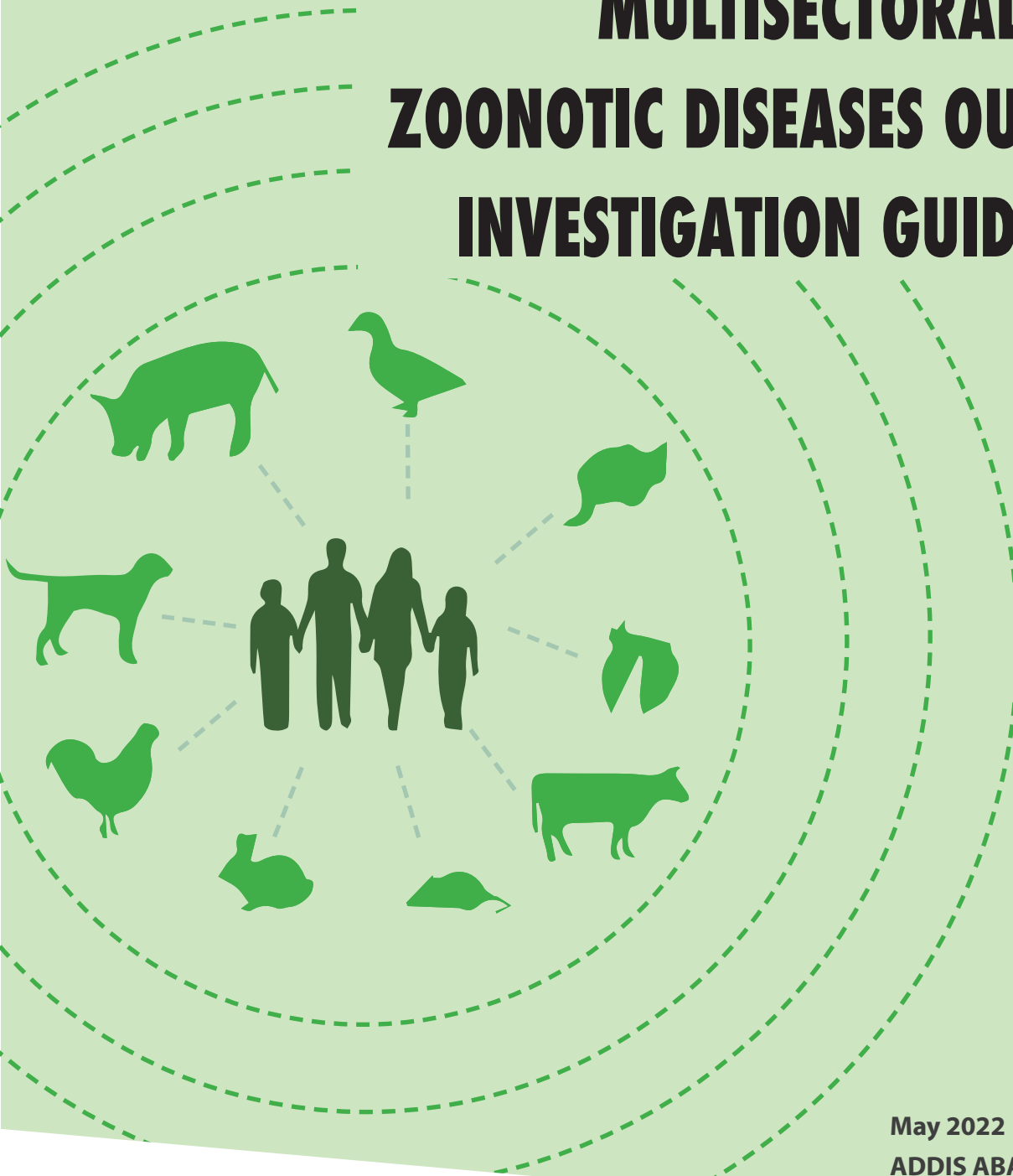




FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

MULTISECTORAL ZOO NOTIC DISEASES OUTBREAK INVESTIGATION GUIDELINE



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ADDIS ABABA, ETHIOPIA



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ACRONYMS

AHA	Animal Health Assistants
HEWs	Health Extension Workers
AHI	Animal Health Institute
EPA	Environment Protection Authority
EPHI	Ethiopian Public Health Institute
EPT	Emerging Pandemic Threats
EWCA	Ethiopian Wildlife Conservation Authority
HPAI	Highly Pathogenic Avian Influenza
MOA	Ministry of Agriculture
MOH	Ministry of Health
NMZDOBI	National Multisectoral Zoonotic Diseases Outbreak Investigation
NOHSC	National One Health Steering Committee
NVI	National Veterinary Institute
OH	One Health
OIE	World Organization for Animal Health
PPE	Personal Protective Equipment
RAB	Regional Agriculture Bureau
RHB	Regional Health Bureau
ROHP	Regional One Health Platform
RR	Rapid Response
RRT	Rapid Response Team
RVF	Rift Valley Fever
TWG	Technical Working Group
ULD	Unknown Liver Disease
WHO	World Health Organization
ZD	Zoonotic Diseases
ZDOBI	Zoonotic Diseases Outbreak Investigation

FORWARD

The bond between people and domestic animals and the value placed on animals in Ethiopia since the ancient times is well established, where more than 75% of households own animals. There are approximately 300 zoonoses recognized worldwide, 150 of which are considered to be of public health significance which can seriously impact both human and animal populations. Zoonoses are defined by the World Health Organization (WHO) as “diseases and infections which are naturally transmitted between vertebrate animals and man. As a matter of fact, the prevention, investigation and control of zoonoses necessitates a multi-sectoral, multidisciplinary one health approach.

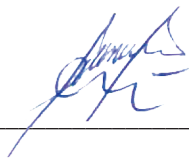
As a part of addressing the health threats with in the interface of animal-human-environment, Ethiopia established the national one health steering committee and various technical working groups with the engagement of relevant sectors including human health, animal health (agriculture) and environmental health (ecological & wildlife) in 2016. The major objectives of the platform are to ensure a more sustainable coordination mechanism, and to undertake one health programs and activities including the zoonotic disease outbreak investigation. Though there were continuous efforts to organize and deploy multidisciplinary outbreak investigation teams on various occasions it has suffered coordination problem and as a consequence has never meet its intended objectives.

Hence, this multi-sectoral zoonotic diseases outbreak investigation (ZDOBI) guideline is developed to provide guidance on coordination and zoonotic diseases outbreak investigation steps, aiming to effectively and efficiently detect, prevent and control the spread of disease outbreak.

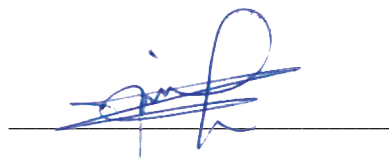
This “zoonotic diseases outbreak investigation guideline” is the first version jointly developed by the Ethiopian Public Health Institute (EPHI), Ministry of Agriculture (MOA) and Ethiopian Environment Authority and Ethiopian Wildlife Conservation Authority Commission (EWCA), with support of development partners, meant to provide comprehensive guide for zoonotic disease outbreak investigation and initiation of quick response actions.

On top of the general coordination set up and major steps of the investigation process, the key inclusion in this guideline is the operational outbreak information flow chart, organization and composition of multidisciplinary zoonotic disease outbreak investigation and rapid response team (ZDOBI & RRT) at national level with clear role and responsibilities of different actors. The guideline also describes step-by-step guide for joint outbreak investigation which shall be considered as standard steps to be followed for any zoonotic disease outbreak investigation in the country.

We hope that the guideline will be useful in alleviating the existing gaps and ensure proper investigation of zoonotic disease outbreaks and significantly contribute to the provision of early and timely preventive and control measures. Finally, we would like to extend our appreciation to the National one health steering committee, partners and others who have contributed and brought this strategic document into a reality.



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BACKGROUND

Today, the convergence and interactions of people, animals and environment has created new dynamics in which the health of each group is inextricably interconnected and totally dependent. The challenges associated with this dynamics are demanding, profound, and unprecedented. At the same time, new opportunities have emerged to protect and promote health in the rapidly changing human, animal and environment domains. However, these opportunities and our abilities to improve health will not be based on strategies and mind-sets of the past, rather, on a new integrated approach that reflects both our profound interdependence and realization that we are part of a larger ecological system, exquisitely and elaborately connected. The key strategy to better understand and address the contemporary health issues created by the convergence of human, animal, and environmental domains is adopting the mind-set and requisite actions that underpin the concept of One Health (OH).

Ethiopia has a history of multi-sectoral collaboration in the management of infectious disease threats and there are several registered ad-hoc initiatives spearheaded following the different health threat occurrences at local and global level in the last 2 decades. While these initiatives engaged different sectors enhancing multi-sectoral collaborations, they were limited in their lifespan and specific in their target, and were disbanded once reduction of the anticipated threat was alleviated. Some of the best examples to be cited include an ad hoc one health initiatives established in response to suspected occurrence of cases of Highly Pathogenic Avian Influenza, Rift Valley Fever, and investigation of unknown liver diseases in Tigray region, There were also other ad-hoc committees , even if which were not functional after the hot times passed and related panics stopped.

Cognizant of the critical need for multisectoral collaboration for the effective prevention, detection and response to infectious diseases and other health threats, the government of Ethiopia established a national multisectoral platform (National One Health Steering Committee- NOHSC) in 2016. Memorandum of Understanding was signed among key sectors (Ministry of Health, Ministry of Agriculture/former Ministry of Livestock and Fisheries; Environment, Forest and Climate Change Commission and Ethiopian Wildlife Conservation Authority). Since its establishment, the NOHSC has been striving to coordinate the key sectors and other relevant stakeholders and is registering remarkable progresses in the adoption and practicing of One Health Approach in Ethiopia.

The NOHSC and TWGs have also been striving to coordinate joint disease surveillance activities and outbreak investigation missions following rumors received from various locations in the territory of the country. Few examples: A multi-sectoral and multi-disciplinary team was organized and deployed by the EPT-TWG for joint survey and potential outbreak investigation conducted in Borena zone of Oromia region following RVF outbreak report in northern Kenya and mass wild birds (Doves) mortality in South Ommo zone of SNNP region; Anthrax outbreak investigations in Wag Himra and North Gondar zones of Amhara Region, Assosa zone of B/Gumuz region, north and south Omo zones of SNNP region. Though the ad hoc groups were trying to coordinate the efforts to their level of capacity, there were obvious gaps in the achievement of aimed outcomes due to various limitations and challenges. Those limitations and challenges were attributed to various aspects including lack of institutionalization, absence of one health supportive policies and legal frameworks, lack of guiding protocols and working documents like multi-sectoral joint outbreak investigation guideline.

Cognizant of the critical requirement for developing and availing of such guiding documents to be used for proper execution of joint outbreak investigation and response through one health approach is paramount importance. Thus the NOHSC initiated the development of this Multisectoral Joint Outbreak Investigation Guideline for the mutual benefit of all key sectors to ensure active engagement and accountability among those key sectors.

The role of the One Health approach in dealing with zoonotic disease outbreaks investigations and response is tremendous and considers the role of the human, domestic animals, wildlife and environment sectors, and expertise in the proper identification and response of the health threat (diseases) and creates opportunities for sharing of resources such as data & information, facilities, personnel from the various disciplines, and economic benefit as it minimizes cost of the investigation and responses.

Therefore, the major benefits of multisectoral zoonotic diseases outbreak investigation and response are;

- Ensures effective multisectoral coordination
- Provides required information to relevant sectors
- Generate evidence for informed decisions Ensure clear role and responsibility/accountability across all relevant stakeholders
- Ensures efficient resource mobilization and utilization
- Provides opportunity for capacity building to prevent, detect, and respond to emerging and re-emerging health threats
- Contributes towards ensuring national and global health security

PURPOSE

The purpose of this Multisectoral Zoonotic Disease Outbreak Investigation Guideline is to provide cross cutting guidance on communication, coordination & collaboration, for enhancing and conducting zoonotic diseases outbreak investigation, aiming to effectively detect, prevent and control the spread of the disease outbreak.

SCOPE

This guideline is applicable towards zoonotic diseases outbreak investigation that requires multisectoral coordination through one health approach at all levels in Ethiopia.

OBJECTIVES

The objectives of this guideline are:

1. To guide the coordination and resource mobilization for the multisectoral zoonotic disease outbreak investigation
2. To ensure efficient and effective zoonotic disease outbreak investigation and initiate response activities
3. To enhance timely and effective line of communication and reporting of joint outbreak investigation among stakeholders and partners

COORDINATION

The coordination is consented with the national multisectoral zoonotic diseases outbreak investigation and response activities. The NOHSC leads the overall coordination of the national multisectoral zoonotic disease investigation (MZDOBI). The key stakeholders involved in the MZDOBI and response that requires coordination include the NOHSC, TWGs, National and sub-national public health emergency management systems, national and sub-national key one health sector offices, referral and regional laboratories, health facilities, communities and partners,. The flow chart designed for the coordination of MZDOBI involving stakeholders is illustrated in figure- 1 below.

The key one health sectors should notify any zoonotic disease rumors and/or outbreaks to the national one health steering committee (the coordinator) in order to initiate the MZDOBI and response. Besides they should coordinate and provide all the required resources (such as man power, medicine, vaccine, PPE, lab services, finance, and transport), and laboratory results timely for initiating rapid response. To execute the operation of the MZDOBI and response initiation, the NOHSC will appoint the national MZDOBI coordinator with clear role and responsibilities. Each key one health sectors designates zoonotic diseases outbreak investigation focal person.

Receiving zoonotic disease outbreak report from line ministries and understand the location, population affected and related issues.

A report of a suspected zoonotic disease outbreak can be made by a number of different people. For example, Farmers, human or animal health extension workers, human and animal health facilities, local authorities, clan/community leaders, members of the public, private service providers (medical or veterinary), and livestock traders, reporting from any of these groups should be encouraged and any report received should be taken seriously and should be followed regularly. Issues of outbreak detection sensitivity and specificity are critically important. Moreover, the commitment and collaboration of all stockholders is critical for effective multisectoral outbreak investigation and to properly direct response actions.

Failure to respond-and report may discourage future reporting of disease events, resulting in an ongoing outbreak unnoticed and uncontrolled. At the time that a disease report is first received, some basic information should be retrieved so that there will be a record of the report for future reference. At this time, the team can collect some of the main details of the event to help guide its startup and initial responses. A small amount of information can provide valuable clues about the nature of the disease, location, and the extent and time frame of the outbreak. A lot more information may be required and gathered later in the investigation when the team goes to the field.

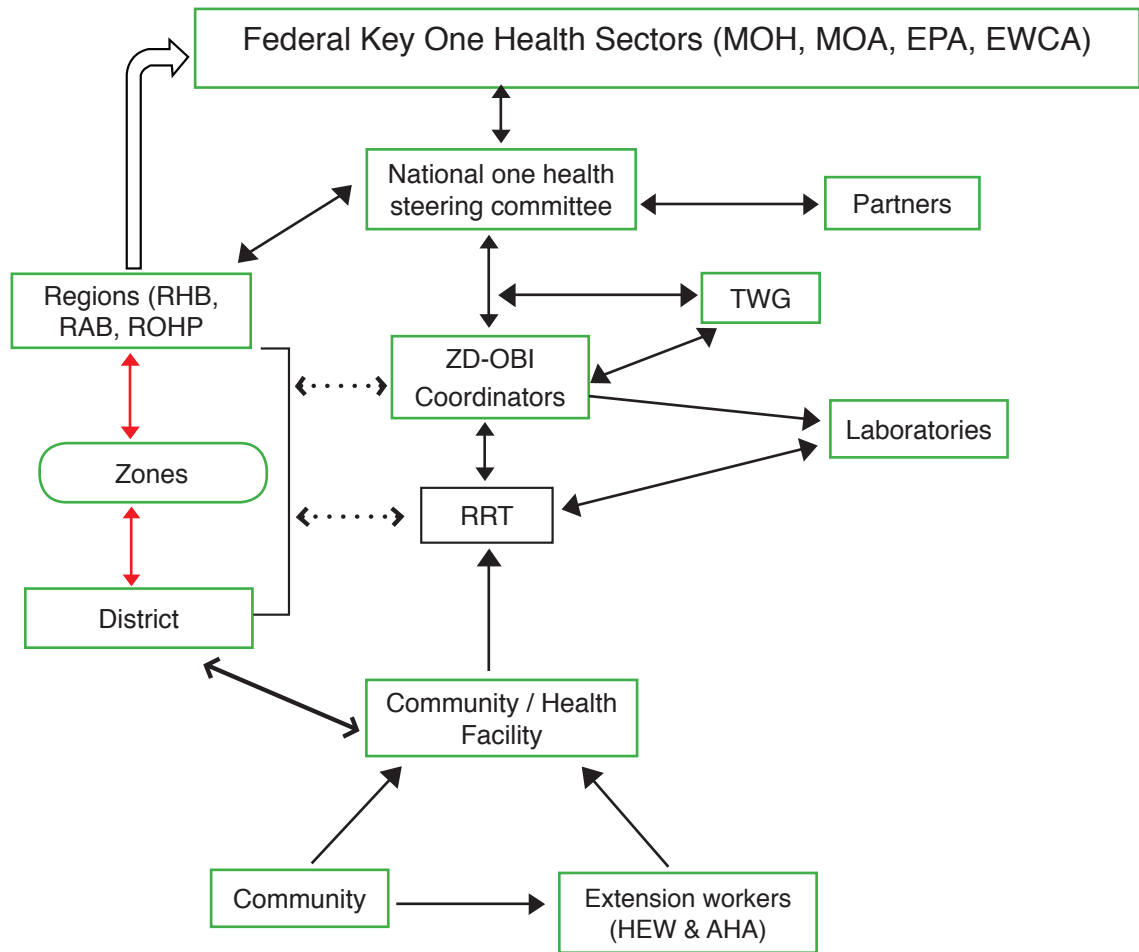


Figure-1. Flowchart of the coordination of MZDOBI and response in relation to key stakeholders

Role and responsibility of multisectoral zoonotic disease outbreak investigation and response coordinator

- Accountable to the national One Health Platform
- The coordinator closely communicate and works in consultation with the ZDs outbreak investigation and response focal person of the respective key one health sectors
- Ensure whether the suspected outbreak require joint multisectoral response
- Provide progress update regularly and upon request
- Based on the rumor identify the rapid outbreak team
- Secure the necessary resources
- Provide orientation to the ZDOBI and RRT before deployment to the field investigation
- Pledge/reactivate and deploy the ZDOBI and RRT (rapid response team)
- Lead and coordinate the field operation team
- Receive and submit the disease outbreak investigation field report
- Coordinate the laboratory investigation and report the result
- Coordinate initiation of joint and sector specific response activities
- Organize and coordinate After Action Review

MAJOR STEPS IN MULTISECTORAL ZOOONOTIC DISEASES OUTBREAK INVESTIGATION

The following are general steps that can be followed when investigating a zoonotic disease outbreak of any morbidity and mortality. It is worth remembering that not all outbreaks occurrences are not homogeneous. Thus, the ZDOBI team are not obliged to follow all these steps in every outbreak investigation.

STEP 1 Determine if a multisectoral coordinated investigation is required

As soon as the rumor/ report reached to the national ZDOBI coordinator, the coordinator will verify the incident and decide whether multisectoral ZDOBI coordination is required or not. Decisions can be made if at least one of the following criteria is met:

- Declared by WHO as a public health emergency of international concern;
- The suspected outbreak is related to one of the national priority ZDs
- The pathogen is newly identified or unknown in the locality and affect both humans and animals
- The suspected outbreak require cases isolation in one or more sectors
- The investigation and response requires involvement of multiple sector
- The suspected outbreak require guidance on biosafety and biosecurity from multiple sectors
- It require cross-border collaboration
- Accidental or deliberate release of zoonotic disease agents targeting people or animals.
- Require high level expertise, multidisciplinary engagement, and use of more advanced technologies and services

STEP 2 Establish/activate the multisectoral joint investigation team

ZDOBI and RRT requires involvement of multisectoral and multidisciplinary members in harmonized manner. The ZDOBI and RRT members drawn from relevant sectors/organizations (such as MOH, MOA, EFCCC, EWCA, Universities, research institutions, and partners) is paramount. The team will be actively engaged in the outbreak investigation and response as per the role and responsivities and finally submit the report.

2.1 Composition of ZDOBI & RRT

The proposed list of ZDOBI & RRT includes but not limited to:

- Team leader
- Medical and veterinary epidemiologists
- Clinician and infection control specialist
- Public health officer
- Nutritionist (food safety expert)
- Microbiologist (Virologist, bacteriologist)
- Pathologist
- Veterinary and medical laboratory technologists
- Environment health expert
- Wildlife veterinarian
- Entomologist
- Sociologist
- Logistician (transport, supplies, utilities, etc)
- Others

2.2 Roles & responsibilities of ZDOBI and RRT

Before deploying the multisectoral and multidisciplinary ZDOBI and RRT, identifying and clarifying the joint and specific responsibilities and roles of ZDOBI and RRT members is critical. The role and responsibilities include;

- The team should receive required orientation from relevant body before the field investigation,
- Prepare the action plan
- Ensure that the required logistics are in place or available
- Collect the required information and data according to the investigation protocol
- Submit a daily field investigation update to the coordinator
- Submit final field investigation report to the coordinator. (Frequency of reporting indicated in step 6)
- To ensure all relevant data are collected by each of the member, the following investigation protocol should be effectively in place.
 - Laboratory material required for collection, storage, transportation and testing;
 - Essential data required by all sectors;
 - Standardized forms for data collection, and for submitting samples;
 - Mechanisms for information sharing and feedback to sectors and partners

STEP 3 Preparation for field investigation

This step covers the period from the time of receiving information from the ZDOBI coordinator to the deployment of the team. The received information should include, the location the suspected outbreak, population affected and related information. Based on the information the team should prepare checklist for the field investigation.

3.1 Preparation for the field zoonotic disease outbreak investigation

- Before commencing the field activities of the ZDOBI & RRT, the coordinator along with the investigation team should solicit the necessary budget and logistics and ensure that they are well prepared for field activities. This involves making sure that;
 - The team received orientation
 - Develop protocols outlining levels of information sharing and dissemination (with in the team, with the coordinator, sectors, local authorities, community, etc)
 - A pre-agreed field deployment time line (eg. Within 24 or 48 or 72 hours of report received, depending on the nature of the expected disease).
 - Important outbreak investigation equipment's are in place/available and these include disinfection equipment, disinfectant, recording equipment, e.g. paper and pens and/or a specific form for note taking, animal restraint equipment, personal protective equipment (PPE) and basic sample collection materials.
 - The following information is required by the ZDOBI & RRT;
 - **Location:** The exact location where the outbreak investigation will be carried. The guiding questions can be raised to acquire the basic information as follows:
 - Are there any previous outbreaks in the area?
 - Are there any ongoing outbreak in the area?
 - Which segment of the community and/or livestock species and husbandry systems are affected?
 - Which main roads/transport routes are used?
 - Where are animals and animal products obtained from?
 - Where do they go once they are sold?
 - Are there any livestock markets and slaughterhouses that might be relevant to the outbreak?
 - Where are peoples coming from /came recently?
 - Prepare maps of the outbreak area
 - **Disease information** (clinical signs, morbidity and mortality data, mode of transmission, species affected animal/human, case definition of the suspected ZD, confirmed, suspected, and probable etc) Once the team are equipped with the required equipment and supplies information of the affected locations and the suspected disease (s),the team can commence the field outbreak investigation

STEP 4 Undertaking the field investigation

Field investigations are required to document the event, identify possible source(s) of infection, determine or confirm the etiology, and, to implement immediate prevention and control measures. In this regards, basic considerations to be emphasized include:

4.1 Progress update within RRT and with the ZDOBI coordinator

The ZDOBI &RRT should ensure that there are clearly defined procedures for sharing information about the outbreak investigation within the team and with the coordinator.

The investigation mission should include a plan for daily progress update. This includes:

- Communication within the team,
- The RRT leader shall communicate with ZDOBI coordinator on daily bases
- Develop protocols outlining levels of information sharing and who can approve the release information to the public and external partners
- Plan communication with local authorities, community leaders, facilities Communication with NOHSC, ZDOBI & RRT coordinator, and focal points of ZDOBI & RR, and key one health sectors)

4.2 Laboratory readiness for field investigation

All key sectors are required to make laboratory facilities ready for field investigation. The ZDOBI coordinator should communicate with focal persons to make sure that the required facilities are ready. Important considerations include:

- Availability of laboratory inputs
- Specimen collection, transportation, storage and management
- Mapping of the pathway from specimen collection to arrival at the laboratory
- Cold-chain quality and integrity, traceability of biological samples, and proper biosafety and biosecurity measures for samples and diagnostics
- Arrival of specimen on time at the laboratory

4.3 Gathering information

It is important during this stage of the investigation that the joint investigation team collects core information from individuals closely involved with the affected people and/or animals, including community leaders, local authorities, farmers, livestock owners/pastoralists and livestock traders. At this level, the team should use a standard outbreak investigation form to collect appropriate information about the outbreak.

The information should include;

- **Cases:** Affected people or animals: details of the host(s) involved in the outbreak (demography, species, breed, age, physiological status)
- **Place:** details of the geographical location of disease positive and disease-negative households, farms or villages
- **Time:** details of the time of onset of disease in affected households, farms or villages.
- **Data:** morbidity and mortality

During the data collection the team should communicate with the local authority, the kebele administrator, cluster coordinator and the household head who reported the outbreak and other farmers and stakeholders.

The approach on how the team proceeds to collect information will depend on the local situation, cultures and customs in that specific area.

The team can gather information through interview, focus group discussion, and field observation.

4.4 Verify the information collected and tentative diagnosis of the outbreak

This is an important step and ensures that the disease under investigation has been properly diagnosed tentatively. An apparent outbreak can result from either incorrect diagnoses, multiple diseases with similar symptoms, or even changes in record keeping or surveillance practices.

The investigation team should;

- Review clinical findings and determine if the reported number of cases is unusual;
- Compare current numbers with available surveillance data;
- Verify a rise in numbers is not due to changes in reporting procedures, case definition, diagnostic procedures, or increased awareness at the community level;
- Consult with the local health facilities and district health offices to check on historical event documentation/data trends and/or to see if surrounding jurisdictions are noting the same incident increment
- Verify cases are not due to Changes in case definitions or changes in local reporting procedures
- Make sure that the case results from improvements or changes in diagnostic or screening procedures

4.5 Outbreak confirmation

This step consists all the field level investigation including environmental assessment, clinical examination, report and findings cross-checking and analyse supportive evidences. Once the investigation team has confirmed that an outbreak exists, it should then proceed to:

1. Identify the possible causes of the outbreak
2. Make an initial assessment of the extent of the outbreak
3. Gather information to guide further investigation and proposed control measures.
4. Identification of the index case and all cases prevalent at the time of initial investigation

In addition the team should initiate informed rapid control measures at local level, even before a definitive diagnosis has been reached.

4.6 Sample collection, storage and transportation

Sampling is essential for the investigators diseases outbreak both in human and animal diseases outbreak. The sample to be collected, Producers used to collect samples and transportation plan has important role in getting appropriate result of disease outbreaks. Consideration of the type of samples to collect and how they should be stored and transported to the laboratory are important, because these decisions will influence the diagnostic value obtained from the samples when they are examined (tested) in the laboratory. Therefore, the team need to

- Determine sample to be collected depending on verification tentative diagnosis and collected information
- The team need to use PPE before staring collection of samples
- The team need to collect suggested sample by preventing contamination depending on sample to be collected and considering laboratory test used to detect causative agent of the diseases
- The transportation and storage of collected sample need to follow the procedures used to transport and storage of collected samples
- Sample to be collect need to adequate samples for analysis

STEP 5 Laboratory test/diagnosis

The laboratory examination assists outbreak investigators are advised on the range of plausible organisms and toxins involved in an outbreak management to help focus the epidemiological and environmental components of the investigation. The laboratory diagnosis should consider the following key points;

- A focal person of the laboratory should be identified and contacted all the time during the investigation period by RRT team leader and/or investigation team coordinator...
- The investigators should also request the laboratory to save specimen for further analysis
- The laboratories should follow SOPs for sample testing.
- The result should be notified within one to seven days of the sample submission (exceptions may be considered when there are uncertainties that might need the coordinator's judgment based on the tentative diagnosis and type of sample collected).

STEP 6 Environmental investigation

Environmental surveys are important in some settings (E.g. Vector-borne diseases, common source infections or poisonings, etc.) as they help in explaining why an outbreak occurred and identify to break the disease transmission cycle. Thus the epidemiologic, environmental, and laboratory complement each other for the confirmatory diagnosis or ruling out of the suspected disease. Preferably, using a camera to photograph the environmental conditions helps to capture visual evidences for further analysis.

STEP 7 Tracing cases

The source of infection can be anything capable of bringing a disease agent from an infected animal or person in one area to a susceptible population in another area, or at another time, and establishing an outbreak. During the field investigation team should consider tracing of initial cases to know source of infection that can be;

- An infected animal or person showing clinical signs
- A sub-clinically infected an animal or person incubating the disease,
- A vehicle or person that has visited an infected area and carries the disease agent
- Contaminated animal products and by-products.

The information collected during tracing can be used to:

- Find affected areas and implement control measures in those areas to limit further spread
- Find the source and implement control measures to prevent further exposure to the source
- Provide information on possible sources and routes of spread to help prevent future outbreaks.

STEP 8 Communicating the investigation progress and findings

A coordinated approach to communication is an essential part of outbreak investigation activities. The final task at this stage is to summarize the investigation, its findings, and its outcome in a report, and to communicate this report in an effective and confidential manner. This communication can take two forms:

8.1 Oral communication

This communication is done by the field investigation team. Accordingly, an oral **briefing is done for local authorities** (key one health sectors), frontline health workers (Vets, Animal Health Assistants/AHA, Health Extension Workers, etc.) and other agencies for whom the information is useful. It should describe what has been done, what is found, conclusion and recommendation in a scientific manner. Local leaders can be called upon to inform the public/community on the risk communication as well as to build public cooperation and support in responding to the outbreak and recovery measures.

8.2 A written report

The ZDOBI & RRT shall submit a preliminary findings report within 48 hours and a final outbreak investigation report within 7 days to the coordinator after the investigation of an outbreak is completed. The team should provide a blueprint for action, a record of performance, serves as a reference and a document for potential legal issues. This report should follow, scientific standard format that include introduction, background, methods, results, discussion, and recommendations. The coordinator should submit the report to the NOHSC.

Simultaneously, the NOHSC should communicate the report received from the ZDOBI coordinator to the respective key one health sectors for initiating sector specific response and public communication as well as international reporting as deemed necessary.

STEP 9 Initiate prevention and control measures

The joint ZDOBI & RRT is required to initiate control and preventive measures at local level as soon as possible, depending on the output of the disease outbreak investigation. In addition the ZDOBI coordinator and the NOHSC shall initiate sector specific ZD preventive and control measures together with sector focal persons. The coordinator shall undertake the monitoring of preventive and control measures and provides feedback to each sector.

Control measures are usually directed against one or more segments in the chain of transmission (this include agent, source, mode of transmission, portal of entry, or host) that are susceptible to intervention; directed at controlling or eliminating the agent at its source; and for an environmental toxin or infectious agent that resides in soil, the soil may be decontaminated or covered to prevent escape of the agent.

Control strategies fall into three major categories of activity.

- Control and prevention measures specific for the disease.
- Prevent exposure:- the source of infection is reduced to prevent the spreading
- Treat cases with recommended treatment as in national or WHO and OIE guidelines

NB; A successful coordination of multisectoral zoonotic diseases outbreak investigation requires integration of a multisectoral zoonotic diseases surveillance system and data/information sharing mechanism among all relevant sectors.

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APPENDIXES

Annex 1 Case definition

Case definition: in epidemiology, set of criteria used in making a decision as to whether an individual (animal or human) has a disease or health event of interest. The use of case definitions is very important in epidemiology in order to standardize criteria for identification of cases. All case definition must include the three classical dimensions of epidemiological variables: *time, place* and *person/animal*. It is of foremost importance to precisely define what will be considered as a case, in order to accurately monitor the trends of reported diseases, to detect their unusual occurrences and, consequently, to evaluate the effectiveness of intervention. Thus, the usefulness of public health surveillance data depends on its uniformity, simplicity and timeliness. Hence, establishing a case definition is an imperative step in quantifying the magnitude of disease in a population. Case definitions are used in ongoing public/animal health surveillance to track the occurrence and distribution of disease within a given area, as well as during outbreak investigations in field epidemiology.

A case definition must be clear, simple, and concise, allowing it to be easily applied to all individuals in the population of interest. It typically includes both clinical and laboratory characteristics, which are ascertained by one or many methods that might include diagnosis by a physician, completion of a survey, or routine population screening methods. Individuals meeting a case definition can be categorized as “confirmed,” “probable,” or “suspected.” The definition of terms used in this list for case classification is established as follows:

Clinically compatible case: a clinical syndrome generally compatible with the disease, as described in the clinical description.

Confirmed cases: These are usually laboratory confirmed cases. Confirmed cases are best, because they are the most definitive. For most infectious diseases there will be a considerable number of infected individuals that have only mild symptoms or no symptoms at all (subclinical cases), and correctly identifying them as cases will rely on laboratory testing.

Epidemiologically linked case: a case in which (a) the patient has had contact with one or more persons who either have/had the disease or have been exposed to a point source of infection (i.e., a single source of infection, such as an event leading to a foodborne-disease outbreak, to which all confirmed case-patients were exposed) and (b) transmission of the agent by the usual modes of transmission is plausible. A case may be considered epidemiologically linked to a laboratory-confirmed case if at least one case in the chain of transmission is laboratory confirmed.

Laboratory-confirmed case: a case that is confirmed by one or more of the laboratory methods listed in the case definition under Laboratory Criteria for Diagnosis. Although other laboratory methods can be used in clinical diagnosis, only those listed are accepted as laboratory confirmation for national reporting purposes.

Probable cases: These usually have characteristic clinical features of the disease, but lack laboratory confirmation, e.g., animals/individuals with bloody diarrhea that suspected of gastro-intestinal infection caused by Salmonellosis, but without laboratory confirmation.

Possible cases: These have some of the clinical features, e.g., abdominal cramps/colic and diarrhea, but lack specific clinical signs.

Suspected case: an individual/animal that is classified as suspected for communication/ reporting purposes.

National and international organizations have published lists of uniform case definitions for the mandatory reporting of select diseases. Such lists provide explicit case definitions, enabling clinicians and veterinarians to report cases for diseases of interest to public/animal health authorities in a standard and uniform way across geographic locations. This is particularly useful for studies that compare the incidence and prevalence of disease across regions, since they can use the same case definitions and, therefore, obtain a relatively accurate assessment of disease.

During an outbreak of disease, a case definition is developed at an early stage of the outbreak investigation, facilitating the identification of individual cases. While the same criteria apply for developing a case definition in routine public health surveillance, in an outbreak investigation a case definition may also include information regarding person, place, and time, in addition to clinical and laboratory characteristics. For example, a case definition developed for an outbreak of foodborne illness may include only those individuals (animal or human) who grazed or ate at a certain pasture/restaurant during a specified period of time. Furthermore, a case definition may be broadly defined in the initial stages of an outbreak investigation scenario in order to increase sensitivity, permitting the recording of as many cases as possible while also minimizing the possibility of overlooking cases. As the investigation continues and more knowledge is gained about the nature of the cases, the definition may be narrowed, making it more specific. This is particularly important for a newly emerging disease where a standard case definition does not yet exist.

Annex 2 Outbreak reporting Template

Title/Description (include disease/condition investigated)

Period: _____ to _____

Place (Villages, Woreda, Region) _____

1. Executive summary:

Introduction

- Background
- Reasons for investigation (public health significance, threshold met, etc.)
- Investigation and outbreak preparedness

Methods

- Dates of investigation
- Site(s) of investigation (health care facilities, villages, other)
- Case finding (indicate what was done regarding case finding, e.g., register review, contact investigation, alerting other health facilities, other)
- Lab specimens collection
- Description of response and intervention (include dates)
- Data management

Results

- Date and location of first known (index) case
- Date and health facility where first case was seen by the health care system
- Results of additional case finding
- Lab analysis and results
- With text, describe key features of results of time, place, and person analysis
- For detailed results by time (epi curve), place (map), and person characteristics (tables) and line lists
- Results of response and evidence of impact

2. Self-evaluation

Epidemic Preparedness

- Were adequate drugs and medical supplies available at the onset of the outbreak
- Were treatment protocols available to health workers?
- Does the district epidemic management committee regularly meet as part of
 - epidemic preparedness?

Outbreak Detection

- Interval between onset of index case (or occurrence of an unusual cluster at the community level) to arrival of first outbreak case at the health facility (Target: <3 days)
- Interval between initial outbreak case seen at the health facility (or date of outbreak threshold crossing at the health facility) and reporting to the district health team (Target: within 24 hours)
- Cumulative interval between onset of index case (or occurrence of an unusual cluster at the community or health facility) to notification to the district (Target: <7 days)

Outbreak investigation

- Were case forms and line lists completed?
- Were laboratory specimens taken (if required)?
- Interval between notification of district and district field investigation conducted (Target: within 48 hours)
- Interval between sending specimens to the lab and receipt of results by the district (Target: 3-7 days, depending on type of test)

Outbreak response

- Interval between notification of outbreak to district and concrete response by the woreda (Target: within 48 hours of notification)
- Evaluation and Feedback
- Interval between end of the outbreak and finalization of outbreak report with case forms/line list sent to national level (Target: 2 weeks)
- Did the outbreak management committee meet to review investigation results?
- Was feedback given to health facilities and community?

3. Interpretations, discussion, and conclusions:

4. Recommended public health actions:

- Comment on following levels: community, health facility, district, partners, provincial, and national

Name Signature of investigators: _____

Date reported completed: _____

Annex 3. Checklist of laboratory supplies for use in an outbreak investigation

For using standard safety precautions when collecting and handling all specimens:

- Pieces of bar soap and bleach for setting up hand-washing stations
- Supply of gloves
- Safety boxes for collecting and disposing of contaminated supplies and equipment

For collecting laboratory specimens:

Blood

- Sterile needles, different sizes
- Sterile syringes
- Vacutainers
- Test tube for serum
- Antiseptic skin disinfectant
- Tourniquets
- Transport tubes with screw-on-tops
- Transport media (Cary-Blair, Trans-Isolate)

Blood films (malaria)

- Sterile or disposable lancet
- Glass slides and cover slips
- Slide box

Respiratory specimens

- Swabs
- Viral transport medium

Cerebral spinal fluid (CSF)

- Local anesthetic
- Needle and syringe for anesthetic
- Antiseptic skin disinfectant
- Sterile screw-top tubes and tube rack
- Microscope slides in a box
- Trans- Isolate transport medium
- Latex kit
- Gram stain
- May Grunwald Giemsa Kit

Stool

- Stool containers
- Rectal swabs
- Cary-Blair transport medium

Plague

- Gram stain kit
- Rapid diagnostic test (dipstix AgF1)
- Cary-Blair transport

If health facility has a centrifuge:

- Sterile pipette and bulb
- Sterile glass or plastic tube, or bottle with a screw-on top

For packaging and transporting samples:

- Cold box with frozen ice packs or vacuum flask
- Cotton wool for cushioning samples to avoid breakage
- Labels for addressing items to lab
- Labels for making «store in a refrigerator» on outside of the shipping box
- Case forms and line lists to act as specimen transmittal form
- Marking pen to mark tubes with patient's name and ID number (if assigned by the woreda)

Appropriate personal protection (PPE) (for diseases such as VHF, suspected avian influenza, etc.)

Annex 4 Recommended list of personal Protective Equipment (PPE)

The following equipment should be available for the personal protection of all staff investigating suspected outbreaks of unknown illness especially if suspected of viral hemorrhagic fever or avian or pandemic influenza.

Composition of one set of PPE	WHO Deployment Kit
1 surgical gown	100 surgical gowns
1 coverall	100 coveralls
1 head cover	100 head cover
2 pairs of goggles	50 pairs of goggles
1 pair of rubber gloves	100 pairs
1 mask N95	200 pieces
1 boot cover*	0
1 box 50 pairs of examination gloves	800 pairs of examination gloves
1 plastic apron re-usable	20 pieces
1 pair of gum boots	20 gum boots
1 hand sprayer	2 of 1.5 liters each
1 Back sprayer	1 back sprayer of 10-12 liters
specimen containers	
Scotch of tapes	3 rolls
Anti-fog for goggles	3 bottles
Chlorine	

Annex 5 List of contributors

List of contributors in the development of multisectoral ZDOBI guideline

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