 3. Supplementary questions

The following tables include supplemental questions, used in previous surveillance evaluation tools[14], which may be asked during the evaluation if additional information beyond the core questions and indicators is desired. They are organized by the attributes to which they apply, the appropriate respondent(s), appropriate indicators, and whether they meet the outbreak detection and response (ODR) and/or weekly surveillance (WS) component of the surveillance system. If a question applies to more than one attribute, the additional attributes are indicated in parentheses after the question.

The respondents are defined below:

- evaluator – individual(s) conducting the evaluation;
- central level staff – staff at the central level of the ministry/agency/organization responsible for EWARN;
- surveillance staff at all levels – staff at all sub-national administrative levels responsible for EWARN-related surveillance activities;
- rapid response team – staff responsible for investigating and responding to alerts and outbreaks;
- health facility level staff – staff at facilities responsible for data collection and reporting;
- nongovernmental organizations/ Ministry of Health supporting health facilities – health or project officer at the organization or agency supporting the health facility;
- data manager at all levels – staff responsible for data management at all administrative levels for EWARN;
- community member– individual(s) monitoring the health status of the community, i.e. community health workers, leaders, liaisons, etc.;

[14] Sudan EWARS 2004, South Sudan EWARN 2009, Sudan EWARS 2009, Pakistan DEWS 2011, South Sudan EWARN 2012, and Somalia Communicable Disease Surveillance and Response 2014

- stakeholders – additional agencies/partners supporting EWARN or utilizing EWARN data including, but not limited to, UN agencies and donors;
- technical lead – technical lead(s) involved in system design and implementation.

Table A3.1. Simplicity

Question	Respondent	ODR	WS
1.1 If the bulletin is available online and they have internet access, ask if they know where it is located and how to access it (*acceptability*)	Health facility-level staff Nongovernmental organizations/ ministry of health supporting health facilities	X	X

Table A3.2. Flexibility

Question	Respondent	ODR	WS
2.1 Determine whether the "user-defined" fields in the EWARN reporting form are used correctly. Arbitrarily select 10 EWARN reporting forms and assess whether the "user-defined" category was used to capture unusual or significant health events not listed in the list of priority conditions. (*data quality*)	Evaluator	X	X

Table A3.3. Data quality

Question	Respondent	ODR	WS
3.1 Describe how original collection and reporting forms are stored at the various administrative levels. If they are not maintained, explain why.	Evaluator	X	X
Training and supervision			
3.2 Have you had enough training to do surveillance reporting adequately? If no, what specific areas would you like more training on?	Surveillance staff at all levels Health facility-level staff	X	X

3.3 Who is selected to attend EWARN trainings? (*simplicity, stability*)	Central level Surveillance staff at all levels Health facility-level staff Nongovernmental organizations/ministry of health supporting health facilities	X	X
3.4 Observation: staff can correctly complete reporting forms	Evaluator	X	X
3.5 What is the purpose of a case definition?	Health facility-level staff	X	X
For immediate reporting			
3.6 How are laboratory results used by the surveillance system? Are changes made to surveillance data based on laboratory results?	Surveillance staff at all levels Health facility-level staff	X	

Table A3.4. Acceptability

Question	Respondent	ODR	WS
4.1 Do you find the data collection system simple?	Central level Surveillance staff at all levels Health facility-level staff Nongovernmental organizations/ministry of health supporting health facilities	X	X
4.2 How reliable do you think the system is when it is (not) showing a problem? (*data quality*)		X	X

Table A3.5. Sensitivity

Question	Respondent	ODR	WS
5.1 Determine whether there have been any artifactual changes? How are these handled?	Evaluator	X	X
5.2 If an outbreak occurs, are ill people likely to come to the clinic? If not, why not?	Surveillance staff at all levels Health facility-level staff Nongovernmental organizations/ministry of health supporting health facilities Community	X	
5.3 Is active surveillance ever done for any disease?	Surveillance staff at all levels Health facility-level staff Nongovernmental organizations/ministry of health supporting health facilities	X	X

Table A3.6. Representativeness

Question	Respondent	ODR	WS
6.1 Is there a mortality register or surveillance system that captures deaths? (*data quality*)	Surveillance staff at all levels Health facility-level staff Nongovernmental organizations/ministry of health supporting health facilities	X	X

Table A3.7. Timeliness

Question	Respondent	ODR	WS
7.1 Is information available to initiate control efforts and prevent continued exposure?	Evaluator	X	
7.2 Is information available to assist programme planning?	Evaluator	X	X

Question	Respondent	ODR	WS
7.3 Are there specific areas or health facilities which do not have timely reporting?	Evaluator		X
7.4 Do agencies regularly share reports or data with the offices or coordinating agency at regional/country level? If yes, in what format are data shared?	Nongovernmental organizations/ministry of health supporting health facilities	X	X

Table A3.8. Stability

Question	Respondent	ODR	WS
8.1 How do you reorder materials such as reporting form, registers, rapid diagnostic test (if applicable)?	Health facility-level staff Nongovernmental organizations/ministry of health supporting health facilities	X	X
8.2 If there is a change in the government, what is the implication for EWARN?	Central level staff Surveillance staff at all levels Nongovernmental organizations/ministry of health supporting health facilities	X	X

Table A3.9. Usefulness

Question	Respondent	ODR	WS
9.1 If applicable, determine whether integration of EWARN into larger surveillance system has improved outbreak detection and response? (*acceptability, simplicity, stability*)	Central level staff Surveillance staff at all levels Nongovernmental organizations/ministry of health supporting health facilities Health facility-level staff	X	
9.2 Are there any public health concerns not captured by the system or reported late? Which ones and why? (*sensitivity, timeliness*)	Central level staff Surveillance staff at all levels Nongovernmental organizations/ministry of health supporting health facilities	X	X

Appendix 4

Appendix 4. Key monitoring indicators

System information may be collected on a routine (e.g. monthly) basis for continued monitoring of the system. Key indicators for early warning surveillance systems include:

- percentage of sites submitting reports on time (i.e. by the weekly deadline);
- percentage of reported alerts verified within 48 hours;
- percentage of outbreaks investigated within 72 hours;
- percentage difference in case counts between the patient register, reporting form and database;
- percentage of unreported alerts;
- percentage of sites receiving routine supervisory visits (specify frequency).

Appendix 5

Appendix 5. Remote evaluation

Due to the changing dynamics of humanitarian emergencies, access to affected areas may be restricted, not possible or change during the evaluation process. Therefore, if an in-country or on-site evaluation is not feasible, conduct the evaluation remotely. While it is recommended to follow the same guidance outlined for the on-site evaluation (i.e. representative site selection, key informant interviews and document review of selected epi weeks), remote evaluation will require some advance planning and flexibility on the part of both the evaluation team and staff being surveilled.

Below are some suggestions and challenges to consider based on recently conducted remote EWARN evaluations[15]. One or several of these options may be applicable, depending on the situation and available resources.

Key informant interviews

- Conduct interviews via telephone, Voice over Internet Protocol (VOIP) such as Skype or Viber, or mobile messaging services such as WhatsApp or MSN Messenger.
- Consider sending an abbreviated version of the questionnaire ahead of time, if possible, as poor call quality may make it difficult to hear.
- Schedule extra time or several appointments per interview as these may take longer or require multiple attempts to complete the interview, especially if telephone interpretation is required.
- Where feasible, train local teams who may have access and who are not directly involved with health-related activities at the site to assist with in-person interviews.
- Distribute self-administered questionnaires via email or with the assistance of partners or third parties who may have access to key informants (not recommended due to potential for bias).

[15] Somalia 2013; Northern Syria 2015; Iraq 2016; Darfur, Sudan 2016.

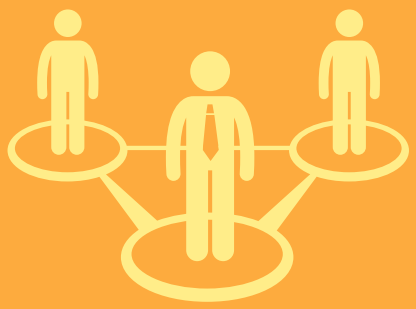
Document/laboratory review

- Obtain copies of relevant documents (patient registers, weekly forms, logbooks, database, etc.) via photocopies or pictures using smartphones; provide examples of desired registers or other documents to describe information you are trying to obtain.
- Obtain hard copies of older health facility/laboratory registers, if time and logistics allow.
- Plan additional time and logistics for transfer of documents – i.e. how to pick-up photocopies or have them delivered, how to scan large files and send via email, etc.
- Where feasible, train local teams who may have access and who are not directly involved with health-related activities at the site to conduct the on-site document review.

Translation

- Using an interpreter is essential when evaluating EWARN systems in different languages, not only for communicating with key personnel but also for the document review component of the evaluation.
- Ensure there are translation services available for the duration of the evaluation, which includes the planning phase (identifying sites, obtaining relevant documents and organizing logistics), the evaluation phase (key informant interviews and document review) and the post-evaluation phase (sharing key findings and recommendations).

It is ideal to have a professional interpreter, but this is not always available or necessary. Based on recent experiences, it is more efficient and helpful to have someone who is familiar with, but not directly involved with EWARN and/or health care, to help with translation. A lot of time may be spent trying to decipher medical terminology or information may be misinterpreted if the interpreter is unfamiliar with basic health or EWARN concepts.



Appendix 6

Appendix 6. Administration and logistics

Complete the following administrative and logistic tasks prior to planning and beginning evaluation.

- ☐ Identify and confirm funding source and available amount.
- ☐ Coordinate evaluation dates.
- ☐ Identify members of the evaluation team.
- ☐ Plan itinerary, including travel to country and accommodation (if applicable).
- ☐ Coordinate transportation within country (if applicable).
- ☐ Ensure necessary resources are available (e.g. work space, computer and internet, telephone, etc.).
- ☐ Determine which materials will need to be printed ahead of time and those which may be printed on site.
- ☐ Address any other logistics or administrative tasks.

Appendix 7

Appendix 7. Data analysis and example calculations

The following indicators should be calculated during data analysis; see below for example calculations.

Key informant interviews

Use the questionnaire templates (Appendix 1) to capture the minimum key information per attribute listed below.

Data quality

- percentage of staff who can correctly identify immediately notifiable diseases
- percentage of staff who accurately provide case definitions
- percentage of staff who accurately provide alert thresholds
- percentage of staff who can correctly explain alert notification procedure
- training:
    - percentage of current surveillance officers trained in EWARN
    - percentage of current EWARN health facility staff trained in EWARN
    - percentage of new EWARN health facility staff (hired within the past 6 months) trained in EWARN
    - percentage of new EWARN partners/reporting sources (added within the past 6 months) trained in EWARN
    - average length of trainings (initial and refresher)

- supervision and feedback:
    - percentage of health facilities which received feedback in previous 4 weeks; in previous 8 weeks
    - percentage of health facilities which received supervisory visits in previous 4 weeks; in previous 8 weeks.

Document review

Use the document review guide Questions A–H (Appendix 2) to capture the minimum key information per attribute listed below.

Data quality

- average score for legibility of patient registers (Question A1)
- average score for completeness of patient registers (Question A2)
- percentage of weeks in agreement for documents reviewed for weekly surveillance (Question B2) and alerts (Question C2)
- percentage difference in case counts for weekly surveillance (Question B2) and alerts (Question C2)
- average score for completeness of weekly reporting forms (Question D)
- percentage of cases complying with the case definition based on observation (if feasible) (Question E)
- percentage of missing fields in the central database (Question G1)
- percentage of sites reporting for selected epi weeks (Question G2)

Sensitivity

- Percent sensitivity of mode of detection (Question F2);
- Percent sensitivity by disease, if feasible (Question F2)

Predictive value positive (PVP) of alerts

- Percent overall PVP (Question F2)
- Percent PVP by disease, if feasible (Question F2)

Timeliness

- Average time from alert notification to verification (Question F2)
- Average time from alert verification to investigation (Question F2)
- Average time from investigation to receipt of results (Question F2)
- Average time from verification to implementation of control measures (Question F2)
- Percentage of alerts investigated within 48 hours (Question F2)
- Percentage of sites reporting by the weekly deadline (Question H)

Laboratory review

Use the laboratory questionnaire (Appendix 1) to calculate the minimum key information per attribute listed below.

Simplicity

- Number of priority conditions that can be laboratory-confirmed

Data quality

- Average score for legibility of laboratory registers (Question 15a)
- Average score for completeness of laboratory registers (Question 15a)
- Number of diagnostic tests for which standard operating procedures are available
- Number of diagnostic tests for which quality control is performed
- Specimen collection
    - Percent received with a label, with a unique identifier (ID) (Question 7a)
    - Percent received with adequate material for testing (Question 7a)
    - Percent received in recommended container, including packaging and temperature (Question 7a)
    - Percent received with associated specimen form (Question 7a)
    - Percent with date and place of specimen collection on form (Question 7a)
    - Percent with all other data entries on form completed (Question 7a)
    - Percent with receipt time at laboratory recorded (Question 7a)

Timeliness

- Average time from specimen collection to arrival in laboratory (Questions 16a and 16b)
- Average time from specimen arrival at laboratory to testing (Questions 16a and 16b)
- Average time from testing until result reported to collection site (Questions 16a and 16b)
- Average time from specimen collection until results reported (Questions 16a and 16b)

Stability

- Percentage of staff reporting adequate resources for specimen storage and diagnostic testing.

Example calculations

These calculations provide examples of how the data are analysed for selected indicators. The remaining indicators should be computed similarly.

1. Percentage of surveillance officers trained in EWARN within previous 6 months

- **Example:** Evaluators interviewed 30 surveillance officers; 27 surveillance officers were able to provide information on EWARN training they had received within the past 6 months. % surveillance officers trained within previous 6 months = (number of surveillance officers trained in previous 6 months)/(total number of surveillance officers interviewed) × 100% surveillance officers trained within previous 6 months = 27/30 × 100 = 90% Thus, an estimated 90% of surveillance officers have received/attended some form of EWARN training within the past 6 months. *Note: additional analysis on type, length, and specific topics of trainings can be further analysed.*

2. Percentage of health facilities which received supervisory visits/feedback within previous 4 weeks [3.5, 3.6]

- **Example:** Information from 4 of the respondents is as follow: Respondent 1 is responsible for 12 facilities and has visited 8 within the past 4 weeks; Respondent 2 is responsible for 10 facilities and has visited 10 within the past 4 weeks; Respondent 3 is responsible for 8 facilities and has visited 7 within the past 4 weeks; Respondent 4 is responsible for 13 facilities and has visited 11 in the past 4 weeks.
    - Percentage health facilities visited in past 4 weeks
      = (No. of facilities visited in past 4 weeks)/(total no. of facilities for which responsible) × 100

- Percentage of health facilities visited in past 4 weeks
  = 8/12 + 10/10 + 7/8 + 11/13 = 3.38
  3.38/4 respondents = 0.85
  0.85 × 100 = 85%

Thus, an estimated 85% of health facilities have been visited by surveillance staff or other staff in supervisory roles within the past 4 weeks.

Note: Compare answers from respondents in supervisory positions with answers from health facility staff.

3. Percentage of missing data in database (i.e. number of cases, epi week, dates, locations, etc.)

- **Example:** Evaluators reviewed 10 arbitrarily selected weeks in the database. There are 20 data fields for each observation. For each week selected there are 38 reporting units. There were 175 data fields missing information.
  - Percentage of missing data = (No. of missing or blank data fields)/[(No. of data fields) × (No. of reporting units) × (10 weeks)] × 100
    Percentage of missing data = [175/(20 × 38 × 10)] × 100 = 2.3%
    Thus the database is missing 2.3% of all possible data.

4. Case number concordance between patient register, weekly reporting form and database

- **Example:** Evaluators selected two priority conditions, suspected cholera and suspected measles, and reviewed data from 10 arbitrarily selected weeks. They counted the total number of cases for each condition in the patient registers and the weekly reports collected from health facilities. These were compared to the numbers in the central database for the corresponding facilities and epidemiological weeks. The information obtained is in the Table A7.1 below.

Table A7.1. Example of information for suspected cholera and measles

Facilities reviewed: 2, 8, 11, 15, 17, 21, 23, 27, 30, 34, 39, 42, 46, 53, 57, 61, 65, 70, 73, 78

Epi weeks reviewed: 27, 30, 33, 35, 39, 41, 44, 47, 48, 51

Disease	No. of cases in registers	No. of cases on reporting forms	No. of cases in database
Suspected cholera	85	123	116
Suspected measles	21	18	37
Total	106	141	153

% difference = (total difference in no. of cases)/(total no. of cases [larger total]) × 100

- % difference between registers and weekly report forms = [(141 – 106)/141] × 100 = 25%
  There is a 25% difference in the case counts between facility registers and reporting forms.
- % difference between registers and database = [(153 – 106)/153] × 100 = 31%
  There is a 31% difference in the case counts between facility registers and the database.
- % difference between weekly report forms and database = [(153 – 141)/153] × 100 = 8%
  There is an 8% difference in the case counts between reporting forms and the database.

5. Percentage of sentinel sites reporting regularly

- **Example:** Evaluators reviewed 10 arbitrarily selected epi weeks in the central database and check for missing reporting units. There are 54 total reporting units. 32 units reported 10 times. 12 units reported 7-9 times. 2 units reported 4-6 times. 8 units reported 3 times or less.
- Percentage of sentinel sites reporting 10 times = 32/54 × 100 = 59%
  An estimated 59% of reporting units report every week.
- Percentage of sentinel sites reporting 7–9 times = 12/54 × 100 = 22%
  An estimated 22% of reporting units report 70–90% of the time.
- Percentage of sentinel sites reporting 4–6 times = 2/54 × 100 = 4%
  An estimated 4% of reporting units report 40–60% of the time.
- Percentage of sentinel sites reporting 3 times or less = 8/54 × 100 = 15%
  An estimated 15% of reporting units report 30% of the time or less.

Table A7.2 is based on a review of the outbreak alert log/register used for the following calculations of sensitivity, PVP and timeliness.

Table A7.2. Example of information on an outbreak alert log/register used for calculating sensitivity, PVP and timeliness

A. Date of alert notification	B. Suspected disease	C. Primary mode of alert	D. Date of alert verification	E. Date of investigation/ sample collection	F. Date of confirmation/ results received	G. Result (+ve/–ve)	H. Date of follow-up or control measures
3 January 2014	Cholera	Formal	3 January 2014	5 January 2014	6 January 2014	+ve	10 January 2014
7 January 2014	Diphtheria	Informal	8 January 2014	12 January 2014	14 January 2014	+ve	16 January 2014
22 January 2014	Shigellosis	Informal	24 January 2014	25 January 2014	28 January 2014	–ve	
12 February 2014	Measles	Informal	12 February 2014	16 February 2014	20 February 2014	+ve	28 February 2014
14 February 2014	Cholera	Informal	15 February 2014	15 February 2014	16 February 2014	+ve	No action taken
17 February 2014	Meningitis	Formal	18 February 2014	18 February 2014 (no sample taken)			
2 March 2014	Malaria	Informal	2 March 2014	3 March 2014	3 March 2014	+ve	7 March 2014
7 March 2014	AFP	Formal	7 March 2014	7 March 2014	10 March 2014	–ve	
8 March 2014	AJS	Formal	12 March 2014	18 March 2014	No results received		
15 March 2014	Measles	Informal	16 March 2014	17 March 2014	18 March 2014	–ve	

6. Percent sensitivity of mode of detection

Example: From the table above, there are a total of 10 alerts – six detected by an informal mode and 4 detected by a formal mode.

Sensitivity of mode of detection = (total no. of alerts detected by mode)/(total no. of alerts by any mode)

- Sensitivity of **formal** detection = (no. of **formal** alerts)/(total no. of alerts) = 4/10 × 100 = 40%
  40% of alerts occurring in the area are detected by formal mode.

Note: *Calculating overall and disease-specific sensitivity may require additional information external to the system to determine the number of true outbreaks in the area for the given time period.*

7. Percent disease-specific alert sensitivity

Example: From Table A7.2 it is noted that one true measles outbreak was detected by EWARN. After discussion with a nongovernmental organization maintaining a separate surveillance system for measles, it has been determined that there were two additional measles outbreaks that were not detected by EWARN. In total, there were three true outbreaks of measles from 3 January 2014 to 15 March 2014.

Disease-specific sensitivity: disease-specific sensitivity may be estimated if an alternate surveillance system exists.

- Disease-specific sensitivity = (No. of disease-specific outbreaks detected by EWARN)/(total no. of true disease outbreaks detected by all systems)
- Measles sensitivity = (No. of measles outbreaks detected by EWARN)/(total no. of true outbreaks detected by all systems) = 1/3 × 100 = 33%
  33% of measles outbreaks occurring in the area are detected by the system.

8. Predictive value positive (PVP) of alerts

Example:

- PVP = (No of laboratory-confirmed alerts)/(total number of alerts with results) = 5/8 × 100 = 63%
  63% of the alerts detected by the system are true outbreaks.

9. Average time from alert notification to investigation

Example: The time from alert to investigation can be determined by subtracting the value in column A from the value in column E. For example, the time from alert to investigation for the first alert is: (5 [January] – 3 [January]) = 2 days. Determine the time from alert to investigation for all alerts and calculate the average. Make a note of any outbreaks that were not investigated.

- Average interval (alert to investigation) = (sum of time from alert to investigation for all alerts)/(total No. of alerts)
- Average interval (alert to investigation) =
  (2+5+3+4+1+1+1+0+10+2)/10 = 29/10 = 2.9 days
  The average time from alert to investigation is 2.9 days or about 70 hours.

Appendix 8

Appendix 8. Evaluation checklist

I. Pre-evaluation preparation and planning

Evaluation component	YES	NO
Review all pertinent documents from initial implementation		
Review templates of data collection and reporting tools		
Review system outputs (epi bulletins, reports, etc.)		
Identify key stakeholders by organization/agency and role within EWARN		
Select facilities to evaluate (and visit, if possible)		
Adapt and pilot evaluation tools		

II. Evaluation

Evaluation component	YES	NO
Describe the emergency/context		
Describe the system		
Initial implementation process and evolution to current status		
Funding and system resources		
Priority conditions under surveillance		
Transition/exit strategy		
Describe system operations		
Data flow		
Human resources		
Describe system attributes for weekly surveillance and outbreak response (see Appendix 6 for key indicators for analysis)		
Is it timely?		
Are the data valid, accurate and reliable?		
Is it acceptable to partners, staff, data users and consumers?		

Evaluation component	YES	NO
Is it simple?		
Is it flexible?		
What existing resources are available and what resources are needed to maintain/improve it?		
Can you determine the sensitivity of EWARN compared to other systems?		
Can you determine the positive predictive value of EWARN?		
Is the system missing certain groups or areas?		
Do the data result in any public health action?		

III. Post-evaluation conclusions and recommendations

Evaluation component	YES	NO
Analysis of indicators		
Results and conclusions for weekly surveillance objective		
Results and conclusions for outbreak detection and response objective		
Overall strengths and weaknesses		
Recommendations for system improvement		
Follow-up recommendations (3 months and 6 months)		

Appendix 9

Appendix 9. Common evaluation findings and causes

Finding	Causes
Poor data quality	non-standardized forms duplicate reporting inconsistent reporting sites or irregularity of reporting no quality assurance practices poor staff knowledge of priority conditions, including case definitions high staff turnover; limited or no training of new staff lack of feedback and supervision high burden of work and/or competing priorities limited laboratory capacity
Barriers to participation	geographic remoteness limited communications, including telephone and internet connectivity security/safety concerns lack of feedback high burden of work limited resources large number of participating organizations limiting flexibility

Finding	Causes
Limited public health action	poor staff knowledge of alert thresholds and reporting procedures alternate reporting channels and involvement of multiple organizations leading to miscommunication/confusion unclear designation of responsibilities for outbreak investigation and response poor data quality limited analysis and interpretation limited laboratory capacity variability in reporting and frequency of laboratory confirmation inadequate training limited supplies, funding and logistical support insufficient guidance to implement control measures

Glossary of terms

Acceptability The willingness of persons to participate in the surveillance system to provide accurate, consistent, complete and timely data, and the end users of the data to accept and use the data generated by the system.

Activities Actions performed to produce specific outputs using a given set of resources.

Alert A signal or early warning that could indicate an outbreak or cluster of an epidemic-prone disease.

Alert threshold The critical number of cases (or indicator, proportion, rate, etc.) that is used to sound an early warning, launch an investigation at the start of an epidemic and prepare to respond to the epidemic.

Alert verification Systematic assessment of the validity of an alert.

Assessment A systematic or non-systematic way of gathering relevant information, analysing and making judgements on the basis of the available information.

Case An instance of a particular disease, chronic condition or type of injury. A variety of criteria may be used to identify cases.

Case definition A set of diagnostic criteria that must be fulfilled in order to identify a case of a particular disease. A surveillance case definition is one that is standardized and used to obtain the accurate detection of all cases of the targeted disease or condition in a given population while excluding the detection of other similar conditions.

Completeness of reporting Proportion of surveillance reports (or forms) received irrespective of when the reports were submitted. Proportion of reports received based on expected reporting units.

Data quality This reflects the completeness and validity of the data captured in EWARN. The acceptability and representativeness of a public health surveillance system are related to data quality.

Early warning system A communicable disease surveillance and response system that is designed to detect as early as possible any departure from the usual or normally-observed frequency or phenomenon.

Effectiveness The capability of the system to produce the desired result(s) and meet system objectives.

Endemic health condition A disease, chronic condition or type of injury that is constantly present in a given geographic area or population group; may also refer to the usual prevalence

of a disease or condition.

Epidemic (*synonym: outbreak*) The occurrence in a community or region of cases of an illness, specific health-related behaviour, or other health-related events in excess of normal expectancy. The community or region and the period in which the cases occur are specified precisely. The number of cases indicating the presence of an epidemic varies according to the agent, size, and type of population exposed, previous experience or lack of exposure to the disease, and time and place of occurrence.

Epidemic-prone disease A disease likely to cause an epidemic or disease outbreak.

Evaluation A process that attempts to determine as systematically and objectively as possible, the relevance, effectiveness and impact of activities in light of the objectives. Several evaluations can be distinguished, e.g. evaluation of structure, process, and outcome.

Flexibility Ability of the surveillance system to adapt to changing information needs or operating conditions (e.g. incorporate new diseases, leave out less important diseases, change reporting frequency, change or modify data source) with little additional time, personnel, or allocated funds. Standard data formats (paper, electronic, both) can be easily integrated and adapted, as necessary.

Formal source Disease occurrence information originating from the health system.

Indicators Variables that measure change over time

Informal source Disease occurrence information originating outside the health system, including from members of the public and the media.

Line list List of cases including relevant patient information (e.g. demographic information and date of onset of disease) used to monitor a suspected or confirmed disease outbreak.

Mode of detection Formal or informal source from which the disease occurrence information or alert originates.

Monitoring of surveillance systems The ongoing tracking and analysis of routine measurements aimed at detecting changes in the surveillance system.

Morbidity Disease; any departure, subjective or objective, from a state of physiological or psychological health and well-being.

Operational efficiency The ability of the system to avoid wasting materials, energy, efforts, money and time while operating to meet system objectives.

Outbreak (*synonym: epidemic*) Because the public sometimes perceives "outbreak" as less sensational than "epidemic", the former is sometimes the preferred word. Sometimes, the

two words are differentiated, with "outbreak" referring to a localized health problem and "epidemic" to one that takes place in a more general area.

Outbreak investigation Actions taken to confirm diagnosis and to verify an outbreak.

Outcomes All possible results that may stem from implementing surveillance and response activities.

Output The immediate result of implementing surveillance and response activities.

Predictive value positive of case definition (PVPcd) Ability of the case definition to identify real cases or the proportion of true cases of the disease that meet the case definition.

Predictive value positive of detecting outbreaks/cases (PVPdo) Ability of the surveillance system to detect real alerts, i.e. confirmed alerts (after verification)/all alerts detected. The proportion of alerts detected by the system that ultimately were determined to constitute an outbreak can be used to characterize the efficiency of the system. In emergencies, the ability to determine if outbreaks occurred may make determining PVP difficult as this requires laboratory confirmation, which might not be available.

Priority diseases Diseases/conditions that have been identified to be of important/major public health concern.

Proportional morbidity The proportion of morbidity in a population attributable to a particular cause over a period of time. Each cause of morbidity is expressed as a percentage of all causes of morbidity, and the sum of proportional morbidity for all causes must equal 100%.

Public health surveillance The systematic and continuing collection, analysis, interpretation and dissemination of health data. The purpose of public health surveillance is to gain knowledge of the patterns of disease, injury and other health problems in a community so as to work towards controlling and preventing them.

Quality assurance The intended or regular actions required to provide enough confidence that a product or service will assure the given requirements.

Reporting unit The primary source of surveillance data; health facilities where patients seek care.

Representativeness Ability of the system to accurately describe the occurrence of a health-related event over time and its distribution in a given population by place and person. An important result of evaluating the representativeness of a surveillance system is the identification of population subgroups that might be systematically excluded from the reporting system through inadequate methods of monitoring.

Sensitivity in surveillance The ability of a surveillance or reporting system to detect true health events, i.e. the ratio of the total number of health events detected by the system to the total number of true health events. The measurement of sensitivity requires a) collection of or access to data usually external to the system to determine the true frequency of the condition in the population under surveillance, and b) validation of the data collected by the system. Often, EWARN is the only surveillance system capturing data on priority health events during a humanitarian emergency and laboratories may not be functioning, therefore, sensitivity is difficult to assess if no "gold standard" data are available.

Sensitivity of case definition Ability of the case definition to detect all cases of the disease targeted for surveillance.

Sensitivity of detection of cases Ability of the surveillance system to detect cases, i.e. proportion of cases of a disease detected by the surveillance system divided by the total number of cases meeting the case definition.

Sensitivity of detection of outbreaks Ability of the surveillance system to detect outbreaks.

Simplicity System structure and ease of operation: surveillance systems should be as simple as possible while still meeting objectives. Simplicity also affects the amount of resources required to operate the system. It is closely related to acceptance and timeliness.

Stability Reliability (i.e. the ability to collect, manage and provide data properly without failure) and availability (the ability to be operational when it is needed) of the system. This includes commitment from government and/or donors.

Surveillance reporter Health worker at a community or at facility level who reports alerts or regular surveillance data.

Timeliness (*of reporting*) Proportion of all expected reports in a reporting system received by a given due date. Timeliness reflects the speed between steps in a public health surveillance system and includes alerts notification, outbreak investigation, response and weekly surveillance.

Usefulness Ability of the surveillance system to meet the objective(s) for which it was designed. Usefulness is indicated by describing the actions taken as a result of analysis and interpretation of the data from the system. Usefulness is usually determined by all the attributes of a system.

Zero reporting Reporting the absence of cases of a disease under surveillance; this ensures that participants have not merely forgotten to report.

Humanitarian emergencies often increase the risk of transmission of communicable diseases, resulting in increased morbidity and mortality, particularly from outbreak-prone diseases. To address this increased risk, WHO and its partners established the Early Warning Alert and Response Network (EWARN), a simplified disease surveillance and response system that focuses on early detection of and rapid response to outbreaks or unusual health events. Evaluations of EWARN have previously been conducted without a standardized methodology in place. This evaluation protocol has been developed to provide guidance and standardized methods to ministries of health to evaluate EWARN implemented in countries of WHO's Eastern Mediterranean Region. This protocol draws on lessons learned from previous EWARN implementation and evaluations.

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