

TECHNICAL GUIDELINES FOR

INTEGRATED DISEASE SURVEILLANCE RESPONSE IN THE WHO AFRICAN REGION

THIRD EDITION

BOOKLET FIVE: SECTION 10



**World Health
Organization**

REGIONAL OFFICE FOR

Africa

This booklet comprises the following section of the Integrated Disease Surveillance and Response Technical Guidelines:
Section 10: Tailoring Integrated Disease Surveillance and Response (IDSR) to Emergency or Fragile Health System contexts

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

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MARCH 2019

Integrated Disease Surveillance and Response Technical Guidelines: Booklet Five: Section 10

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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

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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.

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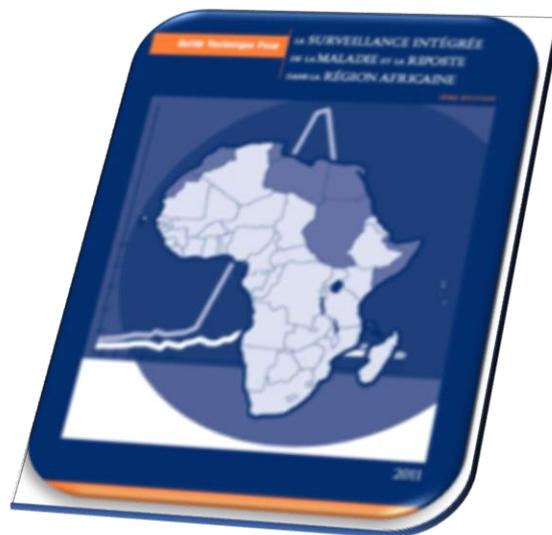
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INTEGRATED DISEASE SURVEILLANCE AND RESPONSE TECHNICAL GUIDELINES

THIRD EDITION



BOOKLET FIVE: TAILORING IDSR TO EMERGENCY OR FRAGILE HEALTH SYSTEM CONTEXTS

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SECTION 10: TAILORING IDSR TO EMERGENCY OR FRAGILE HEALTH SYSTEM CONTEXTS

10. INTRODUCTION

Humanitarian emergencies have major implications for the populations where they occur and for their health services surveillance systems (WHO, 2012). Emergencies typically result in population displacement to congested settings where access to basic needs like water, food, shelter and other social services are constrained. These conditions increase the risk of death from common epidemic and endemic diseases.

Consequently, effective public health surveillance and outbreak response is a priority during public health emergencies in affected populations. Due to the disruption of health and other social services during the emergencies, the routine IDSR system must be enhanced to meet the public health surveillance and outbreak response needs in humanitarian contexts. In these settings, IDSR should be tailored to the prevailing context to meet the additional emergency needs.

Similarly, an Enhanced IDSR system should be established in such settings to address the humanitarian emergency. It should be based on the IDSR strategy, structures, tools, guidelines and resources, but should ensure the flexibility required in addressing the surveillance and response needs of affected populations in emergency situations. This should be done within the existing national IDSR system.

This section introduces key principles of implementing IDSR in complex humanitarian emergencies. This will involve enhancing IDSR core functions to ensure early detection, assessment and response to acute public health events. For a more detailed description, please refer to the WHO document on early detection, assessment and response to acute public health events - implementation of early warning and response with focus on event-based surveillance, (WHO, 2014).

10.1 Health information system in emergency contexts

Acute and protracted crises have major immediate and long-term effects on population health and health systems. Conflicts and disasters create disruptions in the overall functionality of the health system. In such situations, the routine IDSR system may be underperforming or may be disrupted. The IDSR must therefore be tailored to adequately meet the surveillance information needs of a humanitarian emergency. Examples of such humanitarian emergencies include: armed conflict, famine, natural disasters and other major emergencies.

10.1.1 Key definitions in Emergency contexts

10.1.1.1 Disaster

A serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community or society to cope using its own resources (International Strategy for Disaster Reduction [ISDR], 2009). A disaster is also defined as a situation or event which overwhelms local capacity, necessitating additional national or international assistance (Center for Research on Environmental Decisions [CRED, ReliefWeb, 2008).

10.1.1.2 Humanitarian emergency

A situation where the basic human needs of a population are threatened and therefore requires extraordinary measures and urgent action (ReliefWeb, 2008).

10.1.1.3 Complex emergency

A humanitarian crisis in a country, region or society where there is total or considerable breakdown of authority resulting from internal or external conflict and which requires an international response that goes beyond the mandate or capacity of any single and/or ongoing UN country programme (ReliefWeb, 2008).

10.2 Early Warning and Response

Early warning is an organized mechanism to detect, as early as possible, any abnormal occurrence or any divergence from the usual or normally observed frequency of diseases, conditions and events. It relies on a network of people from functional static or mobile health facilities/clinics whose responsibility it is to collect, investigate, report, analyze and disseminate information from the field to the central level for appropriate action.

10.2.1 Why is it needed?

The enhanced surveillance needs during humanitarian emergencies demand that surveillance systems are in place for systematic collection, collation, analysis, and interpretation of data, and for dissemination of information to facilitate public health response to prevent excess morbidity, mortality and disability (WHO, 2009). Consequently, during the acute phase of a humanitarian emergency, IDSR should be modified as soon as possible to focus on priority health problems during the emergency phase. The tailored IDSR should focus on diseases, conditions or events for a given emergency context and should be flexible enough to respond to other emerging public health priorities (WHO, 2009).

During emergencies, populations are more vulnerable to morbidity, mortality and disability resulting from endemic and epidemic-prone diseases. Thus, IDSR should be enhanced within 3–10 days of grading the public health emergency to facilitate rapid detection and response to disease outbreaks and public health events (WHO, 2009). Ultimately, this will contribute to the overall goal of reducing avoidable mortality, morbidity, and disability during humanitarian crises (WHO, 2009b).

10.2.2 What are the objectives of tailoring IDSR to emergency context?

The main objective is to rapidly detect and control acute public health events of any origin, with particular attention to prioritized health risks. The aim is to increase sensitivity of detection, quality of risk assessment, and timeliness and effectiveness of the response to acute public health risks in order to minimize the negative health consequences to the affected population.

The specific objectives are to:

- (a) Detect acute public health events and health risks early.
- (b) Ensure immediate communication of information from local and intermediate levels to national levels as well as from any source identified at the national level.
- (c) Verify the initial information (i.e. the signal).
- (d) Document the nature of the event through investigation, characterization, etiological confirmation.
- (e) Perform risk assessment to determine the level of risk posed by the detected event.
- (f) Ensure immediate alert mechanisms from national and/or intermediate levels to local levels.
- (g) Ensure prompt investigation as necessary and implement an adequate response through mitigation and control measures, as required by the continuous risk assessment.
- (h) Alert and maintain communication/coordination with national/international stakeholders.

10.2.3 Critical components

During humanitarian crises, all functional static and mobile health facilities/clinics, including those in refugee camps for internally displaced persons (IDPs) which provide curative, disease prevention and health promotion interventions should be included in the IDSR network to enhance the sensitivity of the system (WHO, 2009). Depending on the extent of the crisis, the surveillance network may include government and/or partner-supported clinics (WHO, 2012).

To ensure efficiency, the data collection and analysis processes need to be systematized and formalized. Epidemic intelligence should be based on the two main IDSR event detection systems, namely: indicator-based surveillance (immediate and weekly reporting of data aggregated by health facilities) and event-based surveillance, which is the organized collection, monitoring, assessment and interpretation of mainly unstructured *ad hoc* information regarding health events or risks. These complementary systems increase the sensitivity of IDSR to ensure timely detection and verification of outbreaks, and effective monitoring of morbidity patterns (WHO, 2012)

10.3 Implementation of IDSR in humanitarian emergencies

10.3.1 Rapid assessment of the situation

During the acute phase of the emergency it is helpful to undertake a systematic assessment of the risk of acute public health events. This involves gauging both the likelihood of a disease occurring and its eventual impact. The assessment can identify the epidemic-prone diseases that have the potential to cause the greatest amount of morbidity and mortality in the affected population, and determine the geographical scope of surveillance. An assessment of the status of key surveillance infrastructure is also done, including existing surveillance capacity, identification of resource needs for IDSR implementation, including staff with relevant skills, communication and IT equipment laboratory support and transport. The assessment should be based on consensus-building, analysis of existing data, establishment of working groups and conducting of in-depth interviews, as required. It should be based on an all-hazards approach and be repeated as the emergency evolves, to account for changes.

10.3.2 Gap analysis

The gap analysis should be performed to complement the situation analysis and the assessment of the surveillance system. It aims to assess the specific needs and environment and review the strengths, weaknesses, threats and opportunities around the existing national surveillance system in order to identify available resources to reinforce IDSR. Gap analysis does not require a new or additional formal evaluation to be carried out. The results of previous evaluations of the surveillance system can be reused. In cases where not all of the information needed is available, focus groups or in-depth interviews with stakeholders at all levels of the surveillance system could be considered.

10.3.3 Prioritization

In order to ensure the most efficient use of resources, the strategy should be based on a prioritization exercise, the results of the gap analysis and the list of priority events for surveillance. For each selected disease, condition or event, surveillance objectives need to be specified based on the country's context. The objectives will depend on the characteristics of the disease, condition or event (e.g. attack rate, morbidity and mortality, setting), the mode of transmission (e.g. person to person, point source outbreaks, exposure to toxic substances), and the nature of the public health interventions required to control spread.

10.3.4 Development of a plan of action for the implementation of IDSR

Once the prioritization exercise has been completed and all potential sources of information listed, a plan of action should be developed and implemented at the national, intermediate and local levels. The plan of action should be well-integrated with the national IDSR system, including monitoring and evaluation.

10.3.5 Designate a coordination mechanism

A coordination structure should be established at the national and intermediate levels to ensure a single-entry point for reporting, analysis and triaging of information, verifying signals, assessing risks, and monitoring and responding to acute public health events.

10.4 Various actors in enhancing IDSR to improve early warning and response

During acute or complex emergencies where the capacity of the national and sub-national IDSR system in the MoH is greatly constrained, the roles and responsibilities of various actors may need to be reinforced.

10.4.1 Central/National level

The overall coordination of data collection, entry, analysis and dissemination during humanitarian crises should be undertaken by the IDSR unit within the Ministry of Health (MoH) with support from WHO and partners, and fed as necessary to the Public Health Emergency Operations Centre (PHEOC) if one already exists. If the PHEOC exists, the National Public Health Emergency Management Committee (PHEMC) coordinated by the national PHEOC is activated, to support the coordination and response activities in the affected regions and districts. However, during acute crises or complex emergencies where the capacity of the national surveillance coordination unit in the MoH is greatly constrained, a coordinator (typically an epidemiologist or public health expert with experience in disease surveillance and disease control in emergencies) can be recruited to support the Ministry of Health during the acute phase of the crisis (WHO, 2012). The functions of the coordinator will be guided by the initial rapid assessment and should include but not be limited to:

- (a) Providing dedicated technical oversight.
- (b) Coordinating the supervision of surveillance and outbreak response activities in crisis-affected areas.
- (c) Guiding coordination of health workers and partners for effective disease surveillance and outbreak/public health response in crisis-affected populations.
- (d) Supporting districts/provinces or regions to investigate and respond to outbreaks or public health events including reorientation of staff in IDSR.
- (e) Conducting regular analysis of epidemiological trends and production of regular surveillance bulletins and situation reports.
- (f) Providing aids for reporting and notifying priority diseases, conditions and events.
- (g) Supporting evaluation.

10.4.2 District, provincial or regional level

The existing IDSR focal points at district, provincial or regional level should coordinate surveillance and response activities in crisis-affected populations. However, during acute crises or complex emergencies where the capacities of district/provincial, regional or national/central surveillance focal points are constrained, WHO country office, working in close collaboration with the health cluster, should assign a partner or a focal point in each affected district to:

- (a) Coordinate disease surveillance and outbreak response in crisis-affected populations.
- (b) Ensure timely reporting of priority diseases, conditions and events related to the crisis.
- (c) Conduct trend analyses and provide feedback to health facilities and clinics.
- (d) Conduct initial investigation of disease outbreaks and public health events.
- (e) Respond to disease outbreaks and public health emergencies in collaboration with national MoH, partners, and local health facilities.

10.4.3 Public and partner-supported health facilities or clinics

All identified focal persons working in health facilities or mobile clinics offering curative, preventive and health promotion services should implement the following:

- (a) Detect, collect and report priority diseases, conditions and events.
- (b) Support the verification and investigation of outbreaks and public health events.
- (c) Undertake public health and outbreak response measures, with support from the community focal persons, district and national surveillance focal points.

10.5 Key structures and tools to be put in place during an acute humanitarian crisis

10.5.1 List of diseases/conditions/events

During the acute phase of a humanitarian crisis, a rapid risk assessment should be undertaken to identify diseases, conditions, and events that pose a threat to the population. These should be prioritized in addition to the national IDSR priority list. In identifying the list of additional priority diseases, conditions and events, criteria for inclusion should take into account WHO guidelines for inclusion of an event under a surveillance system (WHO, 2012), namely:

- (a) Epidemic.
- (b) Vaccine preventable diseases due to disruption of immunization in most of the emergencies.
- (c) Ability to cause severe morbidity or death.
- (d) International surveillance requirements (IHR, 2005).
- (e) Availability of prevention and control measures.
- (f) Availability of reliable and meaningful case definitions and simple laboratory tests, where appropriate.

It is critical that clinicians register the most important diagnosis per patient and that only new case visits are counted and not the follow-up visits.

The sources of data on new cases include:

- (a) Outpatient clinics
- (b) Inpatient clinics
- (c) Laboratory
- (d) Mobile clinics in the community or from focal people identified from community
- (e) IDP/refugee camp clinics
- (f) Other sources of event-based information

10.5.2 Case definitions

For the diseases, conditions and events already included on the IDSR priority disease list, the existing case definitions should be used. Sensitive case definitions that increase the chances of detecting new outbreaks should be developed for the additional diseases, conditions, events and syndromes identified as part of the risk assessment. These case definitions should be simple, standardized and harmonized with the national IDSR case definitions.

10.5.3 Laboratory support

Quality assured WHO approved Point of care Rapid Diagnostic Test (RDT) kits for diseases like malaria, cholera, meningitis, and hepatitis A and E are essential for timely treatment and outbreak response decisions.

Laboratory confirmation is more critical for suspected outbreaks in crisis-affected populations and the following should be in place to facilitate timely investigation of new outbreaks:

- (a) Adequate stocks of outbreak and sample collection kits/SOPs (standard operating procedures) at the local level.
- (b) Cold chain and shipping arrangements that are linked to the national specimen transportation network.
- (c) Field or mobile laboratories that are set up to address the routine and outbreak laboratory testing needs of crisis-affected populations.
- (d) Existing laboratories at national and sub-national levels that have been strengthened to address the extra demands of crisis-affected populations.
- (e) Referral laboratories (national and international) should be identified to facilitate laboratory confirmation, antibiotic susceptibility testing and quality control.
- (f) The existing IDSR laboratory and case investigation forms should be used for routine collection and reporting of laboratory aggregate and case-based data.
- (g) Harmonization of laboratory reporting between surveillance and laboratory systems for timely dissemination of results.

10.5.4 Methods of data collection

Data should be collected on reportable alerts and priority diseases, conditions and events that are generated from data sources, such as inpatient and outpatient clinics, mobile clinics, laboratories; disease-specific active case search or outbreak investigations; community health workers; community alerts and other sources of disease surveillance data. Health workers should observe the following standards:

- (a) Strict adherence to the case definitions while collecting disease, conditions or event data.
- (b) Each patient should be assigned one main diagnosis and counted once.
- (c) New and follow-up visits should be coded separately in the health facility register.

The data collection will entail the following paper-based tools and/or electronic platforms:

- (a) National Health Management Information System (HMIS) outpatient and inpatient registers.
- (b) IDSR immediate case-based and laboratory investigation form.
- (c) IDSR weekly/monthly summary reporting form.
- (d) IDSR health facility alert logbook.
- (e) Disease specific line lists.
- (f) Generic or disease-specific case investigation forms.
- (g) Mortality line lists.

10.5.5 Data reporting and transmission methods

Humanitarian crises tend to disrupt existing national disease surveillance platforms for transmitting data. In the same way, crisis-affected populations may have additional public health needs beyond the ones established through the routine IDSR. Flexibility should be exercised to update the existing IDSR/HMIS reporting tools to capture diseases, conditions and events unique to crisis-affected populations. Consequently, the existing IDSR/HMIS paper-based tools and/or electronic reporting platforms should be updated to capture such additional diseases, condition, and public health events.

The reporting platforms (paper based and/or electronic) should provide for the following reporting timelines:

- (a) Immediate reporting of epidemic-prone disease alerts.
- (b) Daily reporting of aggregated and/or case-based data on priority diseases, conditions, events during the acute phase of the crisis and after a new outbreak is confirmed.
- (c) Weekly reporting of aggregated data on priority diseases.
- (d) Weekly mortality line listing should be updated with community and health facility deaths and reported.

10.5.6 Data analysis and interpretation

The principles of data analysis utilized as part of the routine IDSR should be used in crisis-affected populations. Analysis on aggregated data is therefore conducted to document and describe disease trends and crossing of thresholds. The data is also used to calculate ratios and rates.

Before embarking on any analysis, data validation and cleaning should be undertaken for missing entries, outliers, and duplicates. The basic analysis entails case/death descriptive analysis by time, person, and place.

Morbidity indicators in crisis-affected populations include:

- (a) Absolute counts of cases and deaths by priority disease.
- (b) Incidence of disease (new cases by week divided by the total population) with a graph to show trends from recent weeks. This can be disaggregated by location and person characteristics.
- (c) Proportional morbidity (new cases of disease in a week divided by the new consultations in the week).
- (d) Case fatality ratio (CFR) – the proportion of cases that die from a specific disease.
- (e) Attack rate during outbreaks as the cumulative incidence of epidemic disease in a population over a period of time.

The mortality indicators in crisis-affected populations

It is critical that mortality rates (CMR and U5MR) are monitored for crisis-affected populations to ensure that rates exceeding the established emergency threshold are detected and responded to promptly.

- (a) Crude Mortality Rate (CMR) as deaths per 10 000 per day is calculated as the number of deaths divided by the population present during the period and the total number of days over which the deaths were reported.
- (b) Under-five Mortality Rate (U5MR) as deaths per 10 000 per day is calculated as the number of deaths in under-fives divided by the population of under-fives present during the period and the total number of days over which the deaths were reported.

The existing electronic platforms offer the advantage of automated analyses for both routine and case-based outbreak data thus saving time and ensuring analysed data is available in real-time to inform disease surveillance and outbreak response decisions at all levels.

10.5.7 Feedback and dissemination

Feedback is critical for ensuring full engagement of the stakeholders. In addition to informing disease control efforts, information providers must be included in feedback. Weekly surveillance summaries, bulletins and presentations should be presented and reviewed during:

- (a) Weekly IDSR or outbreak committee meetings.
- (b) Health and Water, Sanitation and Hygiene (WASH) (and other relevant) cluster meetings.
- (c) Other relevant disease control meetings.
- (d) Extension of all reporting units and stakeholders to inform public health response decisions
- (e) Outbreaks, regular situation reports should be shared with all stakeholders.

The existing electronic platforms offer the advantage of producing automated disease surveillance and epidemic bulletins or situation reports to inform disease surveillance and outbreak response decisions at all levels.

10.5.8 Support functions for surveillance in crisis-affected populations

To optimize the functioning of disease surveillance and outbreak response in crisis-affected populations, it is critical that IDSR guidelines are adapted and used to improve access to the following:

- (a) Surveillance and outbreak response guidelines at all levels.
- (b) Training of health workers, surveillance focal persons or points and rapid response teams on surveillance functions including outbreak preparedness, investigation and response.
- (c) Support to communication (computers, phones, internet connectivity) based on local context and surveillance needs.
- (d) Regular supervision and support to enhance surveillance functions at all levels.
- (e) Periodic evaluation to improve the performance of the surveillance system (refer to framework for evaluating surveillance systems).

10.5.9 Outbreak preparedness

Outbreak preparedness is paramount given the heightened risk of disease outbreaks in crisis-affected populations. Preparedness efforts should, as much as possible, be integrated in the existing national IDSR framework at national and sub-national levels with the Ministry of Health leading the efforts and supported by WHO and partners. However, during acute or complex emergencies where the capacities of the Ministry of Health are greatly compromised or diminished, WHO, working with the health cluster partners should take lead to enhance outbreak preparedness (WHO, 2012). The key preparedness efforts in crisis-affected populations should entail the following:

- (a) Strengthening existing or forming new multisectoral outbreak control teams at national and sub national levels, with roles and responsibilities designated for each team member.

- (b) Updating existing or developing new outbreak prevention and response plans that incorporate risks unique to crisis-affected populations.
- (c) Development or updating (if necessary) of standard line-list forms for data collection during an outbreak.
- (d) Development and distribution of standard treatment protocols for key diseases, with strategies for training of staff.
- (e) Calculation of potential attack rates for epidemic-prone diseases, where possible.
- (f) Pre-positioning stocks of essential treatment supplies to initiate outbreak control (e.g. oral rehydration salts, intravenous fluids, vaccination material, personal protective equipment, transport media for samples, water purification supplies, disinfectants, spray pumps and information leaflets on preventive measures for health staff or the community)
- (g) Procurement of laboratory sample collection for the priority diseases, and identification of a competent laboratory for confirmation of cases.
- (h) Identifying potential sites for isolation and adequate treatment of patients, or for extra capacity, in the event of a surge in cases (e.g. a cholera treatment centre)
- (i) Implementing relevant prevention measures based on the risk assessment of diseases (e.g. measles and cholera vaccination, indoor-residual spraying of dwellings and distribution of long-lasting insecticide-treated nets to prevent outbreaks of measles, cholera, and malaria).
- (j) Scaling up preparedness and response efforts/ activating rapid response teams at the points of entry (PoE).

10.5.9.1 Alert and epidemic thresholds

The following thresholds are used in crisis-affected populations:

- (a) Assess the severity of the humanitarian crisis based on the crude mortality rate (CMR) and under five mortality rate (U5MR).
 - (i) The crude mortality rate threshold should be less than 1 death per 10 000 people per day.
 - (ii) The under-five mortality rate threshold should be less than 2 deaths per 10 000 people per day.
- (b) Alert system for detecting possible outbreaks based on doubling of weekly incidence compared to the weekly average of previous 2-3 weeks.
- (c) Detection of a case of potentially severe epidemic-prone disease like measles, polio, cholera, viral haemorrhagic fevers (VHF) or meningitis based on the IDSR alert and action thresholds specific to crisis-affected populations.

Once the thresholds are exceeded, verifications, investigations and response should be instituted promptly to prevent further morbidity and mortality.

10.5.9.2 Alert verification

To minimize morbidity and mortality, alert verification should start immediately once the alert is received by sub-national and national surveillance focal points (WHO, 2012). The verification can be done by telephone or site visit and can include the collection of information about:

- (a) Cases based on standard case definitions (SCDs).
- (b) Symptoms and signs (consider differential diagnoses).
- (c) Date of onset of symptoms of the first and the most recently detected cases.
- (d) Place and date seen or admitted at the health facility.
- (e) Age, sex and vaccination status of patients, where relevant.
- (f) Place of residence at onset of illness.
- (g) Where cases are occurring (community-level data)
- (h) Geographical, personal and time relationships between cases.
- (i) Prompt laboratory investigation of samples from suspected cases.
- (j) Outcomes including, for example, deaths, case management details and the health-care staff affected.

10.5.10 Outbreak investigation

Outbreak investigation involves determining the cause of an outbreak and who is at risk so that control measures can be implemented. The main objective of an outbreak investigation is to control the outbreak and thus reduce morbidity and mortality. The investigation should begin as soon as an alert is detected and has been verified.

The investigations should be undertaken by rapid response teams at national and sub-national levels that have been established as part of the national IDSR framework. In acute and complex emergencies, dedicated and trained teams will be identified to undertake the investigations, which should follow existing IDSR outbreak investigation guidelines that have been adapted to address the unique needs of crisis-affected populations.

10.5.11 Outbreak response

Outbreak response should follow the existing national IDSR framework at national and sub-national levels with the country's existing structures leading the efforts. However, during acute or complex emergencies where the capacities of the Ministry of Health are greatly compromised or diminished, WHO, working with the health cluster partners should take lead in coordinating and implementing outbreak response activities.

The additional risks in crisis-affected populations will demand strengthening existing or formation of new multisectoral outbreak control teams at national and sub national levels, with roles and responsibilities designated for each team member as set out in the IDSR outbreak response guidelines. Health, Water, Sanitation and Hygiene (WASH) and other relevant cluster partners should support outbreak response activities in crisis-affected populations.

10.6 Exit strategy

During the recovery phase of the crisis, the Ministry of Health should work with WHO and partners to re-establish all the IDSR structures and focal points in the crisis-affected populations. Countries should aim at conducting an evaluation to assess what happened, why it happened and document lessons learnt and gaps identified to inform the recommendations to prevent future occurrence.

10.7 References

1. ReliefWeb. (2008). Glossary of Humanitarian terms. Retrieved from <http://www.who.int/hac/about/reliefweb-aug2008.pdf?ua=1>
2. WHO. (2009a). Surveillance/EWARN in Emergencies. Retrieved from http://www.who.int/diseasecontrol_emergencies/publications/idhe_2009_london_surveillance_morbidity.pdf
3. WHO. (2009b). WHO | Health Cluster Guide. Retrieved April 13, 2018, from <http://www.who.int/health-cluster/resources/publications/hc-guide/en/>
4. WHO. (2012). WHO | Outbreak surveillance and response in humanitarian emergencies. Retrieved April 13, 2018, from http://www.who.int/diseasecontrol_emergencies/publications/who_hse_epr_dce_2012.1/en/
5. http://apps.who.int/iris/bitstream/handle/10665/112667/WHO_HSE_GCR_LYO_2014.4_eng.pdf?sequence=1), released in 2014