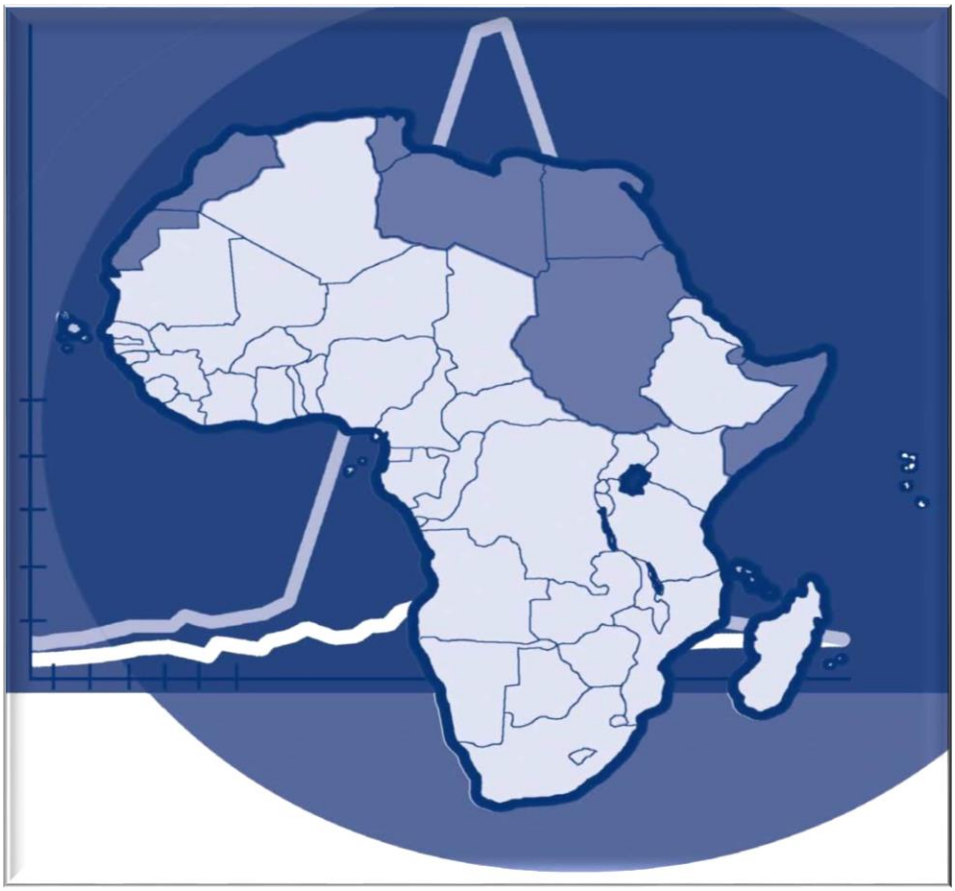
TECHNICAL GUIDELINES FOR INTEGRATED DISEASE SURVEILLANCE RESPONSE IN THE WHO AFRICAN REGION

THIRD EDITION

BOOKLET FOUR: SECTIONS 8 AND 9



World Health Organization
REGIONAL OFFICE FOR Africa

This booklet comprises the following sectionS of the Integrated Disease Surveillance and Response Technical Guidelines:

Section 8: Monitor, evaluate, supervise and provide feedback to improve surveillance and response
Section 9: Electronic Integrated Disease Surveillance and Response (eIDSR

TECHNICAL GUIDELINES FOR INTEGRATED DISEASE SURVEILLANCE AND RESPONSE IN THE WHO AFRICAN REGION

THIRD EDITION

BOOKLET FOUR: SECTIONS 8 AND 9

MARCH 2019

World Health Organization
Regional Office for Africa
WHO Health Emergency Programme
Brazzaville, Republic of Congo

Centers for Disease Control and Prevention
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Integrated Disease Surveillance and Response Technical Guidelines, Booklet Four: Sections 8 and 9

WHO/AF/WHE/CPI/02, 2019

Suggested citation. Integrated Disease Surveillance and Response Technical Guidelines, Booklet Four: Sections 8 and 9. Brazzaville: WHO Regional Office for Africa; 2019. Licence: CC BY-NC-SA 3.0 IGO.

Cataloguing-in-Publication (CIP) data. CIP data are available at http://apps.who.int/iris.

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Designed and printed in the WHO Regional Office for Africa, Brazzaville, Congo

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ABBREVIATIONS

AAR	after action reviews
AEFI	adverse events following immunization
AFP	acute flaccid paralysis
AFRO	WHO Regional Office for Africa
AWD	acute watery diarrhoea
CDC	Centers for Disease Control and Prevention
CDO	County Diagnostic Officer
CBS	community-based surveillance
CBIS	community-based information system
CEBS	community event-based surveillance
CFR	case fatality rate
CHA	Community Health Assistants
CHSS	Community Health Services Supervisor
CHO	County Health Officer
CHT	County Health Team
CHV	Community Health Volunteer
CSO	County Surveillance Officer
DDO	District Diagnostic Officer
DHIS2	District Health Information System version 2
DHO	District Health Officer
DHT	District Health Team
DPC	Disease Prevention and Control Department
DRM	Disaster Risk Management
DSO	District Surveillance Officer
EBS	event-based surveillance
eDEWS	Electronic Disease Early Warning System
EOC	Emergency Operations Centre
EPI	Expanded Program on Immunization
EPR	Emergency Preparedness and Response
EVD	Ebola virus disease
HCF	healthcare facility
HCW	healthcare worker
HIV/AIDS	human immunodeficiency virus and acquired immune deficiency syndrome

HMER	Health Management Information Systems, Monitoring and Evaluation and Research Units
HMIS	Health Management Information System
HPO	Health Promotion Officer
IDSR	Integrated Disease Surveillance and Response
IBS	Indicator Based Surveillance
IMS	Incident Management System
IEC	Information, Education and Communication
IMC	International Medical Corps
IOM	International Organization for Migration
IPC	Infection Prevention and Control
IHR 2005	International Health Regulations (2005)
IRC	International Rescue Committee
JEE	Joint External Evaluation
LISGIS	Liberian Institute of Statistics and Geo-Information Services
MCH	Maternal Child Health
MDR	multidrug resistance
MEF	Monitoring and Evaluation Framework
MOH	Ministry of Health
MOA	Ministry of Agriculture
MTI	Medical Teams International
NGO	nongovernmental organization
NNT	Neonatal tetanus
NSTCC	National Surveillance Technical Coordination Committee
OIC	Officer in Charge
PCI	Project Concern International
PHE	Public health events
PoE	Points of Entry
PHEIC	Public health emergency of international concern
PHEMC	Public health emergency management committee
PPE	Personal protective equipment
RRT	Rapid response team
RTA	road traffic accident
SARS	Severe Acute Respiratory Syndrome
SCI	Save the Children International
SFP	Surveillance Focal Point
SIMEX	simulation exercise

STI	sexually-transmitted infections
UNICEF	United Nations Children's Emergency Fund
VHF	Viral Haemorrhagic Fever
WHO	World Health Organization
XDR	Extensively drug-resistant

FOREWORD

In 1998, the World Health Organization (WHO) Regional Office for Africa (AFRO), together with its technical partners, adopted a strategy for developing and implementing comprehensive public health surveillance and response systems in African countries, initially called Integrated Disease Surveillance. However, to highlight the linkage between surveillance and response, the strategy was later renamed Integrated Disease Surveillance and Response (IDSR). The first edition of the IDSR technical guidelines (2002) was widely adopted by Member States. Although progress towards a coordinated, integrated surveillance system has been mixed, almost every country in the Region and their partners invested human and material resources in the process, in an effort to build capacities for public health surveillance systems for early detection, confirmation and response to public health threats, to prevent unnecessary illness, death and disability. The coming into force in 2007, of the International Health Regulations (IHR 2005), the emergence of new diseases, conditions and events and the formulation of strategies for disaster risk management (DRM) resulted in the need to revise the first edition of the IDSR guidelines. There was also a need to address the increasing burden of noncommunicable diseases. Also, community-based surveillance for early detection, rapid confirmation and response to public health threats had to be enhanced, while alignment with broader system strengthening objectives was necessary. This led to the development of the second edition of the IDSR guidelines in 2010.

Despite the availability of the IDSR technical guidelines, the Region continues to face challenges in public health surveillance systems, which hinder its capacity to prevent, detect and respond to public health threats. The unprecedented Ebola virus disease (EVD) outbreak in 2014 in West Africa, and other recent health emergencies have shown that the IHR (2005) has not been fully implemented in many Member States. Consequently, addressing health emergencies remains a major challenge.

Following my election in January 2015 as Regional Director, after internal and external consultations, in May 2015, I unveiled the *Transformation Agenda of the WHO Secretariat in the African Region, 2015-2020.* One of the five interrelated and overlapping priorities in the Transformation Agenda is improving health security.

I am glad to unveil the third edition of the IDSR guidelines, prepared by the WHO Health Emergencies (WHE) Programme in the WHO African Region, with the active participation of all the clusters. In addition, WHO headquarters, the intercountry support teams, hubs, WHO country

offices, Member States, and the United States Centers for Disease Control and Prevention (CDC) and other relevant stakeholders all provided valuable support.

Many public health events and emergencies and their associated risk factors could be prevented, or their effects mitigated. However, the health systems in most countries remain inadequate. To avert and mitigate the effects of future health security risks and emergencies, all Member States are urged to implement these IDSR guidelines.

These guidelines recommend thresholds for action on priority diseases, public health events and conditions and for responding to alerts. Using these action thresholds can be lifesaving. I therefore urge all Member States to fully implement this third edition of the IDSR guidelines everywhere in the WHO African Region because they explicitly describe what needs to be established at each level of the health system in order to detect, confirm, and respond to diseases/health events that are responsible for all preventable illnesses, deaths and disabilities in local communities.

The cost of good public health surveillance, as a public health good, is relatively low, compared to many other strategies. I appeal to all Member States, national, regional and international partners and funders to join us in beginning the hard work now. Let us all embrace these IDSR guidelines to strengthen capacities for preparedness, alert and response for health security throughout the WHO African Region. The guidelines should be used by:

(a) health workers at all levels (including surveillance officers, clinicians, laboratory personnel and public health workers)
(b) provincial and district health teams
(c) data managers
(d) IHR national focal points and other sectors implementing IHR
(e) competent authorities at points of entry (PoE)
(f) veterinary and wildlife health officers
(g) environmental health officers
(h) health training institutions
(i) supply chain officers
(j) other public health experts, including nongovernmental organizations (NGOs).

The guidelines are intended for use as:

(a) a general reference for surveillance activities at all levels;
(b) a set of standard definitions for threshold levels that initiate action for responding to specific diseases;
(c) a stand-alone reference for level-specific responsibilities;
(d) a resource for developing training, supervision, monitoring and evaluation of surveillance activities;
(e) a guide for improving early detection and response to epidemic-prone diseases.

Finally, I appeal to you all to ensure that the third edition of the IDSR guidelines are implemented within the broader context of health system strengthening; better coordination between human and animal health surveillance and other sectors involved in the One Health approach; improved use of laboratory network capacity in surveillance and response; and better community engagement in public health interventions.

Dr Matshidiso Moeti
WHO Regional Director for Africa

ACKNOWLEDGMENTS

The third edition of the Integrated Disease Surveillance and Response (IDSR) Technical Guidelines was prepared by the WHO Health Emergencies (WHE) Programme with the active participation and involvement of programmes dealing with disease surveillance at the WHO Regional Office for Africa (AFRO), Brazzaville, Congo and with technical reviews provided by the U.S. Centers for Disease Control and Prevention (CDC) and the U.S. Agency for International Development (USAID).

The purpose of revising these IDSR technical guidelines was to:

a) Align with the current situation and needs of the Member States.

b) Align with the objectives, targets and elements of the WHO Africa Region's strategy for health security and emergencies 2016–2020.

c) Update the guidelines with contemporary information, taking into consideration new developments such as: emerging and re-emerging priority diseases, conditions and events.

d) Incorporate recent recommendations from expert panels on strengthening the IHR, 2005 that are underpinned on the One Health approach.

e) Holistically address disaster risk management (DRM) strategies.

f) Take into account lessons learnt from the unprecedented EVD outbreak in West Africa, polio eradication and other humanitarian crises.

g) Take advantage of technology advancement and utilize the opportunities offered by the internet and mobile phones to scale up the implementation of real time community event-based surveillance (CEBS), with robust geographical information system (GIS) platforms.

h) Scale up other electronic surveillance systems and incorporate new ways for capacity building using the IDSR eLearning tools.

In planning to update these guidelines, suggestions and advice for improving the recommendations were sought and gratefully received from the IDSR development teams who prepared the 1st and 2nd editions. This revision builds on the technical expertise from more than 100 surveillance and disease experts at WHO, CDC and Ministries of Health in African countries who conceived and produced the 1st and 2nd Editions.

The revision process involved internal WHO consultation followed by a wider consultation that involved a series of meetings with various partners and Member States. In addition, the IDSR task force was constituted to help with the revision process. The final draft was peer reviewed by the *ad hoc* task force as well as during a final partner consultative meeting held in March 2018.

The revision of the technical guideline was supported through a cooperation grant from the United States Agency for International Development, Bureau for Africa (USAID/AFR), Washington, D.C.

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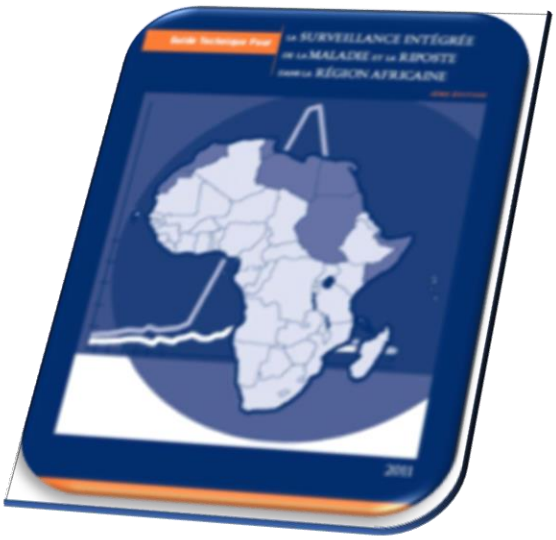
INTEGRATED DISEASE SURVEILLANCE AND RESPONSE TECHNICAL GUIDELINES

THIRD EDITION



SECTION 8: MONITORING, SUPERVISING, EVALUATING AND PROVIDING FEEDBACK TO IMPROVE SURVEILLANCE AND RESPONSE

MARCH 2019

MODULE 8: MONITOR, SUPERVISE, EVALUATE AND PROVIDE FEEDBACK TO IMPROVE SURVEILLANCE AND RESPONSE

8. MONITOR, SUPERVISE, EVALUATE AND PROVIDE FEEDBACK TO IMPROVE THE SURVEILLANCE AND RESPONSE SYSTEM

Monitoring of surveillance and response systems refers to the routine and continuous tracking of planned surveillance activities (prompt delivery of reports, for example), while evaluation, which is done periodically (annually, for instance), assesses whether surveillance and response objectives have been achieved. Both monitoring and evaluation help to understand if the system has been working effectively. By evaluating information regularly, for example at the end of a given year, supervisors are able to determine whether surveillance and response objectives have been achieved and whether outcomes are of high quality. Through supervision, supervisors and health professionals work together to review progress, identify problems, determine causes of the problem and develop feasible solutions. Sustainable supervision and feedback have been shown to contribute to improved performance of national disease surveillance systems.

This section will describe how to routinely monitor and annually evaluate performance of the surveillance system and specific disease or public health event control and prevention programmes. The section will concentrate on core surveillance functions described in the introduction section, and also describe how supervision and provision of feedback are key to improving the surveillance and response systems.

Some benefits of routine monitoring of the IDSR system are:

(a) tracking progress of implementation of planned activities and ensuring that planned targets are achieved in good time;

(b) tracking progress of improvements in targeted indicators of the quality and attributes of the system, such as timeliness and completeness of reporting;

(c) identifying problems in the system in order to institute corrective measures in a timely manner;

(d) ensuring that all implementers of the systems are held responsible and accountable for their defined activities; and

(e) ensuring that stakeholders can receive information on performance of the surveillance system.

Some benefits of evaluating the surveillance system are:

(a) ensuring that the surveillance system meets the objectives for which it was formulated;

(b) documenting surveillance system status and change in performance;

(c) providing evidence, based on which surveillance objectives, implementation strategy and planned activities can be modified;

(d) enabling planning of resource allocation;

(e) providing explanations for achievements and failures in the system; and

(f) providing specific recommendations for improving the system.

Some benefits of providing feedback after supervision are:

(a) reinforcing health staff efforts to participate in the surveillance system;

(b) motivating those who provided data, hence scaling up compliance for reporting;

(c) improving quality of data provided by data collectors;

(d) enhancing planned public health action;

(e) complementing planning of appropriate actions; and

(f) strengthening communication and spirit of team work.

Section 3 of these guidelines describes how, each month, health staff responsible for surveillance at health facility and district levels review and analyse data that is reported during the month. Conclusions are drawn about the following:

(a) timeliness and completeness of reporting from each level;

(b) quality of routine prevention and control activities taking place, so that when problems are detected, districts respond with appropriate action.

The same information can also be used during supervision to routinely monitor, and annually evaluate:

(a) timeliness in reporting immediately notifiable diseases, conditions or events;

(b) outbreak investigations and responses; and

(c) reporting of summary data on a routine basis.

When problems are detected in the surveillance and response system, action can be taken to strengthen it. By providing feedback to health workers for implementing identified corrections, it is more likely that results of desired outcomes will be evident. For example, one may use the monthly monitoring data to do an evaluation at the end of the year, and questions to help carry out an evaluation may include:

(a) Are surveillance objectives for existing activities being met?

(b) Were surveillance data used for taking public health action?

(c) Did surveillance, laboratory and response activities have an impact on the outcome of health events in the district?

8.1 Identify targets and indicators

Using indicators is helpful in measuring the extent of achievement for a particular programme or activity. Indicators are signs of progress — they are used to determine whether the programme/intervention is on the way to achieving its objectives and goal. This achievement is then compared to overall recommended performance standards. Apart from performance standards, there are some disease-specific surveillance indicators that may be used to monitor quality of the surveillance system, e.g. those for AFP and measles.

Indicators are also used to assess performance of the surveillance system, to ascertain whether it is reaching its targets and objectives. For example, a district may have a goal of reaching 100% completeness of reporting by a certain period. An indicator can be developed to measure the proportion or percentage of facilities that are reporting. This proportion is then compared with the desired goal or target, and can be used to evaluate progress and, therefore, quality of a given service or activity.

8.1.1 Use indicators in accordance with national goals and specific plans

Use indicators according to national goals and specific plans to improve integrated disease surveillance and response activities in a district. Select indicators that are most relevant to the district's plan for improving surveillance in the current year, and that will provide information the district can use.

8.1.2 Select data for measuring indicators

After selecting relevant indicators, specify the numerator and the denominator. For example, if a district's objective is for all health facilities to keep trend lines for selected priority diseases, the numerator and denominator are defined as follows:

Indicator: The proportion of health facilities in the district that keep trend lines for priority diseases.

Numerator: The number of health facilities that keep trend lines for priority diseases.

Denominator: The total number of health facilities in the district.

8.1.3 Ensure availability of data sources

Each level should make sure that the level it supervises has the following sources of data available. For example, the national level has data available from district and regional/provincial levels to conduct required monitoring activities.

Table 8.1: Types of sources of data at various levels

Data source	Health Facility	District	Provincial/Regional	National
Monitoring chart for tracking indicators (Sample charts are in Annex 8A.)	X	X	X	X
Outpatient register	X			
Inpatient register	X			
Health facility reporting forms	X			
Case-based and/or line listing reporting forms	X	X	X	X
Outbreak investigation report	X	X	X	X
Log of suspected outbreaks and rumours	X	X	X	X
Supervisory reports from district and/or province/region		X	X	X
Laboratory reports received	**X**	**X**	**X**	**X**

8.2 Monitor core functions for IDSR at district level

Indicators for core functions measure processes and outputs from the surveillance system. In the introductory section, core surveillance functions have been described and so one may refer to the table of core surveillance functions for each level. This subsection describes key indicators at various levels, in relation to core functions. Here, core functions are succinctly described, but further detail of said functions is provided in Annex 8A-D, where indicators for each core function are available.

The core functions are:

(a) Identifying cases and public health events

(i) Case detection is the process of identifying cases and outbreaks. Case detection may be done through the formal health system, private health systems or community structures. Case definitions and a functioning rumour-verification system are vital for case and outbreak detection. Once a case has been identified, it has to be recorded in a register (outpatient or inpatient register, clinical cases register etc.). In many countries, health workers use any of these registers to extract the IDSR priority diseases.

(ii) Monitoring indicators should be established to monitor this core surveillance function. Examples of indicators could be:

- Proportion of health facilities that have standardized registers for recording diseases. Further assessment could also be done to examine the validity and quality of information recorded as well as factors that affect registration.
- Proportion of health facilities using standard case definitions (SCD) to identify IDSR priority diseases of cases.

(b) Report cases and events

(i) Reporting refers to the process by which surveillance data move through the surveillance system from the point of generation to the next level.

(ii) It also refers to the process of giving account of suspected and confirmed outbreaks as well as notifying under the IHR 2005 of PHEIC, using the decision instrument mentioned in section 2.

(iii) There may be different reporting systems, depending on the type of data and information being reported, purpose and urgency of relaying data/information, and where the latter is being reported.

(iv) Timely submission of data is critical for prompt outbreak detection and response to prevent widespread outbreaks. Health facilities should, therefore, strive to submit reports on time, as prescribed in national guidelines.

(v) Examples of indicators for this core surveillance function include:

- Proportion of complete surveillance reports submitted on time to the district.
- Proportion of cases of diseases targeted for elimination, eradication and any other disease selected for case-based surveillance reported with case-based forms or line lists.

(c) Analyse and interpret data

(i) Analysing data is the systematic process of examining data to generate relevant information for timely and appropriate public health action to be taken.

(ii) Surveillance data should be analysed routinely and the information interpreted for use in public health actions.

(iii) Capacity for routine data analysis and interpretation should be established and maintained for epidemiological and laboratory data.

(iv) Examples of indicators which can be used to monitor analysis include:

- Proportion of priority diseases for which a current line graph is available.
- Proportion of districts that report laboratory data for diseases under surveillance.

(d) Investigate and confirm suspected cases/outbreaks

(i) Case/outbreak confirmation depends on the epidemiological and laboratory capacity for confirmation.

(ii) Capacity for case confirmation is enhanced through improved referral systems, networking and partnerships. This implies having the capacity for appropriate specimen collection, packaging and transportation.

(iii) Internal and external quality-control mechanisms are important elements for case confirmation; they help to ensure the validity and reliability of test results.

(iv) Examples of indicators for monitoring this core function include:

- Proportion of suspected outbreaks of epidemic-prone disease notified to the district level within 24 hours of crossing the epidemic threshold.
- Proportion of investigated outbreaks with laboratory results.

(e) Prepare

(i) Epidemic preparedness refers to the existing level of preparedness for potential epidemics, and includes availability of preparedness plans; stockpiling; designation of isolation facilities; and setting aside resources for outbreak response.

(ii) Examples of indicators which can be used to monitor preparedness include:

- Proportion of health facilities with stock of key items (e.g. PPE, specimen collection kits, case-investigation forms, intravenous fluids, treatment kits) for response.
- Proportion of districts with emergency preparedness and response plans.

(f) Respond

(i) Public health surveillance systems are only useful if they provide data for appropriate public health response and control. For an early warning system, the capacity to respond to detected outbreaks and emerging public health threats needs to be assessed. This can be done, following a major outbreak response and containment, to document the quality and impact of public health response and control.

(ii) Some examples of indicators for monitoring response include:

- Proportion of districts with functional multisectoral emergency public health preparedness and response committees.
- Proportion of districts with functional public health emergency rapid response teams (PHERRT).
- Case-fatality rate for the epidemic-prone disease reported.

(g) Provide feedback

(i) Feedback is a process in which the effect or output of an action is returned (fed back) to modify the next action. It is an important function of all surveillance systems. **Item 8.5.2** of this section provides a thorough description of types of feedback which may be used to improve performance of IDSR.

(ii) Some examples of indicators for feedback include:

- Proportion of districts producing regular epidemiological bulletins.
- Proportion of feedback bulletins/reports received from national levels (when evaluating feedback from national to subnational levels).
- Proportion of health facilities with at least one IDSR technical support supervision visit in the previous quarter.

NOTE: While all indicators for the IDSR core functions are important, the WHO Regional Office for Africa will measure overall performance of core functions of IDSR in the countries, using 14 key performance indicators described in Annex 8J.

8.3 Monitor quality of IDSR activities at district level

The quality level of the surveillance system is defined by attributes such as:

(a) completeness
(b) timeliness
(c) usefulness
(d) sensitivity
(e) positive predictive value (PPV)
(f) specificity
(g) representativeness
(h) simplicity
(i) flexibility
(j) acceptability
(k) reliability

Periodically, quality of the surveillance system should be assessed, based on these indicators.

Surveillance attributes can be evaluated using quantitative and qualitative methods. Some tools that may be used to comprehensively evaluate surveillance systems include: the updated Morbidity Mortality Weekly Report (MMWR); updated guidelines for evaluating public health surveillance systems, produced by the United States Centers for Disease Control and Prevention

(CDC); and the framework for evaluating public health surveillance systems for early detection of outbreaks (CDC, 2001). Countries, which already have a Field Epidemiology Training Programme (FETP) or an equivalent applied epidemiology programme, should use residents to assist in evaluating the surveillance and response systems of IDSR and other disease surveillance systems.

8.3.1 Monitor timeliness and completeness of monthly reporting

An important indicator of a good-quality reporting system is the timeliness and completeness of reporting at each level. In the event reports are sent and received on time, the feasibility of detecting a problem and conducting prompt and effective response is greater. If, however, reports are incomplete, then the information cannot describe the problem, and if they are late, or not submitted at all, aggregated information for a given district (or any other administrative area) will not be accurate. In such an event, outbreaks can go undetected, and other opportunities to respond to public health problems will be missed.

8.3.1.1 Timeliness

The single most important measure of timeliness is whether data are submitted in good time to begin investigations and implement control measures. Timeliness of reporting should be measured against standards developed by each country, in accordance with timelines set by the WHO Regional Office for Africa. Important aspects of timelines of reporting in a communicable disease surveillance system include:

- timeliness of immediate notification, i.e. within 24 hours;
- timeliness of weekly reporting; and
- timeliness of monthly reporting.

(a) Monitor detection and notification of immediately reportable diseases or events

Monitor how well the system is able to detect immediately notifiable diseases or events. Monitor the interval between the onset of the first known case and when the case was seen in the health facility. If this interval is too long, it will seriously affect the health outcome of individual patients and will alter the spread of outbreak.

Other intervals to monitor for detection of immediately reportable diseases include, monitoring reporting from community to health facility and its district (within 24 hours of onset of illness); from health facility to district (within 24 hours); and from the time threshold is reached to the time of concrete response (within 48 hours).

(b) Timeliness of weekly and monthly reporting

If dates on which reports are received are routinely recorded and reviewed, system effectiveness can easily be assessed each month, in the course of analysing routine and case-based data. A monitoring tool, such as the one in Annex 8G, may be used to monitor timeliness in the district. For example, use the record of reports received to:

- measure how many reporting units submitted reports for a given week/month against the number of units expected to report;
- identify which reporting units have reported; and
- measure how many monthly reports were timely.

Ensure deadlines are given for each level to enable effective monitoring.

8.3.1.2 Completeness

Completeness in surveillance can have varying dimensions and may include the following:

(a) Completeness of reporting sites submitting surveillance forms:

Completeness of reporting sites refers to the proportion of reporting sites that submitted a surveillance report, irrespective of the time that report was submitted. Computing completeness of reporting sites for each of the surveillance reports can:

(i) provide a trend analysis on completeness of reporting for each of the surveillance reports over a period of time; and assist in identifying how each site is performing;

(ii) in addition, trigger further investigation for reasons of poor performance, and possibly help to identify solutions to correct such performance.

(b) Completeness of case reporting

Completeness of case reporting refers to the match between the number of cases reported and the actual number of cases. This can be obtained by comparing the number of notifiable conditions reported to the next higher level (over a period of time), with the number of cases recorded in the patient register, over the same period.

(c) Completeness of surveillance data

Completeness of surveillance data is the match between the expected data requirement and what is reported. The following questions are useful in determining completeness of surveillance data and its implications on public health actions:

(i) Are all data on each of the required variables in a surveillance form collected, registered, validated and compiled?

(ii) If not, which variables are not routinely collected, and what problems are encountered in their collection?

(iii) What is the implication of missing data on the quality of surveillance data?
(iv) How can this problem be resolved?

8.3.1.3 Identify problems and take action

If monitoring information shows that a health facility or any other reporting unit has not provided a report, or if the report is not on time, the surveillance focal point at the facility should be contacted. Work with the designated staff to identify what has caused the problem, and develop solutions together (for example, find out if a reliable supply of forms or other reporting method such as text messaging or radiophone is available). Explain to the facility staff the benefits of collecting good-quality data and reporting it in good time. This can help them, for instance, to detect outbreaks, improve forecasting of medicines and supplies, and improve overall health facility management.

Additionally, ask if a new staff person has started working at the facility, and is yet to receive orientation on the procedure for reporting; or find out if health facility staff receive feedback about case reports they have generated, and if there are resources available for taking action in response to the information obtained.

Make plans with the reporting unit to find solutions for improving the situation. Explain that, when information is complete, the district can assist health staff more efficiently with planning responses and carrying them out. For example, if lack of supplies is a problem, the district can use the reporting information to advocate with higher levels in the system.

8.3.1.4 Report timeliness and completeness to other levels

When routine reports or line-listed records of the number of cases are being sent to the provincial, regional or national level, include also necessary data for timeliness and completeness. This will help the other levels to understand the situation much more clearly, and to evaluate quality of the data that is being sent. For example, if the report to the national level states that two cases of measles were detected during the month, it should also include information about the number of health facilities that have reported. It will make a difference to the other levels, when they evaluate the information, if the 2 cases occurred with only 20%, rather than 100% of the units reporting.

8.3.2 Monitor other attributes for assessing quality of the IDSR system

Some other key attributes are summarized in the table below and can be used to assess quality of surveillance systems during periodic evaluation assessments (Table 8.2). Readers are referred to the updated framework for evaluating surveillance systems for a complete list of attributes.

Table 8.2: Summary of other attributes for assessing quality of the surveillance system

Attribute	Definition	Examples of some questions to assist in assessment
Usefulness	Describes if the surveillance system has been able to contribute to the prevention and control initiatives or has been useful in contributing to performance measures e.g. Usefulness of surveillance data in an early warning system	Is the system e.g. the early warning system able to detect outbreaks early? Example: A useful system, over time must, demonstrates that a certain intervention has been instituted and has worked effectively. In a malaria programme, data collected over time might show if ITN has been useful in reducing incidences of malaria among children under five years
Simplicity	Simplicity refers to structure of the system and ease of its implementation from the end-user to those at higher levels.	Is the system simple? e.g. is the standard-case definition simple? Does it have multiple reporting structures? Example: A health worker has to report maybe to the district, as well as to another vertical programme if a disease is under that programme
Acceptability	Acceptability of a system is a reflection of the willingness of the surveillance staff to implement the system, and of the end-users to accept and use data generated through the system	How is the participation rate of surveillance sites? How is the degree of completeness of reports? Example: number of health facilities submitting reports on time
Representativeness	Representativeness refers to the degree to which reported cases reflect occurrence and distribution of all cases in the population under surveillance.	Is the system covering all geographical areas to ensure accurate capture of cases? NB: A good system should be able to cover all population, even those who are marginalized
Data quality	Data quality reflects completeness and validity of data recorded in the public health surveillance system.	For completeness one can examine the percentage of "unknown" or "blank" responses to items on surveillance forms NB: Validity depends on data quality. Error-prone systems and data prone to inaccurate measurement can negatively affect detection of unusual trends.

For further information on the other unmentioned attributes above, please refer to Centers for Disease Control and Prevention (CDC) (2001). Updated guideline for evaluating public health surveillance systems. MMWR: 50 (RR-13); 1–35.

8.4 Monitor quality of surveillance activities at community level

8.6.1 8.4.1 Monitor events from community-based surveillance

Monitoring a CBS system is as equally important as monitoring health facility, districts and regions. Community health workers, community focal persons and/or volunteers involved in the system must understand the benefit of the system, and know that their input is of value and can assist in improving or adapting the system to work better for the community.

Qualitative feedback from volunteers and the community is an essential part of contextualizing and understanding quantitative CBS data. A system should be in place from the beginning to capture community and volunteers feedback, and this may involve one or more of the following approaches:

(a) open and regular community meetings where all issues are noted and acted upon;
(b) focus group discussions with volunteers and/or community leaders;
(c) suggestions and complaints box (es) for use in the community;
(d) appointment of a community representative(s) to gather feedback and complaints; and
(e) feedback platforms on mobile phones, which may be used by community volunteers to give feedback.

There should also be community-driven data analysis and monitoring, whereby communities are supported to undertake their own data analysis. Communities may be provided with basic material to record the type of occurrences they report, as well as resulting actions, and also record outbreaks or events that occurred but did not trigger an alert, so that triggers can be adjusted. Some performance indicators listed below (Table 8.3), are examples of indicators for community-based surveillance.

Table 8.3: Examples of indicators for community-based surveillance

Number of alerts detected	An alert is unofficial information about a disease, condition or event of public health importance which may be true or invented	Number of alerts detected from each CBS focal person	CBS reports
Proportion of alerts responded to within 24hr–28hr	**Numerator:** number of alerts responded to on time. **Denominator:** Total number of alerts detected from CBS focal person NB: responding to alerts is defined as visit by the nearby health facility for case investigation, case management, health promotion, community sensitization and distribution of materials (must be defined according to response plan)	Number of alerts responded to within 24hr–48hr divided by total number of alerts reported	CBS reports and response reports
Proportion of alerts which are true events	Number of true events detected	Total number of true events detected divided by total number of alerts reported	CBS reports and response reports

8.5 Supportive supervision and feedback for improving IDSR activities

8.5.1 Supportive supervision

Supportive supervision is a process of helping to improve work performance. Supervision is not an inspection. Rather, good supportive supervision aims to sustain good-quality services, and not to find what is wrong with the latter.

In a good supportive supervision system, supervisors and health professionals work together to review progress, identify problems, decide what has caused the problem and develop feasible solutions.

(a) Ensure availability of job descriptions and standard operating procedures (SOPs) for surveillance staff

Job descriptions and SOPs are the basis for conducting supervision and assessing performance. Review job descriptions and SOPs of health staff who have a role in the surveillance and response system. Make sure that a job description states:

(i) the surveillance tasks to perform;
(ii) to whom the staff person reports; and
(iii) a defined scope of work, as well as SOPs that are adhered to in practice.

(d) Prepare a supervision plan

Include surveillance and response targets in the overall plan for supervision in a district. For example:

(i) Decide how often to monitor health staff performance. For instance, a district may decide to conduct a supervisory visit at least 4 times in a year for each health facility. In some countries, depending on resources, supervisory visits take place more often (monthly, for example).
(ii) Ask health facility supervisors to make a schedule of supervision they intend to conduct over the next year in their own facilities, and in any community sites that report to the facility.
(iii) Make sure that transport is available for supervision and for surveillance activities that require transportation means. For example, coordinate travel or logistics for surveillance supervisory visits with visits made by other programmes or activities.
(iv) Include in the overall plan, other reporting sites in supervision of district surveillance activities, such as private health centres, other clinics (of schools, uniformed forces etc.), medical centres and community reporting sites.

(e) Use a supervisory checklist

Each health facility has unique problems and priorities that require specific problem solving and corrections. To maintain positive motivation of health facility staff for their efforts at ensuring improvement, consider developing a graduated checklist to guide the supervisory visit. The items listed in a graduated checklist (such as the one in Annex 8H) are some of the examples of achievements that a health facility can be evaluated on. Always refer to Annex (8 A–D) and look for additional examples to evaluate for each core surveillance function at the health facility level. For example, when the facility has achieved one objective (using standard-case definitions consistently, for instance), work with health facility staff to include the next indicator or item for monitoring performance, such as using thresholds for action. Revise the supervisory checklist accordingly. Use it during future visits to help health staff in monitoring their activities and progress towards an improved system.

During the visit, use a checklist to monitor how well health staff are carrying out the recommended surveillance functions. For example, a district surveillance officer visiting a health facility for a supervisory visit should verify the following:

Identifying and registering cases	Check the health facility register to see if the case diagnoses correspond to the recommended case definition. Check the register to see if all columns are filled out correctly.
Confirming cases	Compare laboratory records for priority diseases with the number of cases seen in the clinic for the same period of time. For example, compare the number of positive malaria slides with the reported number of hospitalized malaria cases.
Reporting	Ask to see copies of the most recent reports for the most recent reporting period. Compare the number of cases of priority diseases that were reported with the number recorded in the register. Check the date on which the case report was sent against the date recommended for sending the report. Check reports to make sure they are complete and accurate.
Reviewing and analysing data	Verify that trend lines are prepared and updated for priority diseases. Ask to see the "Health Facility Analysis Book," or the electronic health facility data in your district. Look to see if the trend lines for selected diseases are up to date.
Preparedness	Look at the stocks of emergency drugs, supplies and PPE to be sure there is adequate supply.

Note: A sample supervisory checklist is in Annex 8H at the end of this section. Additionally, Annex 8A–D, describes details of core surveillance functions at health facility level and can be used for guidance in supervision of the health facility. Questions to be answered during a supervisory visit may be adapted or modified to meet specific concerns, and determine the extent of progress towards an integrated surveillance system within a health facility.

(f) Conducting supervisory visits

Conduct regularly-scheduled supervision at all levels (national to region/province; region/province to district; district to subdistrict/facility; subdistrict/facility to community) to ensure that:

(i) appropriate supplies (e.g. forms, job aids) and required standard-case definitions/ guidelines are available;

(ii) public health staff know how to identify and use standard-case definitions to record suspected cases of priority diseases seen in their health facility;

(iii) priority diseases are recorded in the case register, according to the case definition;

(iv) some data are analysed in the health facility to identify thresholds to take action both for routinely reported priority diseases (disease of public health importance) and case-based diseases (epidemic-prone diseases, and diseases targeted for eradication or elimination);

(v) reported cases of diseases, conditions, or events for which a single case is a suspected outbreak or public health emergency, are investigated promptly (for example a single confirmed case of cholera or polio, maternal death, MDR/XDR TB);

(vi) response takes place when outbreaks or other public health events are confirmed, or when problems are identified in routine reporting;

(vii) response actions are monitored and action is taken by the health facility to improve surveillance and readiness for outbreak response.

Make sure during the visit to:

(i) provide feedback to health staff. Let them know what is working effectively and what is not. Also give feedback on how previously reported data was used to detect outbreaks and take action to reduce illness, mortality and disability in the district. If improvements are needed, discuss solutions with staff;

(ii) provide on-the-job training, as needed, if a problem is identified. For example, during review of the analysis workbook, the supervisor noted that case-fatality rates were not correctly calculated. The supervisor, therefore, met with the health staff who are in charge of calculation, and reviewed steps for calculating the rate with the staff in question;

(iii) follow up on any request for assistance, such as for emergency response equipment or supplies;

(iv) if solution to a pre-existing problem was identified during a previous visit, check to see how well the solution has been implemented. Find out if problems are still occurring and modify the solution, if necessary;
(v) ensure that both supervisor and supervisee(s) sign the supervision reports and also provide dates on which supervision was done.

(g) Writing a report on supervisory visit

Include in the report, achievements that were identified during the visit; also, state follow-up actions that were planned with the health staff, and any requests for additional resources, funds or special problems.

(h) Using supervisory visits to improve surveillance activities in the district

Visits of surveillance supervisors and regional or provincial disease control programmes are good opportunities to discuss and improve disease control in a district. For instance, if a national malaria control person visits the district, the reason why inpatient malaria deaths have not been declining could be discussed with them. Questions may also be asked about additional ideas or resources that the malaria control programme could provide.

8.5.2 Feedback

In most cases, health facilities and districts reliably report surveillance data to the next level as required. When district or regional/provincial or national managers receive data, they should respond to health facilities that provided them. The purpose of feedback is to reinforce health workers' efforts at participating in the surveillance system. Another purpose is to raise awareness about certain diseases and any achievements made by disease-control and prevention projects in the area. Feedback is classified as supportive when it reinforces and acknowledges good performance, and corrective, when a change in behaviour and improvement is required. It also strengthens the communication and spirit of team working. Feedback should be both vertical and horizontal targeting different audiences as provided by different levels in the health system. Effective feedback should be:

(a) specific to ensure that recipients understand the subject of the feedback;
(b) based on the report submitted or the actual events and activities observed in the field; and
(c) given as soon as feasible, after receiving the report or field visit, so that recipients will remember activities that should be sustained or corrected.

If the facility does not receive information from the next level about how data were used or what data meant, health staff may think that their reporting is not important. As a result, future reporting may not be reliable, since health staff will not know whether the information they sent to other levels was important or necessary. Their understanding of the health situation

may be good at their own level, but they may not have the needed information for characterizing the situation at district or national level. At community level, communication includes building relationships, communicating and coordinating with other community key informants, resource persons and existing formal and informal networks for information dissemination and reporting.

Feedback may be written, such as a monthly newsletter/bulletin, emails, WhatsApp, SMS or periodic official information like publications, or it may be given verbally through telephone calls or periodic meetings. Although this section focuses on district-level feedback, this can also be applied at health facility and national levels. Feedback may also be given during supportive supervision, by the district to health facilities, or by the region to districts or by the national level to districts and regions/provinces. Supervision can be on performance of health programmes and feedback can be provided during such supervisory visits.

(a) Developing and disseminating routine epidemiological bulletins

Feedback should also be given periodically of IDSR reportable diseases, and this can be done through weekly, monthly or quarterly epidemiological bulletins. Bulletins provide information on disease patterns and achievement of programme objectives in the country. They are usually brief and are important for reaching policy-makers, legislators, development partners, programme technical staff and stakeholders. As a minimum, they contain:

(i) a summary table with the number of reported cases and deaths, to date, for each priority disease;
(ii) a commentary or message on a given disease or topic; and
(iii) any relevant social, economic or cultural information or data on the context that can lead to creating real intelligence regarding an event.

Annex 8I shows examples of an epidemiological bulletin.

(b) Developing information summary sheets

An information summary sheet is a report that presents data and its interpretation in a table or other graphic format. For example:

(i) At a staff meeting, or during a supervisory visit, give a verbal report or comment about data that were reported by the health facility during a given period.
(ii) Display data in a simple table. Sit with health staff and show them the data. Talk together about the likely conclusions that may be drawn from said data. Consider conclusions not only for the health facility, but also for the district as a whole.
(iii) Prepare a single sheet with a simple table that shows how data reported for a given period are different from data reported for some other period or target population. For

instance, show the number of cases of diarrhoea with dehydration in children aged less than 5 years, from the same period last year, and compare them with a corresponding period in the current year, after a safe water project was implemented in a high-risk area, for example; use summary sheets to support requests made to higher levels for additional funds, supplies and resources.

(c) Developing district newsletters

The purpose of a district newsletter is to provide shorter updates than those provided in a more detailed feedback bulletin. The district newsletter is useful for informing and motivating health staff. The target audience for a newsletter could be health staff in the district. The newsletter may be 2 to 4 pages long, and produced simply with a computer-entered or typewritten text.

Examples of articles that could be carried in a newsletter are:

(i) summary of national or district data for a given priority disease;
(ii) report of progress towards a specific public health target;
(iii) report of specific achievements towards public health by an individual health worker or a group of health workers; and
(iv) description of special events or activities (for example, a change in market day).

8.6 Evaluate effectiveness of performance of the IDSR system

The purpose of evaluating a surveillance system is to assess its effectiveness and response system in terms of timeliness, quality of data, preparedness, case management, overall performance and using indicators to identify gaps or areas that could be strengthened. A comprehensive evaluation should thus include the surveillance system and, if already available, the IDSR Implementation Plan. Evaluation of the surveillance system should:

(a) show the extent to which desired outputs and outcomes are achieved;
(b) provide explanations for achievements, disparities and failures;
(c) document quality of the system and demonstrate any changes in its performance; and
(d) demonstrate the extent to which overall surveillance objectives are achieved.

Depending on the development status of surveillance in a district, select evaluation indicators that will provide information relating to district's priorities and objectives for the year.

If there is already an IDSR implementation plan, with clearly defined objectives, then it is appropriate to conduct mid-term and end-of-term evaluations. Otherwise, surveillance systems should be evaluated every 2, 3 or 5 years.

Key steps in evaluation include:

8.6.2 Defining objectives

Objectives should be simple, measurable, attainable, realistic, and time-bound (SMART).

8.6.3 Developing e evaluation indicators

Indicators should be identified for each of the evaluation objectives, and should be harmonized, as much as possible, with monitoring indicators.

8.6.4 Developing evaluation methods and tools

Based on these indicators, an evaluation protocol should be developed describing the evaluation process, methods, target group, data sources, data collection methods, and plan for data analysis and utilization.

8.6.5 Identifying people to conduct evaluation

(a) Determine who evaluators will be; people within the districts, people outside the district, or a mixture of people including partners/donors. Depending on the scope of evaluation, its purpose and available resources, a decision should be made during the planning stage on who should undertake evaluation.

(b) To ensure objectivity and transparency during the evaluation process, a blend of self-internal evaluations and external evaluations should be conducted periodically.

8.6.6 Conducting the evaluation

8.6.5.1 Compiling and organizing monitoring data and other results

The district health office should summarize surveillance data received from all health facilities in the catchment area, and submit a compiled report to the provincial/regional or national level as appropriate. Report submission should not be delayed due to late reports from some health facilities; promptly submit all reports received. Late reports should be submitted as they arrive. Follow up with health facilities who did not report or who consistently provide late reports.

Help health facilities to solve any problems that prevent them from submitting their summary reports on time. Provide regular feedback to health facilities about the indicator results. Feedback is a positive tool for motivating health staff to provide information on time, and contribute to the national reporting system.

The provincial/regional health department should compile surveillance data received from all districts in the province, and submit the report to national level. Report submission should not be delayed because a last report is late. The province/region should compile and submit available reports on time. Late reports may be sent separately when they are received.

The national level should compile surveillance data received from all provinces (and/or regions), and also look for epidemics that were not identified by districts. Follow up with areas where reporting continues to be unreliable or does not happen at all. Support provinces in providing assistance to districts when they evaluate measurements, and take action to improve the situation. Provide feedback to each and every level about national, provincial/regional, district and health facility levels.

Use a monitoring chart, such as the one on the next page, to monitor performance of indicators at your level. Share these results with staff in your catchment level. Acknowledge successes and help health staff to maintain positive progress. When problems occur, talk together about what is causing the problem and how it can be solved. Seek assistance of the next level, as needed, for obtaining additional help or resources.

Gather data from several sources. For example:

(a) Review objectives for the year listed in the district's annual plan for improving surveillance and response.
(b) Gather monthly summaries of cases and deaths reported to the district, spot maps, and other analysis results performed by the district.
(c) Collect any results from special surveys or studies that were done in the district over the previous year.
(d) Include case investigation forms and reports of outbreak response activities that took place in the district.
(e) Gather summary information from the community and also from health staff.

8.6.5.2 Analyse data

As summary data for the year are evaluated, some issues to make decisions on are as follows:

(a) Were the reports complete, on time and accurate?
(b) What were significant changes in disease or event trends during the year? If an increase occurred, was the problem identified?
(c) If additional cases are still occurring, why are they occurring? Where are they occurring?
(d) Were appropriate and timely actions taken in response to the surveillance data?
(e) Were supervisory visits conducted as planned and follow-up tasks carried out as planned?
(f) Did the community feel that response activities were successful?

(g) Were any actions taken to address health staff requests or suggestions about services or surveillance?
(h) Were appropriate measures taken to prevent similar events?

8.6.7 Identify problems and their causes

If problems occurred, and the district did not meet an expected target, or reach a desired level of performance with any indicator, find out what caused the difference between what was planned and what actually occurred. If a problem is identified, talk with the district team and health facility staff to find out possible causes of the problem.

8.6.8 Update plans for improving the IDSR system

Include in the district plan, successful activities that should continue. Also, include feasible solutions selected as a result of analysis of the year's annual evaluation. Plan to implement the solution. For example:

(a) State the new activity and its objectives.
(b) Specify personnel who will carry out the activity.
(c) Estimate the cost of the activity (if any).
(d) Develop a timetable for the activity. Define the sequence of activities in logical order.
(e) Specify logistics for the new activity (equipment, personnel, transportation, resource allocation).

8.6.9 Provide feedback to health facilities about the evaluation

Provide a report and give feedback to health facilities and others in the district about results of the evaluation activity. State in the feedback report:

(a) what the objectives were for the year;
(b) what was actually achieved;
(c) what the likely reasons were for any differences between what was planned and what was achieved; and
(d) recommended solutions and prioritized activities for improving surveillance and response in the district.

8.7 Annexes to section 8

Annex 8A IDSR core surveillance indicators for health facility level

Annex 8B IDSR core surveillance indicators for district level

Annex 8C IDSR core surveillance indicators for regional/provincial level

Annex 8D IDSR core surveillance indicators for the national level

Annex 8E Monitoring chart for performance of IDSR indicators at health facility level

Annex 8F Monitoring chart for performance of IDSR indicators at district, regional or provincial level

Annex 8G Sample form for recording timeliness and completeness of monthly reporting from health facility to district level

Annex 8H Checklist for supervising surveillance and response activities at health facility

Annex 8I Sample weekly and monthly public health bulletin

Annex 8J Indicators for monitoring performance of IDSR core functions

Annex 8A: Indicators for monitoring IDSR core functions at health facility level

IDSR Core Function	Indicator	Purpose	Numerator	Denominator	Source of information	Target	When to be done
Identify	Availability of Standard-case definition (SCD) and IDSR forms/registers	Correctly identifying and filling cases/events	N/A	N/A	Checklist for person in charge at the H/F	N/A	Quarterly
	Existence of a mechanism to capture unusual or public health events from non-routine sources	Measure the ability of the system to capture unusual events	N/A	N/A	Interviews Health facility log of suspected outbreaks and alerts Event-based electronic platforms	N/A	Monthly
Reporting	Proportion of complete surveillance reports submitted on time to the district	The practice of health facilities in submitting timely surveillance reports to the next level	Number of complete surveillance reports submitted on time to the district	Number of expected surveillance reports from the health facility	Monitoring chart for timely submission of report[4] Electronic reporting platforms	80%	Monthly
	Proportion of cases of diseases targeted for elimination, eradication and any other disease selected for case-based surveillance reported with case-based forms or line lists.	Measures reporting of surveillance data with detailed information to use for further analysis	Number of cases of diseases selected for case-based surveillance reported with case-based forms or line list	Total number of cases of diseases selected for case-based surveillance that occurred in the health facility	Routine summary reports and case-based or line listing reports	80%	Monthly
Analysis and Interpretation	Proportion of priority diseases for which a current line graph is available.	Measures the practice and capacity to analyse surveillance data	Number of priority diseases for which a current line graph is available.	Total Number of priority diseases	Activity checklist for person "in charge" at the health facility and the IDSR summary reporting forms from the health facility	80%	Quarterly
	Proportion of priority diseases for which an updated spot map is available.	Measures the practice and capacity to analyse surveillance data	Number of priority diseases for which an updated spot map is available.	Total Number of priority diseases	The activity checklist for the "in charge" at the health facility and the IDSR summary reporting forms from the health facility	80%	Quarterly
	Proportion of priority diseases for which there is current lab data analysis (if a health facility has a laboratory)	Evidence of routine laboratory data analysis and interpretation	Number of priority diseases for which a current lab data analysis is available.	Total Number of priority diseases	Laboratory register	80%	Quarterly

IDSR Core Function	Indicator	Purpose	Numerator	Denominator	Source of information	Target	When to be done
Investigation and confirmation of suspected outbreaks	Proportion of suspected outbreaks of epidemic prone disease and other PHE notified to the district level within 24 hours of surpassing the epidemic threshold	Measures early detection and timely reporting of outbreaks	Number of suspected outbreaks of epidemic prone diseases notified to the district within 24 hours of surpassing the alert threshold	Total number of suspected outbreaks of epidemic prone diseases in the health facility	Health facility log of suspected outbreaks and alerts	80%	Yearly
	Proportion of specimens from suspected cases within 24 hours of collection**	Measure capacity to refer samples in a timely manner	Number of suspected cases for which samples were sent within 24hrs	Total number of suspected cases	Laboratory register	80%	Yearly
	Proportion of samples of suspect cases whose lab test results are returned within acceptable turn-around-time (TAT)	Measures the functionality of the specimen referral network and the reference lab functionality	Number of samples of suspected cases whose lab test results have returned within the TAT	Total number of samples of suspected cases sent		80%	
Prepare	Availability of key supplies for emergency response (see kit)***	Measure preparedness of a facility	N/A	N/A	H/F Inventory observation	N/A	Quarterly
	Availability of all hazards emergency preparedness and response plan	Measure preparedness of Health facility	N/A	N/A	Annual work plans		Annually
Respond	Availability of a functional Public Health Emergency Management Committee (based on facility staffing and country context) committee (based on facility staffing and country context)	Measure ability to respond at health facility level	N/A	N/A	Minutes from Health Facility records		Quarterly
	Case fatality for each epidemic-prone disease reported	Measure response activities (early treatment seeking behaviour and quality of healthcare services)	Number of deaths from each of the epidemic prone diseases	Number of cases from the same epidemic prone diseases.	Routine reports and outbreak investigation	Depends on disease	
	Attack rate for each epidemic-prone disease reported	Measure response activities	Number of new cases detected	Population at risk	Routine reports and outbreak investigation	Depends on disease	
	Availability of IPC measures in all health facilities including a holding area	Measures ability to prevent nosocomial infections	N/A	N/A	Observation		Annually
	Availability of an isolation facility in all hospitals	Measures ability to effectively manage highly infectious patients	N/A	N/A	Observation		

IDSR Core Function	Indicator	Purpose	Numerator	Denominator	Source of information	Target	When to be done
	Proportion of HCW trained in IPC in last 12 months at the facility	Measures ability to prevent nosocomial infections	Number of HCW trained in IPC in last 12 months at a facility X	Total number expected to be trained	Training reports	80%	
Provide Feedback	Community feedback sessions at least once quarterly	Measures continuous community engagement	N/A	N/A	Community feedback reports		Quarterly
	Proportion of feedback bulletins/reports received from the next higher level	Presence of a feedback mechanism	N/A	N/A	Observation		Quarterly

*** Tracer emergency kit: e.g. Gloves, I.V fluids, medicines masks, aprons, boots, disinfectants, specimen collection kits,

Annex 8B: Indicators for monitoring IDSR core functions at district level

IDSR Core Function	Indicator	Purpose	Numerator	Denominator	Source of information	Target	When to be done
Identifying	Proportion of health facilities with Standard-case definition (SCD)	Correctly identifying and filling cases/events	Number of HF with SCD	Total number of all HF	Checklist for officer in charge at the H/F	100%	Quarterly
	Proportion of health facilities reporting information using EBS	Measures ability of the system to capture unusual events	Number of HF reporting information from EBS	Total number of all HF	Routine summary reports and supervisory reports	80%	Annually
	Proportion of health facilities including hospitals (referral/zonal/specialized) with standardized registers and IDSR forms	Measures availability of registers and IDSR forms	Number of HF with registers and IDSR forms	Total Number of all HF	Checklist for officer in charge at the H/F	100%	Quarterly
Reporting	Proportion of health facilities including hospitals (referral/zonal/specialized) submitting IDSR reports on time to the district	Measures the timeliness of submission of surveillance reports	Number of health facilities that submitted surveillance reports on time to the district	Total Number of health facilities in the district	Monitoring chart for timely submission of report	80%	Monthly
	Proportion of cases of diseases targeted for elimination, eradication and any diseases selected for case-based surveillance reported with case-based forms or line lists.	Measures reporting of surveillance data with detailed information to use for further analysis	Number of diseases targeted for elimination, eradication, and any diseases selected for case-based surveillance reported with case-based forms or line list	Total number of cases of diseases selected for case-based surveillance that occurred in the district	Routine summary reports and case-based or line listing reports for diseases targeted for elimination and eradication and for any diseases selected for case-based surveillance	80%	
	Proportion of hospitals submitting IDSR reports on time	Measures reporting rates of hospitals (referral/zonal/specialized)	Number of hospitals that submitted report on time	Total Number of hospitals	Monitoring chart for timely submission of report[7]	100%	Monthly
Analysis and Interpretation	Proportion of health facilities that have current trend analysis	Measures the practice and capacity of health facility team to detect trends of suspected possible outbreaks	Number of health facilities that have current trend analysis for selected priority diseases	Total number of health facilities in the district	Supervisory report; health facility data analysis tools	80%	Proportion of health facilities that have current trend analysis
	Proportion of health facilities that have current lab analysis data for priority disease analysis (if applicable)	Evidence of routine laboratory data analysis and interpretation	Number of health facilities that have lab data analysis for selected priority diseases.	Total number of health facilities in the district	Laboratory register	80%	Quarterly
	Proportion of priority diseases for which a current line graph is available.	Measures the practice and capacity of district health management team to analyse surveillance data	Number of selected diseases (at least malaria and bacterial meningitis in districts at high risk for meningitis) for which a line graph is available and current.	Total number of selected diseases with a line graph (at least malaria and bacterial meningitis if district is at high risk for meningitis)	Indicator monitoring chart; district analysis book	80%	Quarterly

IDSR Core Function	Indicator	Purpose	Numerator	Denominator	Source of information	Target	When to be done
Investigation and confirmation of suspected outbreaks	Proportion of suspected outbreaks of epidemic-prone diseases notified to the district within 24 hours or surpassing the epidemic threshold	Measures use of data and thresholds for early detection of outbreaks and timely reporting at local level	Number of suspected outbreaks of epidemic-prone diseases notified to the province/region within 24 hours of surpassing the epidemic threshold	Number of suspected outbreaks of epidemic-prone diseases in the district	Log of suspected outbreaks and rumours; district analysis book or other routine analysis tool	80%	
	Proportion of reports of investigated outbreaks that include analysed case-based data	Measures availability of additional variables for further analysis	Number of outbreak investigation reports that include case-based data	Total number of outbreak investigation reports conducted in the district	Investigation report; epidemic curve map; person analysis table; line lists or case-based reporting forms	80%	
	Proportion of investigated outbreaks with laboratory results within 7 days	Measures capacity of laboratory to confirm diagnosis and involvement of laboratory in surveillance activities	Number of investigated outbreaks with laboratory results in a given time period	Total number of investigated outbreaks that occurred in a given time period	Log of suspected outbreaks and rumours; laboratory reports; outbreak investigation reports	80%	
	Proportion of confirmed outbreaks with a nationally recommended public health response	Measures capacity of district to respond to outbreaks	Number of confirmed outbreaks with a nationally recommended response	Number of confirmed outbreaks in the district	Log of suspected outbreaks and alerts; outbreak investigation reports; supervisory reports	80%	
	Proportion of samples from suspected outbreak timely transported within 24 hours	Measures capacity to refer samples in a timely manner	Number of suspected outbreaks of which samples were sent on time (within 24 hours)	Number samples collected from suspected outbreaks	Laboratory register	80%	
Preparing	Presence of a functional central unit for coordination of PHEMC (PH EOC)	Measures district's readiness	N/A	N/A	Minutes of report; annual work plans		Annually
	Proportion of health facilities with emergency preparedness and response (EPR) plans	Measures preparedness of health facility	Number of HF with EPR plans	Number of all HF	Annual work plans		Annually
	Availability of a District Emergency Preparedness and Response Plan	Measures preparedness of district	N/A	N/A	Annual work plans		Annually
	Existence of funds for emergency response (or budget line for emergency funds)	Measures preparedness of health facility	N/A	N/A	Annual work plans		Annually
	Proportion of health facilities that experienced shortage of drugs and supplies for the most recent outbreak (define the time frame e.g. 3, 6, 12 months)	Measures preparedness of health facility	Number of HF that experienced shortage	Total Number of all HF	H/F inventory		

IDSR Core Function	Indicator	Purpose	Numerator	Denominator	Source of information	Target	When to be done
	Proportion of health facilities that have contingency stocks for 3–6 months	Measures preparedness of a facility	Number of HF with contingency stocks	Total Number of all HF	H/F inventory observation		Quarterly
	Proportion of HF with availability of Laboratory diagnostic reagents	Measures capacity of preparedness of HF	Number of HFs with available lab reagents	Total number of health facilities	H/F inventory observation		Quarterly
	Proportion of health facilities with available supplies for specimen collection and transportation	Measures the capacity of preparedness of HF	Number of HFs with available specimen collection and transportation	Total number of Health Facilities	H/F inventory observation		
	Proportion of Labs with performance reports of routine quality assurance	Measures capacity of preparedness of HFs	Number of labs with performance of routine QA	Total Number of Labs	Quality reports		Quarterly
Responding	Presence of a functional Public Health Emergency Management Committee	Measures ability to respond at district level	N/A	N/A	Minutes from district health office		Quarterly
	Proportion of HFs with functional public health emergency management committee	Measures ability to respond at health facility level	Number of HFs with functional committee	Total Number of all HF	Minutes from health facility records		Quarterly
	Availability of public health emergency rapid response team (PHERRT)	Measures ability to respond at health facility level	N/A	N/A	Minutes from district health office		Quarterly
	Case-fatality rate for each epidemic-prone disease reported	Measures quality of case management	Number of deaths from each of the epidemic-prone diseases	Number of cases from the same epidemic-prone diseases	Routine reports and outbreak investigation	Depends on disease	
	Attack rate for each outbreak of priority disease	Helps to identify the population at risk and efficacy of the intervention	Number of new cases of an epidemic-prone disease that occurred during an outbreak	Number of population at risk during the outbreak	Demographic data about the district; outbreaks investigation report with line lists or case-based forms	Depends on disease	
	Proportion of outbreaks or any public health event responded to in the previous 12 months	Measures early detection and timely reporting of outbreaks	Number of suspected outbreaks of epidemic-prone diseases responded	Total number of suspected outbreaks of epidemic-prone diseases/events	Health facility log of suspected outbreaks and alerts	80%	
	Proportion of hospitals with infection prevention and control (IPC) requirements established including isolation ward/unit	Measures the practice and capacity of hospitals to apply infection control requirements	Number of hospitals that reported having established infection prevention and control (IPC) requirements	Total number of hospitals in the district	Routine summary reports and supervisory reports; observation of IPC practices		Annually
Providing Feedback	Availability of feedback reports/letters/bulletin	Presence of a feedback mechanism	N/A	N/A	Observation		Quarterly

IDSR Core Function	Indicator	Purpose	Numerator	Denominator	Source of information	Target	When to be done
	Proportion of feedback bulletins/reports sent to the lower level	Presence of a feedback mechanism	Number of reports/bulletins or any documentation actually sent to lower level and received	Total number of reports/bulletins or any form of feedback document expected to be sent to lower levels	Observation		Quarterly

Annex 8C: Indicators for monitoring IDSR core functions at regional/provincial level

IDSR Core Function	Indicator	Purpose	Numerator	Denominator	Source of information	Target	When to be done
Identifying	Proportions of districts with IDSR guidelines to guide identification of cases	Correctly identifying and filling cases/events	Number of Districts with Guidelines	Total number of all districts	District Inventory	100%	Quarterly
	Proportion of districts reporting information using EBS	Measures ability of the system to capture unusual events	Number of districts reporting information using event-based surveillance methods	Total number of all districts	Routine summary reports and supervisory reports	80%	Annually
	Number of events recorded in the log book of rumour	Measures ability of the region to capture unusual events from unofficial report sources	N/A	N/A	Region logbook		
	Proportion of districts with routine data validation system	Measures routine validation of data	Number of districts having routine data validation system	Total number of all districts	District and regional reports		
Reporting	Proportion of monthly surveillance reports submitted from the district to the region/province on time in the last 3 months	Measures the practice of timely submission of surveillance data	Number of districts that submitted IDSR reports on time to the region/province	Total number of districts that report to the regional/provincial level	Monitoring chart; Routine summary reports	80%	quarterly
	Proportion of diseases targeted for elimination, eradication and any diseases selected for case-based surveillance reported with case-based forms or line lists.	Measures reporting of surveillance data with detailed information to use for further analysis	Number of diseases targeted for elimination, eradication, and any diseases selected for case-based surveillance reported with case-based forms or line list	Total number of diseases targeted for elimination, eradication and any other disease selected for case-based surveillance	Routine summary reports and case-based or line listing reports	80%	quarterly
Analysis and Interpretation	Proportion of districts in which a current line graph is available for selected priority diseases	Measures practice and capacity to analyse surveillance data	Number of priority diseases for which a current line graph is available in districts.	Total Number of districts	Supervisory reports; district analysis book	80%	
	Proportion of districts in which an updated spot map of cases is available for selected priority diseases	Measures practice and capacity to analyse surveillance data	Number of priority diseases for which an updated spot map is available in districts.	Total Number of districts	Supervisory reports; district analysis book	80%	
	Proportion of districts that report laboratory data for diseases under surveillance	Measures if districts are collecting and reporting lab data to higher level	Number of district labs that submitted monthly data to higher level	Total number of district labs	Supervisory reports; district analysis book		

IDSR Core Function	Indicator	Purpose	Numerator	Denominator	Source of information	Target	When to be done
Investigation and confirmation of suspected Cases	Proportion of suspected outbreaks of epidemic-prone diseases notified to the national level within 24 hours of surpassing the epidemic threshold	Measures early detection and timely reporting of outbreaks	Number of suspected outbreaks of epidemic-prone diseases notified to the national level within 24 hours of surpassing the epidemic threshold	Total number of suspected outbreaks of epidemic-prone diseases	Log of suspected outbreaks and alert Routine summary reports	80%	
	Proportion of reports of investigated outbreaks that includes analysed case-based data	Measures availability of additional variables for further analysis including possible risk factors involved	Number of outbreak investigation reports that include epi curve, mapping, personal tables and case-based forms or line lists	Total Number of outbreaks investigation reports	Investigation reports Routine summary reports	80%	
	Proportion of investigated outbreaks with laboratory results	Measures capacity of the laboratory to confirm the diagnosis and involvement of laboratory in the surveillance activities	Number of investigated outbreaks with laboratory results	Total Number of investigated outbreaks	Outbreak investigation reports Laboratory reports Routine summary reports Log of outbreaks and rumours	80%	
	Proportion of confirmed outbreaks with a nationally recommended public health response	Measures capacity of the region/province to respond to outbreaks	Number of confirmed outbreaks with a nationally recommended public health response	Total Number of confirmed outbreaks	Log of suspected outbreaks and alerts Outbreak investigation reports Supervisory visit reports	80%	
	Proportion of labs performing routine testing and reporting of antimicrobial resistance	Measure capacity in readiness	Number of labs reporting AMR results	Total Labs	National Lab Policy Document; Lab register		
Preparing	Presence of a functional coordination of PHEMC (EOC) at regional level	Measure the Regional readiness	N/A	N/A	Minutes of reports, Annual work plans		Annually
	Proportion of districts with established functional Public Health Emergency Management Committee	Measure the Regional readiness	Number of districts with the functional Public Health Emergency Management Committee	Total number of all districts	Supervision reports		Quarterly
	Proportion of districts with emergency preparedness and response plans	Measure preparedness of districts	Number of districts with EPR plan	Total number of all districts	Supervision reports		Annually
	Proportion of districts with Public health risk and resource mapping	Measure the practice and capacity of the district to conduct mapping of available resources and risks	Number of districts that reported having conducted Public health risks and resources mapping	Total number of districts	Risk assessment and mapping reports and resource mapping reports	80%	Annually

IDSR Core Function	Indicator	Purpose	Numerator	Denominator	Source of information	Target	When to be done
	Proportion of districts with funds for emergency preparedness and response	Measures preparedness of district	Number of districts with budgets/budget line	Number of all districts	Annual work plans		Annually
	Proportion of districts that have contingency stocks including lab supplies for 3–6 months	Measures preparedness of district	Number of districts with contingency stocks	Number of all districts	District/region inventory observation	80%	Quarterly
	Proportion of districts labs with performance reports of routine quality assurance	Measures capacity of preparedness	Number of district labs with performance of routine QA	Number of all district labs	Quality assurance reports		Quarterly
Responding	Proportion of districts with functional Public Health Emergency Management Committee (PHEMC)	Measures ability to respond at district/regional level	Number of districts/region with functional committee	Number of districts/regions	Supervisory reports; minutes of meetings of PHEMC		Quarterly
	Proportion of districts with functional public health emergency rapid response team (PHERRT)	Measures ability of region and districts preparedness towards emergencies	Number of districts with functional PHERRTs	Total number of districts	Supervisory reports; minutes of meetings of PHERRT		Quarterly
	Attack rate for each outbreak of priority disease	Helps to identify the population at risk and efficacy of the intervention	Number of new cases of an epidemic-prone disease that occurred during an outbreak	Number of population at risk during the outbreak	Demographic data about the district; outbreak investigation report with line lists or case-based forms	Depends on disease	
	Case-fatality rate for each epidemic-prone disease reported	Measures quality of case management and response to outbreak	Number of deaths from each of the epidemic-prone disease during an outbreak	Total Number of cases from the same epidemic-prone disease during an outbreak	Routine reports and outbreak investigation	Depends on disease	
	Proportion of outbreaks or any public health event responded to in the previous 12 months	Measures early detection and timely reporting of outbreaks	Number of suspected outbreaks of epidemic-prone diseases responded to in the previous 12 months	Total number of suspected outbreaks of epidemic-prone diseases/events in the previous 12 months	Health facility log of suspected outbreaks and alerts	80%	
	Proportion of hospitals with infection prevention and control (IPC) requirements	Measures the practice and capacity of hospitals to apply infection control measures	Number of hospitals that reported having established infection prevention and control (IPC) requirements	Total number of hospitals in the region	Routine summary reports and supervisory n	80%	Annually
Providing Feedback	Proportion of districts with epidemiological bulletin/newsletters/briefs summaries	Presence of a feedback mechanism in the region and districts	Number of districts with epi bulletin	Total number of districts	Supervision reports		

Annex 8D: Indicators monitoring IDSR core functions at national level

Core Surveillance	Indicator	Purpose	Numerator	Denominator	Source of information	Target	When to be done
Identifying	Proportions of districts with IDSR guidelines to identify cases	Correctly identifying and filling cases/events	Number of districts with guidelines	Total number of all districts	District inventory	100%	Quarterly
	Proportion of districts reporting information using EBS	Measures ability of the system to capture unusual events	Number of districts reporting information using event-based surveillance methods	Total number of all districts	Routine summary reports and supervisory reports	80%	Annually
	Number of events recorded in the log book of alerts	Measures ability of national level to capture unusual events from unofficial reported sources	N/A	N/A	National logbook of alerts		
	Proportion of districts with routine data validation system	Measures routine validation of data	Number of districts having routine data validation system	Total number of all districts	National Reports		
Reporting	Proportion of health facilities submitting IDSR reports on time to the district	Measures practice of timely submission of surveillance data from health facilities to district	Number of health facilities submitting reports on time to the district	Number of districts	Summary reporting forms	80%	
	Proportion of monthly surveillance reports submitted from the region/province to the region/province on time in the last 3 months	Measures practice of timely submission of surveillance data	Number of provinces that submitted IDSR reports on time to the region/province	Total number of regions/provinces that report to the national level	Monitoring chart; routine summary reports	80%	quarterly
	Proportion of cases of diseases targeted for elimination, eradication and any diseases selected for case-based surveillance reported with case-based forms or line lists.	Measures reporting of surveillance data with detailed information to use for further analysis	Number of diseases targeted for elimination, eradication, and any diseases selected for case-based surveillance reported with case-based forms or line list	Number of diseases targeted for elimination, eradication and any other disease selected for case-based surveillance	Routine summary reports and case-based or line listing reports	80%	quarterly
Analysis and Interpretation	Proportion of districts in which a current line graph is available for selected priority diseases	Measures practice and capacity to analyse surveillance data	Number of priority diseases for which a current line graph is available in the districts.	Number of districts	Supervisory reports; district analysis book	80%	
	Proportion of regional/provincial laboratories reporting analysed lab data to the national lab	Measures how well regional/provincial levels analyse district laboratory data	Number of provincial laboratories analysing and reporting to NPHL monthly	Total number of provincial labs	National public health laboratory		
	Proportion of districts that report laboratory data for diseases under surveillance	Measures if districts are collecting and reporting lab data to higher level	Number of district labs that submitted monthly data to higher level	Total number of district labs	National log book of records received		
Investigation and confirmation of suspected outbreaks	Proportion of suspected outbreaks of epidemic-prone diseases notified to the national level within 2 days of surpassing the alert threshold	Measures early detection and timely reporting of outbreaks	Number of suspected outbreaks of epidemic-prone diseases notified to the national level within 2 days of surpassing the alert threshold	Total number of suspected outbreaks of epidemic-prone diseases	Log of suspected outbreaks and alerts; routine summary reports	80%	

Core Surveillance	Indicator	Purpose	Numerator	Denominator	Source of information	Target	When to be done
	Proportion of reports of investigated outbreaks that include analysed case-based data	Measures availability of additional variables for further analysis, including possible risk factors involved	Number of outbreak investigation reports that include epi curve, mapping, personal tables and case-based forms or line lists	Number of outbreak investigation reports	Investigation reports; routine summary reports	80%	
	Proportion of investigated outbreaks with laboratory results	Measures capacity of laboratory to confirm diagnosis and involvement of laboratory in surveillance activities	Number of investigated outbreaks with laboratory results	Number of investigated outbreaks	Outbreak investigation reports; laboratory reports; routine summary reports; log of outbreaks and rumours	80%	
	Proportion of confirmed outbreaks with a nationally recommended public health response	Measures capacity of region/province to respond to outbreaks	Number of confirmed outbreaks with a nationally recommended public health response	Number of confirmed outbreaks	Log of suspected outbreaks and alerts; outbreak investigation reports; supervisory visit reports	80%	
	The number of epidemics detected at national level, but were missed by district level	Checks the capacity of the entire health system to detect epidemics, and shows that national level is checking whether districts are observing trends	Number of epidemics detected by the regional or national level from analysing district-specific data	Total number of epidemics reported by districts	District summary reporting forms; district analysis book supervisory reports; standard surveillance reports	zero	
Preparing	Presence of a functional coordination of PHEMC (PH EOC) at national level	Measures national level readiness	N/A	N/A	Minutes of meeting;, annual work plans		Annually
	Proportion of regions/provinces with established functional coordination mechanism/body for public health epidemics/emergency	Measures regional/provincial readiness	Number of regions/provinces with the functional mechanism body for coordination of public health emergencies	Total number of all regions/provinces	Supervision reports		Quarterly
	Proportion of regions/provinces with emergency preparedness and response (EPR) plans	Measures preparedness of regions/provinces	Number of regions/ provinces with EPR plan	Total number of all regions/ provinces	Supervision reports		Annually
	Proportion of regions/provinces with public health risks and resources mapped	Measures practice and capacity of the regions/provinces to conduct mapping of available resources and risks	Number of regions/provinces that reported having conducted Public health risks and resources mapping	Total number of regions/provinces targeted for public health risks and resource	Risk assessment and mapping reports and	80%	Annually
	Proportion of regions/provinces with funds for emergency preparedness and response	Measures preparedness of regions/provinces	Number of regions/provinces with budgets/budget line	Number of all regions/provinces	Annual work plans		Annually
	Proportion of regions/provinces that have contingency stocks, including lab supplies for 3–6 months	Measures preparedness of regions/provinces	Number of regions/provinces with contingency stocks	Number of all regions/provinces	District/Region inventory observation	80%	Quarterly

Core Surveillance	Indicator	Purpose	Numerator	Denominator	Source of information	Target	When to be done
	Proportion of regions/provinces labs with performance reports of routine quality assurance	Measures capacity of preparedness	Number of regional/provincial labs with performance of routine QA	Number of regional/provincial labs	Quality reports		Quarterly
Responding	Proportion of regions/provinces with functional Public Health Emergency Management committee	Measures ability to respond at regional/provincial level	Number of regions/provinces with functional committee	Number of regions/provinces	Supervisory reports		Quarterly
	Proportion of regions/province with functional PHERRT	Measures ability of regional/provincial preparedness	Number of regions/provinces	Total number of regions/provinces	Supervisory reports		Quarterly
	Attack rate for each outbreak of priority disease	Helps to identify the population at risk and efficacy of the intervention	Number of new cases of an epidemic-prone disease that occurred during an outbreak	Number of population at risk during the outbreak	Demographic data about the district; outbreaks investigation report with line lists or case-based forms	Depends on disease	
	Case-fatality rate for each epidemic-prone disease reported	Measures quality of case management	Number of deaths from each of the epidemic-prone diseases	Number of cases from the same epidemic-prone diseases	Routine reports and outbreak investigation	Depends on disease	
	Proportion of outbreaks or any public health event responded to in the previous 12 months	Measures early detection and timely reporting of outbreaks	Number of suspected outbreaks of epidemic-prone diseases responded	Total number of suspected outbreaks of epidemic-prone diseases/events	Health facility log of suspected outbreaks and alerts	80%	
	Proportion of Hospitals with infection prevention and control (IPC) requirements	Measures practice and capacity of hospital to apply infection control measures	Number of hospitals that reported having established infection prevention and control (IPC) requirements recorded	Total number of hospitals in the country	Routine summary reports and supervisory reports	80%	Annually
Providing feedback	Proportion of regions/provinces with epidemiological bulletin/newsletters/briefs summaries	Presence of a feedback mechanism	Number of regions/provinces with epi bulletin	Total number of regions/provinces	Supervision reports		

Annex 8E: Monitoring Chart for performance of IDSR indicators at health facility level

Instructions:

Use this chart to keep track of the health facility's performance with those indicators relevant to health facility performance for IDSR.

Each month, summarize and compile health facility's summary data for priority diseases. Report the summary data to the district level on time. Record on this chart the indicator results. Share this chart with the district supervisor during a visit to the health facility, or bring it to the quarterly district meeting.

Indicator	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Availability of SCD and IDSR forms/registers												
Existence of a mechanism to capture unusual or public health events from non-routine sources												
Proportion of complete surveillance reports submitted on time to the district												
Proportion of cases of diseases selected for case-based surveillance, which were reported to the district using case-based or line listing forms												
Proportion of priority diseases for which a current line graph is available												
Proportion of priority diseases for which there is current lab data analysis												
Availability of emergency preparedness and response plan												
Availability of supplies for specimen collection and transportation												
Availability of contingency stocks												

Indicator	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Proportion of suspected outbreaks of epidemic prone diseases notified to the district level within 24 hours of crossing the epidemic threshold												
Proportion of samples from suspected outbreak timely transported for lab investigation												
Availability of a functional epidemic preparedness committee												
Case Fatality rate for each epidemic-prone disease reported												
Proportion of suspected outbreaks of epidemic-prone disease notified to the district level within 24 hours of crossing the epidemic threshold												
Availability of an isolation facility												
Attack rate for each epidemic-prone disease reported												
Availability of community feedback reports												
Proportion of feedback bulletins/reports received from the next higher level												
Reply YES or NO to the following checklist items												
Were surveillance reports submitted on time?												
Are trend graphs up-to-date?												
If YES, have you observed any changes in the trends?												
If YES, has the threshold been crossed?												
If YES, have you taken action to alert the district?												

ANNEX 8F: Monitoring chart IDSR performance indicators at district, regional or provincial level

District/Region/Province:_____**Year:**_____

Indicator	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Proportions of Health facilities with SCD												
Proportion of districts/regions reporting information using EBS												
Proportion of health facilities within the district with standardized registers and IDSR forms												
Number of events recorded in the district log book for rumours												
Proportion of health facilities submitting IDSR reports on time to the district												
Proportion of cases of diseases targeted for elimination, eradication and any diseases selected for case-based surveillance reported with case-based forms or line lists.												
Proportion of hospitals submitting IDSR reports on time												
Proportion of priority diseases for which a current line graph is available												
Proportion of health facilities that have current trend analysis												
Proportion of health facilities that have current lab analysis data for priority diseases analysed												
Proportion of suspected outbreaks of epidemic-prone diseases notified to the regional/provincial level within 24 hours or crossing the epidemic threshold												
Proportion of reports of investigated outbreaks that include analysed case-based data												
Proportion of investigated outbreaks with laboratory results												
Proportion of confirmed outbreaks with a nationally recommended public health response												

Indicator	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Proportion of samples from suspected outbreaks timely transported to laboratory for investigation												
Presence of a functional central unit for coordination of PHEMC (PH EOC)												
Proportion of health facilities with emergency preparedness and response plans												
Availability of a District Emergency Preparedness and Response Plan												
Proportion of HF with a functional epidemic preparedness plan committee												
Availability of Public Health Emergency Rapid Response Team (PHERRT)												
Case-fatality rate for each epidemic-prone disease reported												
Attack rate for each outbreak of priority disease												
Proportion of outbreaks or any public health event responded to in time the previous 12 months												
Proportion of hospitals with isolation facilities												
Availability of feedback reports/letters/bulletin												
Proportion of feedback bulletins/reports sent to the lower level												

Note: Please compute the actual percentage for each cell

Annex 8G: Sample form for recording timeliness and completeness of monthly reporting from health facility to district level

Country:_____**District:**_____

Health Facility: _____**Year:**_____

Indicator	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Total number of reports expected (N)												
Total reports sent on time (T)												
Total reports sent late (L)												
Total number of reports not received (W)												
Timeliness of reports =100 * T / N												
Completeness of reporting =100 * (N-W) / N												

Legend

T = arrived on time

L = arrived late

W=report not received

*Timeliness and completeness are expressed as percentages (%). When the surveillance system is good, the rates for timeliness and completeness should approach 100%. This table allows for monitoring progress of these two indicators in the district so that action can be taken to improve timeliness for each health facility in the district.

Annex 8H: Checklist for monitoring IDSR activities at the health facility

Health Facility: _____ **Date of Supervisory Visit:**_____

ACTIVITY	SUPERVISORY QUESTION	ANSWER	COMMENT (What Caused Problem)
Data collection to identify suspected cases within health facilities	1. How often do you collect information from the community about reports of suspected cases or deaths due to a priority disease or condition?		
Registering cases	1. Are diagnoses of cases of priority diseases recorded in the clinic register according to the standard-case definition?	Yes [ ] No[ ]	
Reporting	1. Do health staff use a standard-case definition to report the suspected cases and outbreaks? 2. Do you record information about immediately notifiable diseases on a case form or line list?	Yes [ ] No [ ] Yes [ ] No [ ]	
Analysing and interpreting	1. Do you plot the number of cases and deaths for each priority disease on a graph? (Ask to see the health facility's analysis book. Check whether trend lines are up-to-date.) 2. Do you plot distribution of cases on a map?	Yes [ ] No [ ] Yes [ ] No [ ]	
Investigating and confirming reported cases and outbreaks	1. If an epidemic-prone disease was suspected, was it reported immediately to the district office? 2. For cases of priority diseases needing laboratory tests seen since the last supervisory visit, how many had laboratory results? 3. Are appropriate supplies available or set aside for collecting laboratory specimens during an urgent situation? May I see the supplies?	Yes [ ] No [ ] Number of results obtained: Number of expected cases seen: Yes No	

ACTIVITY	SUPERVISORY QUESTION	ANSWER	COMMENT (What caused problem)
Responding	1. Are appropriate supplies available for responding to a confirmed case or outbreak (for example, immunization supplies and vaccine, ORS, antibiotics, and so on)? 2. Please show me the supplies for carrying out a recommended response. 3. Who is the outbreak coordinator for this facility? 4. How often do you provide information and training in outbreak response to the staff of this facility?	Yes [ ] No [ ] Supplies seen Yes [ ] No [ ] Name: Designation : Training is done : 	
Providing feedback	1. How often do you report information to the community? 2. Do you receive the latest bulletin from the (central, subnational) level?	Report it Yes [ ] No [ ]	
Evaluating and improving the system	1. Were the last 3 routine monthly reports sent to the district office? 2. Were the last 3 routine monthly reports sent on time?	Yes [ ]No [ ] Yes [ ] No [ ]	
Epidemic preparedness	1. What precautions do health staff (including laboratory staff) take routinely with all patients regardless of the patients' infection status? 2. How do you estimate the number of supplies to set aside for use during an emergency situation?	Minimum level of standard precautions: How supplies are estimated: 	

Annex 8I: Sample weekly and monthly public health bulletin

Integrated Disease Surveillance and Response Bulletin

Republic of Liberia

World Health Organization

INTEGRATED DISEASE SURVEILLANCE AND RESPONSE BULLETIN

Week-9 Feb 29 – March 6, 2016 Data Source: CSOs from 15 Counties

Highlights during the reporting week

- Fifteen out of eighteen samples sent to the laboratory this week were confirmed positive for measles.
  - Of these, six were from Bushord Island district (Montserrado), three cases each were from Mamba Kaba and Kakata districts (Margibi), two from district #4 and one was from Buchanana districts (Grand Bassa). Two tested negative and one was equivocal.
- Three cases of suspected Lassa fever from Nimba and Bong County were confirmed positive. An outbreak investigation is ongoing and neighboring counties have been informed.
- A total of five maternal deaths were reported from Montserrado, Nimba and Grand Cape Mount counties.
- A total of eight neo-natal deaths were reported from Bong, Montserrado, Nimba, Lofa and Grand Bassa counties.
- Four AFP cases were reported from Bomi, Lofa and RiverGee counties.

Reporting Coverage

- 98% (716/724) of expected health facilities reported from 91 health districts across 15 counties.

Table 1: Reporting coverage (completeness) and timeliness of reporting from counties, week 9

County	No. of expected report from health facility	No. of reports received	Completeness (%)	On time
Bomi	22	22	100.0	Yes
Bong	42	42	100.0	Yes
Grand Cape Mount	31	31	100.0	Yes
Gbarpolu	14	14	100.0	Yes
Grand Bassa	30	30	100.0	Yes
Grand Gedeh	24	24	100.0	Yes
Grand Kru	19	18	94.7	Yes
Lofa	59	59	100.0	Yes

Sample Monthly Public Health Bulletin

THE UNITED REPUBLIC OF TANZANIA

IINISTRY OF HEALTH COMMUNITY DEVELOPMENT GENDER, ELDERLY AND CHILDREN

EPIDEMIOLOGY AND DISEASE CONTROL SECTION

INTEGRATED DISEASE SURVEILLANCE AND RESPONSE (IDSR)

MOTHLY EPIDEMIOLOGICAL BULLETIN March 2017

Highlights of the month

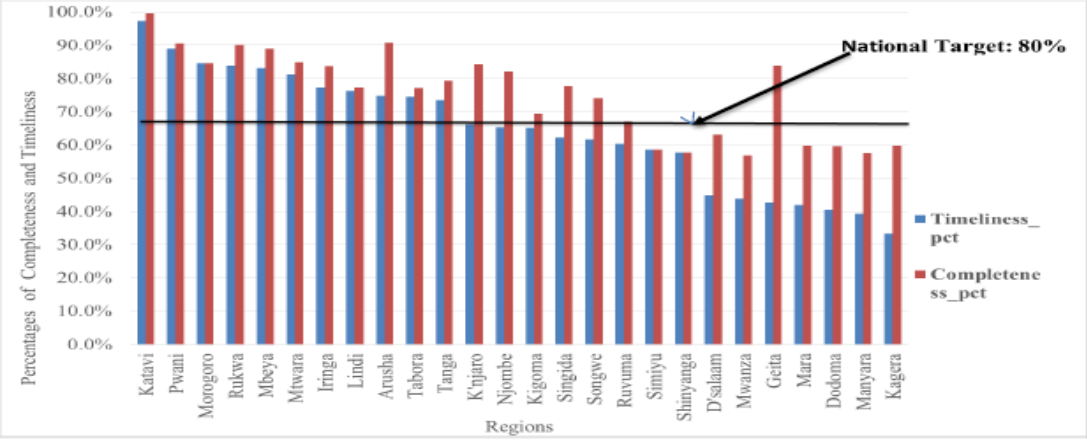
- All the 26 regions submitted reports to the national level in March, the average timeliness and completeness was 64.3% and 75% respectively, whereby 12 regions reached the national target of >80%, which is an increment compared to the month of February, whereby only 5 regions reached the national target.
- Cholera cases continued to be reported
  - 220 suspected cholera cases and 2 deaths from 5 regions [Mara-48, Dar es salam-25, Iringa-18, Tabora-7 and Kigoma-5].
- Twelve (12) suspected cases of Acute Flaccid Paralysis (AFP) were reported from 4 regions [Katavi-2, Tanga-2 Mtwara-1, and Simiyu-1], however all the cases tested negative
- Nineteen (19) cases of Measles reported from 5 regions [Tanga-14, Pwani-2, Iringa-1, Mbeya-1 and Katavi-1], however, all cases tested negative.
- 304 cases of Acute Respiratory Syndrome (SARI) were reported from Kigoma-179, Tanga-9, and Mtwara-16.Out of 121samles taken, 10 tested positive for influenza.
- Three(3) suspected cases of Keratoconjuctiivitis were reported from Simiyu-2 and Njombe -1 regions
- 1,131 cases of Diarrhea with blood of under-fives reported from 16 regions[Mtwara-162, Kigoma-151, Tanga-140, Rukwa-134, Lindi-118, Mbeya-91, Morogoro-91, Njombe-55, Songwe-55, Iringa-41, Katavi-34, Ruvuma-25, Shinyanga-20, Simiyu-10, Pwani-3 and Dar es salaam-1] reported
- A total of sixty six (66) maternal deaths were reported in the month. The deaths were reported from Rukwa-2, Tanga-1 Shinyanga-4, Kigoma-5, Simiyu-5, Pwani-2, Dar es salaam-5, Ruvuma-1, Morogoro-7, Singida-1, Dodoma-1, Tabora-1, Iringa-5, Lindi-3, Manyara-2, Mtwara-4, Arusha-3, Mara-2 and Mbeya-1 regions. The common causes of death reported were PPH (50%), Eclampsia (12%) and Ruptured uterus (10.4%)
- Investigation was done at Buhigwe district in Kigoma responding to reported outbreak of unknown disease, the results of the investigation revealed that it was an upsurge of malaria cases co-infected with various enteric pathogens.

Figure 1: Map showing the incidence of conditions March. 2017

KEY

Ψ	Cholera	▲	Rabies
ǂ	Rift valley fever	Δ	Animal bite
■	CSM	ξ	AFP
♦	Tripanosomiasis	♣	Keratoconjivitis
θ	Measles	☻	SARI
☼	Anthrax	∞	Neonatal tetanus
■	Diarrhea with Blood		

Figure 2: Completeness and Timeliness of Facility Reporting by Region, Week 9th - 12th-, March, 2017



12 Regions Katavi, Pwani, Rukwa, Mbeya, Mtwara, Morogoro, Iringa, Lindi, Arusha,Tabora, Tanga and Kilimanjaro reached the target of 80% and above for completeness and timeliness . No region reported with completeness of less than 50% in March though some regions reported timeliness of less than 50% which include ; Dar es salam, Kagera, Mwanza, Manyara, Geita, Manyara and Dodoma. Generally from week 9 to week 12 the average completeness and timeliness of reporting was 75.0% and 64.3% respectively.

Completed, Ongoing and Planned activities under IDSR

- Supervision was done in Singida, Dodoma and Dar es salaam. Supervision in Manyara and Geita planned for April 2017.
- Training of FELTP basic course was conducted in Mwanza and Mara region in March
- Supervision of Avian Influenza sentinel sites in Mwaza was conducted in March
- Avian Infulenza table top simulation exercise was conducted in Bagamoyo coordinated by EPRS
- Outbreak Investigation for unknown disease at Buhigwe district in Kigoma region was conducted
- Community based surveillance training for Community health care workers planned for May, 2017 in Dodoma, Mara and Mwanza
- e-IDSR training in Kigoma planned for May, 2017
- Monthly Press Release on Cholera was done by the Hon. Minister

Annex 8J: Indicators for monitoring performance of core functions of Integrated Disease Surveillance and Response

1. Proportion of health facilities submitting weekly (or monthly) surveillance reports on time to the district.
2. Proportion of districts submitting weekly (or monthly) surveillance reports on time to the next higher level.
3. Proportion of cases of diseases targeted for elimination, eradication and any other diseases selected for case-based surveillance that were reported to the district using case-based or line-listing forms.
4. Proportion of suspected outbreaks of epidemic-prone diseases notified to the next higher level within 24 hours of crossing the epidemic threshold.
5. Proportion of health facilities in which a current trend analysis (line graph or histogram) is available for selected priority diseases.
6. Proportion of districts in which a current trend analysis (line graph or histogram) is available for selected priority diseases.
7. Proportion of reports of investigated outbreaks that include analysed case-based data.
8. Proportion of investigated outbreaks with laboratory results within 7 days.
9. Proportion of confirmed outbreaks with a nationally recommended public health response within 24 to 48 hours of notification **(target >80%).***
10. Case-fatality rate for each epidemic-prone disease reported.
11. Attack rate for each outbreak of a priority disease.
12. The number of epidemic detected at the national level that were missed by the district level during the last year.
13. Proportion of selected laboratories that are reporting monthly laboratory data for priority diseases under surveillance.
14. Proportion of district laboratories that received at least one supervisory visit that included written feedback from the provincial or national level during the last year.

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* **What constitutes Response standards within 24 to 48 hours**

1. Conduct initial rapid assessment/situation analysis
2. Inform WHO of the outbreak/public health event
3. Activate country emergency response structures and assign critical functions
4. Initiate response activities using a pillar approach
5. Convene first multisectoral emergency coordination meeting
6. Develop an initial response strategy, objectives and action plan
7. Issue initial internal situation report (sitrep)

8.8 References

1. The IHR Review Committee on Second Extensions for Establishing National Public Health Capacities and on IHR Implementation (WHA 68/22 Add.1).
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3. WHE-IDSR KPI results. June 2017.
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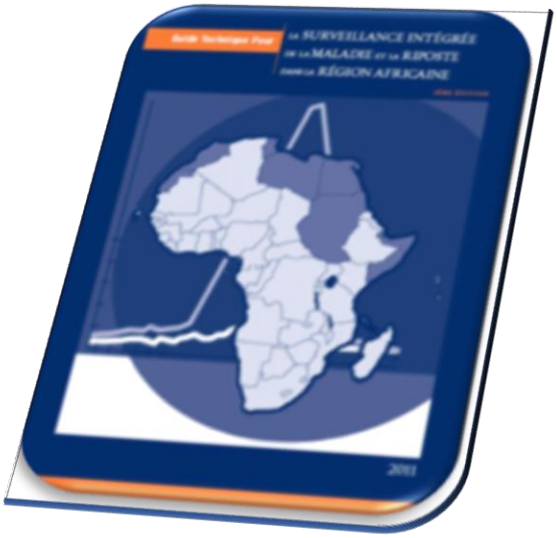
INTEGRATED DISEASE SURVEILLANCE AND RESPONSE TECHNICAL GUIDELINES

THIRD EDITION



MODULE 9: ELECTRONIC INTEGRATED DISEASE SURVEILLANCE AND RESPONSE (eIDSR)

MARCH 2019

MODULE 9: ELECTRONIC INTEGRATED DISEASE SURVEILLANCE AND RESPONSE (eIDSR)

9. ELECTRONIC IDSR (EIDSR)

Electronic IDSR (eIDSR) is the application of electronic tools to principles of IDSR to facilitate prevention, prediction, detection, reporting and response. It is based on:

a) standardized interoperable and interconnected information systems administered within the national context; and

b) rapid collection, analysis, reporting and use of disease/events data in real time for appropriate public health action.

Using paper-based tools for implementation of IDSR has been an instrumental strategy for strengthening public health surveillance in the African Region since IDSR was adopted in 1998. With the adoption of the International Health Regulations IHR (2005), which requires countries to strengthen capacity for disease surveillance and response, application of electronic tools to enhance real-time surveillance can improve timeliness of outbreak detection.

In recent years, technological and analytical innovations have emerged as an approach which can be used to facilitate rapid transmission of public health surveillance information, thus aiding timely detection of and response to outbreaks and other public health events. Application of e-tools in the health sector has the potential to provide real-time validated data for public health surveillance, investigation and prompt outbreak response. eIDSR provides new opportunities for accelerating achievement of the IHR (2005) core capacities.

9.1 eIDSR in the context of HMIS Health Management

Health Management Information Systems (HMIS) are used by countries to facilitate routine collection of data to support planning, management and decision-making in health service provision. HMIS routinely collect data about diseases, events and conditions, as well as other administrative and service-provision data. The primary source of these data is the health facility outpatient (OPD) or inpatient (IPD) register. The most widely used electronic platform of HMIS is DHIS2. It is used in low- and middle-income countries. In Africa, it has coverage of more than 30 countries.

In both HMIS and eIDSR, source data are derived from health facility OPD or IPD registers. eIDSR is an enabling platform for reporting in real time for IDSR priority diseases. In the eIDSR

platform, there is an active and timely means of collecting data on IDSR priority diseases, and conditions which are extracted from either OPD or IPD registers, including patients' folders, and they are reported immediately, weekly or monthly.

9.2 eIDSR in the context of eHealth

In 2013, the African Region adopted an eHealth resolution (AFR/RC60/R3) to address the use of Information and Communication Technologies (ICT) for health and health-related fields, including disease surveillance. Recommended actions of the resolution included development of national policies, strategies, norms and appropriate governance mechanisms resulting in long-term strategic plans and frameworks for eHealth capacities in countries. eHealth encompasses a range of services and systems, including:

(a) health and medical informatics;
(b) tele-health, which means transmission of health-related services or information over the telecommunications infrastructure;
(c) e-learning which means using technologies to access education outside of the traditional classroom; and
(d) m-health, which is a general term for use of mobile phone and other wireless technologies in medical health.

Member States echoed the same sentiment in the recent Seventy-first World Health Assembly, and unanimously agreed that digital health solutions should complement and enhance existing health service delivery models. Subsequently, they adopted the new resolution on Digital health, which underscores the importance of nationally-supported digital health strategies, supporting and investing in the digital health enabling environment (including policy, standards, capacity, interoperability, privacy and security, and more), and transitioning to sustainability and government ownership.

Digital health, which is sometimes called eHealth, provides cost-effective and secure use of ICTs in health and health-related fields. Digital health, as defined by the Broadband Commission for Sustainable Development, is an umbrella term that encompasses all concepts and activities at the intersection of health and information and communications technologies (ICTs). This includes delivery of health information, using ICTs to improve public health services, and using health information systems to capture, store, manage or transmit information on patient health or health facility activities. ICTs are defined as tools that facilitate communication, and processing and transmission of information by electronic means, and these encompass a full range of tools like radio and television to telephones (fixed and mobile), computers, and the Internet.

eIDSR, which is part of eHealth, is one of the essential innovations for implementation of recommendations of the WHO Regional Committee for Africa on use of information

technology, which is core in achieving IHR (2005) requirements by countries. Standardization of electronic tools, and sustained infrastructure across the Region will promote easy generation and sharing of country and regional profiles of priority diseases, conditions and events.

9.3 Rationale of eIDSR

Limitations of the current approaches to IDSR data collection and transmission are attributed to the fact that many countries still use manual procedures and paper-based methods to collect and transmit data. Submitting and transmitting data on time is a challenge, as health workers have to travel long distances on difficult terrains to submit their files. This leads to delays in getting information on time for action, especially in the event of a suspected outbreak.

The eIDSR system aims to facilitate the work of every staff member in a health system, by improving disease surveillance using electronic tools, and hence strengthening surveillance and response capacities, while, in the long term reducing morbidity and mortality due to epidemic-prone diseases as well as other public health events.

eIDSR is thus likely to improve the following:

(a) Timeliness and completeness of reporting
(b) Early detection, investigation, and response to outbreak or public health events
(c) Manual data entry that is prone to errors
(d) Systematic information sharing across levels and sectors
(e) Combining data streams
(f) Data use, analysis, analytics

Recently, there have been various supporting initiatives and resolutions, regionally and globally, which have recognized the potential of digital technologies to advance the Sustainable Development Goals (SDGs), and particularly to support health systems in all countries in health promotion and disease prevention. The eIDSR is, hence, developed to reflect the following recently adopted overarching frameworks:

(a) Integrated Disease Surveillance and Response ((AFR/RC/48.8)
(b) IHR (2005) (WHA58.3)
(c) Regional Strategy for Health Security and emergencies strategy (AFRO/RC66/6)
(d) eHealth resolution and decision (WHA58.28)
(e) Digital health (WHA71.7)

9.4 Benefits of eIDSR

The eIDSR provides real-time information for immediate action. Potential benefits of eIDSR include:

(a) Early alert and detection

With eIDSR, the speed of outbreak detection can be improved, as information may be more rapidly captured, and in some cases, the time and place of an outbreak can be predicted with varying degrees of accuracy, thus enabling opportunities for prevention and control *(Refer to a study done by CDC. 2008b. Potential effects of electronic laboratory reporting on improving timeliness of infectious disease notification—Florida, 2002–2006. Morbidity and Mortality Weekly Report 57(49):1325–1328. http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5749a2.htm)*

(b) Timely reporting

eIDSR tools allow rapid and timely transmission of data from lower primary reporting units to subsequent higher levels to enable appropriate public health action

(c) Standardization of data

Standardization of tools in the eIDSR system enables data collection to be more consistent and complete for ease of data exchange and comparison across health facilities.

(d) Better data transmission and management including storage

(i) A major challenge of paper-based data is a need to compile reports from various sources and provide reports to higher level offices at regular intervals and to different administrative levels. Moreover, data storage and transport can be difficult, and there is a risk of data damage and loss.

(ii) With eIDSR there is faster data transmission, and moreover, data are also organized into a format that is more accessible for use and interpretation.

(e) Interoperability and sharing of data

eIDSR provides an opportunity for exchange and use of information across entities, especially if standards and workflow have been well developed for the eIDSR system to allow interoperability with other information systems.

(f) Automated transmission, analyses and improved quality data

(i) Paper-based reporting runs the risk of omitting valuable information when reporting to higher administrative levels.

(ii) eIDSR reduces the number of data entry errors and facilitates automated data analysis, thus saving considerable effort for health staff.

(g) Ultimate contribution towards good response, better monitoring and evaluation

eIDSR provides a platform for data storage and automatic analysis across health facilities for better monitoring and evaluation of various public health interventions.

(Studies done by Valenciano et al, 2003 and 2003; Pinto el al 2005 which demonstrated that the simple advance of a computerized reporting system using country-identified thresholds for priority diseases did show improvements in monitoring trends and predicting outbreaks in a matter of weeks post-implementation)

(h) Cost reduction

eIDSR makes for early detection of disease outbreaks, which in effect, can contribute to overall reduction of high costs associated with management of these outbreaks.

9.5 Key guiding principles in establishing eIDSR

The following are key guiding principles for establishing eIDSR:

(a) **Use of existing infrastructure:** As much as practicable, eIDSR should be built on existing framework and systems, such as paper-based IDSR, HMIS, DHIS2, etc. This enables easy adaptability by implementers, and promotes smooth transitions. In the event infrastructure already exists, eIDSR introduction may possibly not require major customization, which might be costly.

(b) **Standardization:** Standardization of data and electronic tools will promote uniformity in data collection and aggregation. Standardization promotes comparison between various levels of the health systems, and between countries.

(c) **Integration:** IDSR is built on the premise of integration, and so eIDSR should be implemented in the spirit of integration. This could entail integration of various data sources and information systems from other health programmes (e.g. malaria, EPI, cancer registry, noncommunicable diseases etc.) into a common platform or data warehouse.

(d) **Interoperability:** It is the ability of different health information systems to work together within and across organizational boundaries to exchange data and use information that has been exchanged. It is important for standards and workflow that eIDSR developers put together to be easily interoperable with other information systems.

(e) **Multisectoral collaboration:** It is essential to collaborate with stakeholders, such as telecom companies. Such collaboration could be in the form of waivers, corporate social responsibility, and partial tax holidays etc. Effective collaboration could accelerate eIDSR roll-out and coverage. Collaboration with other sectors like animal and environment is also key, as this will facilitate efficient utilization of scarce resources, effective and prompt leveraging of various sector capabilities for better disease prevention and control.

(f) **Near real-time approach:** Every effort should be made to ensure provision of near real-time transfer of information about events incorporated into the design and implementation of eIDSR. This should be a long-term goal and countries will have to start slowly with planning and developing in phases.

(g) **One Health:** The One Health approach offers an innovative approach where various disciplines work together to address health at the human-animal-environment interface. In view of the fact that majority of emerging and re-emerging infections are often zoonosis, and responsible for large outbreaks in recent times, maintaining a focus on diseases that affect both humans and animals is a worthwhile investment.

(h) **Data security:** Protection of health information is essential in every health information system. Security of data will ensure that information is only accessible by authorized personnel, who need to take action. It also promotes ethical handling of data. Caution should be taken to ensure there are processes for patient privacy.

(i) **User-friendly system:** The system should ideally be simple enough to be used by staff at all levels. It should be easy to log on, input and receive information. The system should also be flexible to adapt to change of disease and event profiles over time.

9.6 eIDSR development and implementation Process

Developing an eIDSR system should be planned carefully, with all relevant stakeholders getting involved. The system should fit capabilities and needs of the country, and a plan for securing resources should be developed prior to initiating eIDSR.
The most important considerations for the process of developing and implementing eIDSR are shown below. Depending on the country, more considerations may need to be made. Countries need also to ensure that they are ready to embark on eIDSR, by weighing the costs and benefits and also assessing eIDSR feasibility options in their county.

9.6.1 Process for establishing eIDSR

(a) Engage stakeholders and establish technical working group

(i) The success of eIDSR requires an effective engagement of all relevant stakeholders.

(ii) When initiating an eIDSR system, the surveillance group should engage with the department that handles the health information system. These two departments should bring together all relevant stakeholders in the country to develop a technical working group required for coordinating eIDSR implementation. Potential members of this technical working group (TWG) could include national telecommunications; ministries responsible for information, communication and technology; laboratory personnel; a clinician; representatives of other relevant ministries and institutions; national public health informatics experts; mobile

phone companies; internet companies, and partners. Composition of the TWG will depend on the context of a given country. This body should also assume the role of resource mobilization.

(iii) eIDSR may need to leverage ICT capacity provided by other line ministries, especially ministries with oversight of ICT. Ministries of health should seek ways to engage with ministries in charge of ICT to ensure there is appropriate ICT coverage and governance of eHealth.

(b) Assess country IDSR functionality

IDSR functionality needs to be assessed at all levels, including political commitment to use ICT as a pivot of development and social transformation. The ministry of health needs to make electronic disease surveillance a priority, and establish an epidemics and infectious diseases (EID) division to follow up on implementation of disease surveillance activities. Appointing a disease surveillance focal point at district level is a key point in the success of eIDSR implementation.

(c) Determine country capabilities and needs

(i) A crucial step in the development of an electronic system is to assess capabilities and infrastructure needs of the country. The eIDSR technical working group or a similar TWG, which oversees surveillance activities, should carefully consider capabilities and infrastructure and resources against country needs with regard to their surveillance system. WHO has developed a standardized eSurveillance assessment tool, which may also be used as a resource tool.

(ii) Network coverage

- Assessing network capability of a country is a critical step in determining the type of system that can be developed. Internet and mobile network coverage is a key component to consider.
- Internet: number of providers; cost of subscription; internet speed; internet coverage in all areas of the country; national level connectivity; and district level connectivity.
- Mobile: number of providers; cost of text messaging; cost of phone calls; provider coverage in all areas of the country; distribution of providers by customers; common operating systems (android/iOS).
- Explore also alternative sophisticated models to extend connectivity, such as TV white space, and balloon-, drone-, or low-orbiting satellite-based Internet connectivity to extend coverage in remote or hard-to-reach areas. Some of these options can be done using public–private partnership.

(iii) Power supply option

- Availability of power supply is key to a successful eIDSR. Reliable power supply to suit the needs of the system must be available at the level of implementation.

- Countries should determine available and potential power supply options for each level of the health system, in all geographic areas. For example, connection to the power grid; consistent generator with fuel provision; consistent generator but no fuel provision; inconsistent generator or inconsistent fuel; power banks, or solar power.
- Countries may, in addition, consider seeking alternative models to ensure reliable power. Solar panels, for example, could be outfitted to key government ministries, prioritizing those responsible for managing critical data sets in emergencies, and to district health facilities.

(iv) Equipment – data capture, data management, data analysis

- Equipment is an essential component of eIDSR. It is important to assess the equipment available for eIDSR in a given country at each level of the health system. If equipment is not available, the feasibility of using options for each type of equipment should be considered.
- You should also consider the lifecycle of all of your hardware, and ensure you develop a plan for replacing/renewing hardware as needed.

(v) Hardware –

- Consider how to address housing of data on servers; will servers be cloud-based (easier maintenance but monthly/yearly payment)? Consider also where service will be housed i.e. physical structure (requires cool room with consistent power); potential costs, including initial/setup and ongoing, must be considered;
- Consider types of computers and quantities required. Note that desktop computers are cheaper, but must have power; laptops are portable, but expensive; and tablets are portable and convenient;
- Consider types of mobile devices required, including smart phones;
- Consider availability of power and how you will ensure uninterrupted power supply.

(vi) Software for surveillance or similar function

- Is any software already being used for other surveillance in the country that could be leveraged?
- Is there a need to develop? Countries may consider open-source software that can be customized, or commercial off-the-shelf software.
- Partnerships between system developers are key in developing software which could be flexible and easily adaptable;
- Countries need to evaluate software that could be adopted or adapted to their particular surveillance needs;
- There is need to have a good back-up system.

(vii) Devices

- Are there already mobile devices in-country – smart phones and/or tablets?

(viii) Human resource – technical capacity

- Countries will need a pool of software development staff available to be able to support open-source systems. These would ideally be government staff.
- Computer literacy of staff is key for those who will use the electronic system that is developed;
- It might be necessary to train and retrain, as technology evolves (continued education).

(d) Availability of partnerships

(i) Partnership frameworks for public–private partnerships with telecom operators to support eIDSR systems should be explored jointly with ministries responsible for ICTs and telecoms;

(ii) Explore if required partnerships are available for implementing eIDSR.

(e) Determining appropriate scope of eIDSR implementation, including One Health approach

(i) Based on the assessments above, countries should determine the scope of implementing eIDSR (alert notification, case-based reporting, routine weekly reporting, routine monthly reporting, and outbreak/emergency management). Countries may start with any approach that fits their needs and capacity at the time, and later add on other functions. Obtain estimates for initial investments and current costs;

(ii) Countries should determine potential investors.

(f) Rolling out eIDSR plan

(i) Develop and launch country-specific eIDSR implementation plan.

(ii) Develop annual operational plan (timelines, costs, responsibilities) and long-term (5 years) national eSurveillance plan in the framework of existing integrated health plan(s).

(iii) Consider a step-wise incremental process in implementing plan and training.

(iv) Incorporate routine monitoring and regular evaluations, including an initial baseline assessment, prior to implementation.

9.6.2 Important considerations for a successful eIDSR

The following are deemed important considerations for successful implementation of eIDSR in a country.

(a) Laboratory integration

(i) System should link with lab data or have the ability to link to lab data in the future.

(b) Data privacy and use of a unique identifier (ID number)

(ii) Data collection with patient identifiable data must go to a server with protections.

(iii) Access to data should be controlled through user-access rights.

(c) Data security and user-agreement policies

(i) There should be clear guidelines on how to access data.
(ii) There should be scheduled data backups (local and remote).
(iii) Physical data storage devices should be secure and locked.

(d) IT System Maintenance

(i) Software upgrades, hardware upkeep or replacement and server maintenance should be considered, if system is in-house.

(e) Sustainability

(i) In order to ensure sustained support of the eIDSR programme, a sustained financial base will need to be established to account for routine and one-time costs such as hardware system maintenance, training of personnel, connectivity costs and end-user materials, such as those for information, education and communication (IEC).
(ii) There should be local capacity to maintain software and hardware.
(iii) There should be adequate resources to support operational infrastructure.
(iv) There should be enough resources to support capital investments, such as mobile devices and computers, and associated operational costs.
(v) Resources for continued capacity building, training, re-training, etc. should be established.
(vi) eIDSR should be anchored within national eHealth policy and strategy.
(vii) There should be, right from the beginning, stakeholder (including private companies and telecom companies) involvement in the design and implementation stage.
(viii) There should be advocacy for domestic financial resource allocation as well as innovative financial solutions, including leveraging resources from the private sector, such as telecom providers.

(f) Interoperability

(i) Ideally, data may be shared across systems (including with the surveillance system), from the animal and other relevant sectors.

9.6.3 Potential available tools for eIDSR

Several countries in the Region use open-source tools such as DHIS2 for data collection and aggregation. Some countries, such as South Africa and Lesotho, use commercial software such as some electronic medical record (EMR). In considering the use of commercial software, countries should ensure that there is a budget for licensing costs; negotiations should be done also to ensure that suppliers provide enhancements or adaptations. It is important to note that open source does not mean "free" as there are always implementation and customization costs to fit that country's specific context and needs.

9.7 Using eIDSR in core surveillance functions

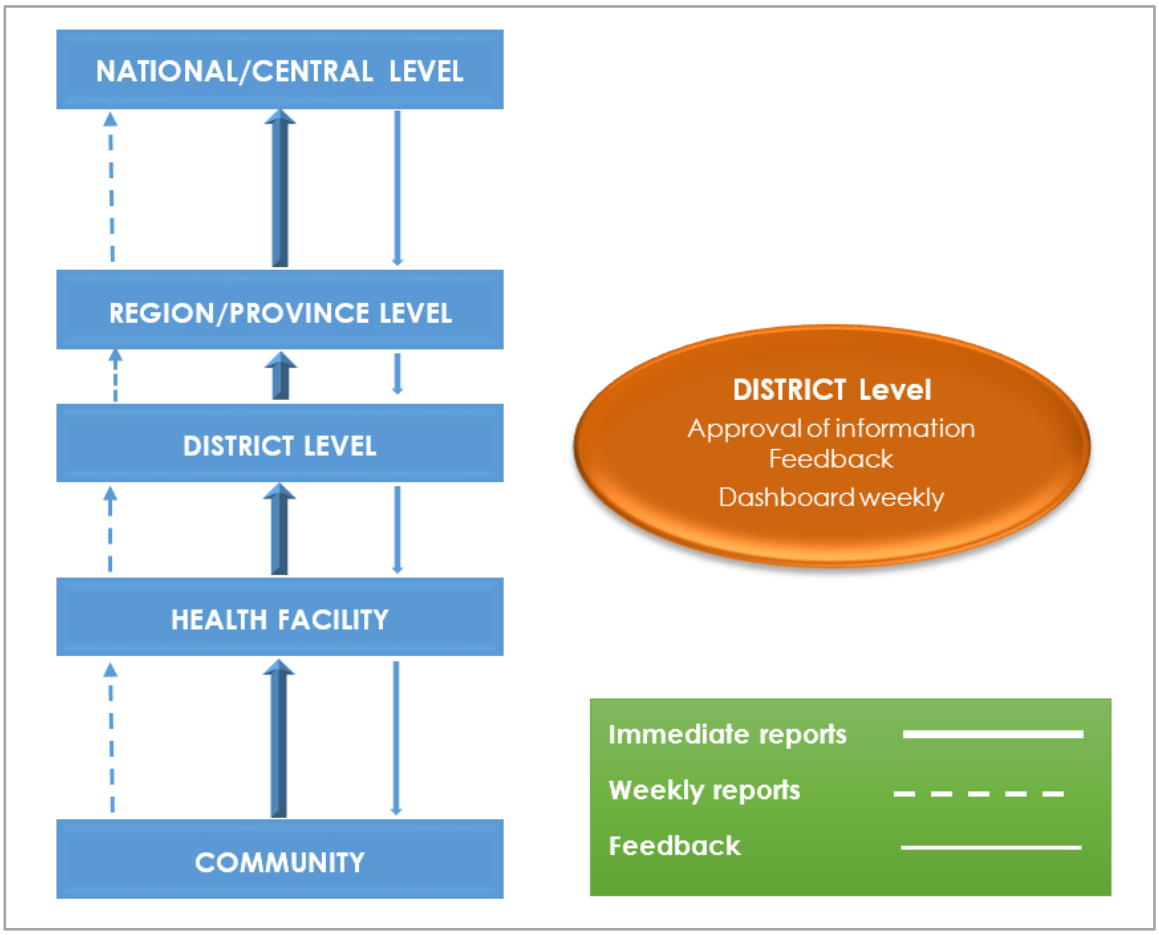
There are many components that will ensure successful implementation of eIDSR in the public health sector. These components include understanding the scope and operational environment, using the right tools, and building capabilities within the local context. The One Health approach also provides an opportunity for creating interoperable, interconnected electronic reporting systems between human and animal surveillance systems.

The use of e-tools for conduct of Data Quality Assessment/Assurance (DQA) is also part of a monitoring and evaluation strategy of IDSR functions, which may be used for continuing improvement of data quality. Such tools can identify errors, inconsistencies and other data anomalies which can affect reliable, accurate, precise and complete data.

Within a given country context, establishing an electronic platform can facilitate implementation of the following IDSR activities, as described in previous sections of the document:

(a) real-time reporting (indicator and event-based surveillance); refer to Introduction Section;
(b) alert notification (community and health facility reporting); refer to Section 2;
(c) case-based reporting; refer to Section 2
(d) routine reporting (weekly aggregates) and routine monthly reporting; refer to Section 2. Figure 9.1 below illustrates how information flows in eIDSR system;
(e) outbreak/emergency management; refer to Sections 4 and 6; case investigation; refer to Section 6;
(f) contact tracing; refer to Section 6;
(g) logistics and supply chain management; refer to section 6;
(h) real-time outbreak line-listing; refer to Sections 4 and 6;
(i) event management (hazard description, characterization, risk assessment and outcomes); refer to Section 6;
(j) information products i.e. situation reports (Sitreps), epidemiological bulletin etc. refer to Section 7; supportive supervision; refer to Section 8;
(k) monitoring and Evaluation and Data Quality Assessment (DQA); refer to Section 8.

Figure 9.1: Information flow for eIDSR



9.8 Roles and responsibilities at different levels in the context of real-time reporting and outbreak/emergency management

The following are some roles and responsibilities with regard to eIDSR at various levels. These roles should be complemented by specific roles, as described in relevant sections. Countries may modify or add to the roles, depending on their context.

(a) Community level

(i) Contributing information on events e.g. through toll-free helplines;
(ii) Acting on alert message sent from health authorities;

(b) Health facility level

(i) Depending on the eIDSR platform, reporting events requiring immediate action;
(ii) Submitting weekly IDSR reports;
(iii) Following up on events that are reported by community;
(iv) Acting on notifications and respond, as recommended, for their area of jurisdiction;
(v) Ensuring compatibility of their handset with eIDSR;
(vi) Ensuring maintenance and ownership of handset and other tools.

(c) District level

(i) Providing staff access to the eIDSR;
(ii) Verifying and approving onward transmission of reported events from lower health facilities;
(iii) Issuing alerts to other facilities and leaders, regarding events within the district;
(iv) Providing feedback to reporting health facilities regarding events;
(v) Updating health facilities and leaders on progress made regarding response;
(vi) Training, mentorship and supervision of health staff;
(vii) Mobilizing resources to support effective implementation of eIDSR;
(viii) Ensuring availability and compatibility of ICT equipment with eIDSR;

(d) Provincial/regional level

(i) Training and supervision;
(ii) Collaborating with national level to develop and update electronic tools;
(iii) Issuing alerts to districts;

(e) Central/ national level

(i) Maintaining the server;
(ii) Developing and updating electronic tools;
(iii) Managing the eIDSR system, including troubleshooting;
(iv) Maintaining system administration (registration of health staff using server)
(v) Training and supervision;
(vi) Providing feedback;
(vii) Issuing alerts to other facilities;
(viii) Coordination of partners and stakeholders;
(ix) Ensuring linkage with other platforms, to facilitate interoperability;
(x) Monitoring alerts;
(xi) Doing advocacy with policy-makers, and resource mobilization to sustain the system;
(xii) Ensuring data security;
(xiii) Overseeing development and implementation of national ehealth/digital health strategy;
(xiv) Aligning eIDSR investments, and working with national ehealth/digital health strategy;
(xv) Country ehealth/digital health architecture with consideration for re-usable components;
(xvi) System governance.

(f) WHO and other regional bodies (AU, ECOWAS, Mano River Union, EAC, ECSA, SADC etc)

(i) Facilitating creation of formal platform for sharing information and data across countries;
(ii) Technical assistance to Member States;
(iii) Sharing best practices and facilitating exchange of expertise;

9.9 Supervision, Monitoring and Evaluation

eIDSR development and implementation requires constant monitoring. This is very important during the initial system development and implementation phase. System functionality can be evaluated by looking at issues such as:

(a) acceptability or willingness to participate. i.e. number of people who are accessing and using the system correctly;
(b) accessibility – Is the system accessible from the place where the reporting site is situated? In some areas, where mobile telephone is used for eIDSR, accessibility is an important aspect, and this can hamper prompt reporting of diseases;
(c) data quality and completeness – Check for any data errors;
(d) timeliness of data submission;
(e) system flexibility, portability and stability; and
(f) cost.

To improve data use at the service level, users should be encouraged to use the system with regular feedback of information to lower levels; information flow should not be one-way.

Other system performance indicators include core surveillance indicators for monitoring IDSR (refer to section 8). The IDSR support supervision checklist should be used during supervisory visits, while considering integrated needs from other teams, in terms of joint supervision. The supportive supervision checklist has to be updated to incorporate eIDSR, and uploaded as part of the eIDSR platform. Overall evaluation of the eIDSR system, and its interoperability with the HMIS and eHealth system, should be done periodically, using a blend of internal and external experts.

9.10 References

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