A tool for cross-sectoral prioritization of zoonotic diseases, and mapping of systems for One Health coordination
**ONE HEALTH SYSTEMS ASSESSMENT FOR PRIORITY ZOONOSES**

A tool for cross-sectoral prioritization of zoonotic diseases, and mapping of systems for One Health coordination

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- **2014** Jordan: Field Epidemiology Training Program, Ministry of Health; Ministry of Agriculture.
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- **2015** Algeria: Institute Pasteur; Institute National De La Médecine Vétérinaire; Centre de Recherche en Biotechnologie
- **2016** Guinea: Ministère de la Santé; Ministère de l’Élevage; Ministère de l’Environnement;
  Iraq: Centers for Disease Control, Ministry of Health; Veterinary Health Services, Ministry of Agriculture;
- **2021** Libya: National Centre for Disease Control; National Centre for Animal Health; Environment General Authority
- **2023** Jordan: Ministry of Health; Ministry of Agriculture; Ministry of Environment
  Iraq: Ministry of Health; Ministry of Agriculture; Ministry of Environment (Federal Government and Kurdistan Regional Government)
Implementing global health security policies and programs requires the support and partnership of nations, international organizations, and public and private stakeholders to reduce the global threat of public health in building capacities to prevent avoidable incidents, detect threats early, and respond and recover rapidly and effectively across the world.

In 2012, the George Washington University Milken Institute School of Public Health’s Global Health Security Program developed an assessment and gap analysis methodology to map public health and veterinary systems used to detect and report priority zoonotic diseases, focusing on surveillance and laboratory networks. Piloted in Jordan and Egypt in collaboration with each respective country’s Field Epidemiology Training Program, the methodology was later also applied in Algeria and Iraq. In 2016, the tool developers, via Georgetown University and with funding from the U.S. Centers for Disease Control Prevention, refined the methodology to align it more directly with the milestones and indicators under IHR and GHSA, and expanded it to explicitly include the environmental health sector, for a more holistic One Health approach. The revised tool was piloted in Guinea, in collaboration with the Ministries of Health, Livestock, and Environment. Following this collaboration, the One Health Systems Assessment for Priority Zoonoses (OHSAPZ) manual was formalized and published online, freely available to download and use at no cost. In 2020-21 the tool was piloted for use in a remote setting, in partnership with Libya’s National Centre for Disease Control and National Centre for Animal Health.

In 2023, Johns Hopkins University joined the collaboration. Based on lessons learned from the COVID-19 pandemic with respect to adapting materials for hybrid or remote implementation, the manual—including templates and related resources—were updated to better assist partner countries in using the OHSAPZ tool. In addition, the need for consideration of zoonotic disease threats across borders led to further adaptation of OHSAPZ, in this case to assess, map and analyze transboundary zoonotic disease threats, with a particular focus on land crossing points of entry. The One Health Transboundary Assessment for Priority Zoonoses (OHTAPZ) manual is under development and can be used in coordination with OHSAPZ or as a stand-alone tool.
Despite significant investments in technology, knowledge, and the availability of the frameworks and programs, many countries still face significant gaps in their abilities to prevent, detect, and respond effectively to public health threats, including zoonotic diseases.

Domestic animals and wildlife are well-known reservoirs of many diseases of public health significance; roughly 75% of recent emerging infections and 60% of all human pathogens are of zoonotic origin. Zoonotic diseases present a significant threat to public health systems; however, many remain neglected due to additional strains on Ministries of Health, including competing priorities for the prevention of non-communicable diseases and maternal and child health programs. Moreover, disruptions stemming from outbreaks and public health events often have severe ramifications to agricultural, environmental, trade, tourism, energy, civil protection, and/or transportation sectors in addition to healthcare systems. Several international frameworks serve to guide the establishment and sustainment of capacities related to control of infectious diseases, and even have indicators related specifically to coordination in the event of zoonotic disease events.

OVERVIEW

In response to the recurrence of zoonotic threats, modern global health initiatives have adopted the One Health approach to health systems strengthening efforts and emerging infectious disease detection and response activities with the ultimate goal of integrating human, animal and environmental health sectors. Zoonotic disease threats are complex, often multifactorial, and can encompass a variety of species as reservoir and/or intermediate hosts and may result in transboundary spread. Therefore, robust and progressive One Health mitigation and response strategies require concerted efforts that first identify related networks and outline operational interdependencies between public health and all other relevant sectors. There is a clear need for holistic One Health methodologies that capture interdisciplinary approaches for national outbreak preparedness and response strategies, as well as adaptable frameworks and metrics designed to accommodate dynamic environments with differing capabilities.

THE OHSAFPZ METHODOLOGY is a phased approach to engage human, veterinary and environmental health sectors in the development of a consensus priority zoonotic diseases list.

The methodology uses case study scenario discussions to examine the structures and mechanisms for communication and coordination between and within governmental sectors.

The discussions are used in the creation of systems map schematics; and provides a framework for analyzing strengths and weaknesses of existing intersectoral coordination in order to help identify gaps and develop targeted recommendations to strengthen One Health capacity and coordination.

The overall goal of the assessment tool is to help identify priorities and gaps that limit information-sharing for action through an examination of coordination and communications from the index case to notification at the national and international levels, focusing on zoonotic diseases seen as a priority by all implicated sectors.

INTRODUCTION

Domestic animals and wildlife are well-known reservoirs of many diseases of public health significance; roughly 75% of recent emerging infections and 60% of all human pathogens are of zoonotic origin. Zoonotic diseases present a significant threat to public health systems; however, many remain neglected due to additional strains on Ministries of Health, including competing priorities for the prevention of non-communicable diseases and maternal and child health programs. Moreover, disruptions stemming from outbreaks and public health events often have severe ramifications to agricultural, environmental, trade, tourism, energy, civil protection, and/or transportation sectors in addition to healthcare systems. Several international frameworks serve to guide the establishment and sustainment of capacities related to control of infectious diseases, and even have indicators related specifically to coordination in the event of zoonotic disease events.
RELEVANT INTERNATIONAL FRAMEWORKS

THE INTERNATIONAL HEALTH REGULATIONS (2005)

The IHR (2005), which entered into force in 2007, focus on strengthening capabilities to confront all potential “public health emergencies of international concern” when and where they occur, building networks that can prevent local public health crises from becoming international catastrophes. States Parties committed to developing core capacities to detect, assess, report, and respond to any public health event that might cross borders, whether of natural, accidental, or deliberate origin. Annex 1 of the IHR (2005) defines the core public health capacities that must be developed to achieve compliance: national legislation and policies, coordination, surveillance, response, preparedness, risk communications, human resources, and laboratories, as well as measures at designated points of entry and efforts to address additional hazards, including zoonotic diseases, foodborne disease, chemical safety and radiological safety. Assessment of IHR (2005) compliance is achieved through the Monitoring and Evaluation Framework (MEF), which consists of mandatory annual self-assessment reporting via the State Party Self-Assessment Annual Reporting (SPAR) tool, voluntary external assessment every four to five years via the Joint External Evaluation (JEE) process, and the requirement to conduct at least one After Action Review (AAR) of a naturally occurring event or Simulation Exercise (SimEx).

THE WORLD ORGANISATION FOR ANIMAL HEALTH TERRESTRIAL ANIMAL HEALTH CODE

The World Organisation for Animal Health (WоAH, founded as OIE) is an intergovernmental organization aimed at improving animal health and fighting animal diseases. The WоAH Terrestrial Animal Health Code (the Terrestrial Code) sets standards for improvement of animal health and veterinary health, including standards for international trade of animals and their products. The standards have been formally adopted by WоAH Members since 2003. While not directly related to zoonotic diseases, WоAH developed the Aquatic Animal Health Code (the Aquatic Code) which sets standards for the improvement of aquatic animal health worldwide and includes standards for the welfare of farmed fish and use of antimicrobial agents in aquatic animals. The most recent version of the Aquatic Code was published in 2022. In addition to publishing the Terrestrial and Aquatic Code, another major point of focus for WоAH is on the development of sustainable and quality veterinary services in its 182 member countries through the Performance of Veterinary Services Pathway “PVS Pathway.” Two of the four stages of the PVS Pathway include conducting:

1) A PVS Evaluation using the “Tool for the Evaluation of Performance of Veterinary Services: Terrestrial”, which is a qualitative diagnosis on compliance with quality standards and includes 45 critical competencies.

2) A PVS Gap Analysis that includes strategic priorities and capacity building.

Focused on the human-animal interface, the IHR-PVS National Bridging Workshop (NBW), facilitated by WHO and WоAH, gathers human and animal health stakeholders to jointly identify actions that support multisectoral collaboration while also advancing sector-specific evaluation goals identified through the IHR-MEF, specifically the JEE or SPAR, and WоAH PVS Pathway. During seven sessions that take place over three days, the end result of the IHR-PVS NBW process is the creation of a realistic, concrete and practical joint road map for sectors to implement in order to improve the nation’s prevention, detection and response efforts to zoonotic diseases and other health events such as food safety, food security and antimicrobial resistance.

FAO-WоAH-WОAH-UNEP QUADRIPARTITE COLLABORATION

In 2010, recognizing the importance of multisectoral engagement within the One Health approach, the Food and Agriculture Organization of the United Nations (FAO), WоAH, and WHO formalized their collaboration in the FAO-WоAH-WОAH-UNEP Quadripartite, releasing The Tripartite Concept Note. Additional strategic documents were released in 2017 and 2019; the first expanded the scope of the Tripartite collaboration to include strengthening of health services, early warning and surveillance, food safety, neglected tropical diseases, and research and development. The 2019 guide entitled, “Taking a Multisectoral, One Health Approach: A Tripartite Guide to Addressing Zoonotic Diseases in Countries (TZG)” expands the 2010 Concept Note to include prevention, preparedness, detection and response to zoonotic diseases with examples of best practices and country experiences. The TZG provides a suite of operational tools to assess and strengthen capacities.

One of these tools, the Surveillance and Information Sharing Operational Tool (SIS OT), was developed to support countries in creating, strengthening or sustaining coordinated, multisectoral surveillance and information sharing for zoonotic diseases.

In 2021, the Quadripartite organizations called on the United Nations Environment Programme (UNEP) to join this collaborative effort, acknowledging the importance of the environmental dimension in the One Health approach. The four organizations signed a memorandum of understanding (MoU) in 2022 to reflect a change from the Tripartite to a new Quadripartite partnership, with UNEP as an equal partner. Together, the Quadripartite created the One Health Joint Plan of Action (2022–2026) (OH JPA), using previously developed strategic documents, MoUs, recommendations, and resolutions, to (1) Guide these organizations in working together on One Health efforts, and (2) Support each organization’s respective Members, Member States, and State Parties build their One Health capacities. The OH JPA aims to supplement existing global and regional One Health initiatives that address multidimensional health risks with resilient health systems. It considers regional and national contexts, priorities, and capacities for implementing One Health policies, strategies, and interventions. While not a binding policy document, the OH JPA provides a framework and proposes activities for nations to advance and sustainably scale up One Health.
The objective of this tool is to facilitate the systematic assessment of the structures in place for One Health coordination with respect to preventing, detecting, and responding to zoonotic diseases. Through a three-phase process, the tool supports the development of a list of priority zoonotic diseases; uses these identified priority diseases as case studies to examine the structures and mechanisms for communication and coordination between and within sectors, at all levels of the health system; and provides a framework for analyzing collected data to help identify gaps and develop recommendations for action.

**Objective**

The objective of this tool is to facilitate the systematic assessment of the structures in place for One Health coordination with respect to preventing, detecting, and responding to zoonotic diseases. Through a three-phase process, the tool supports the development of a list of priority zoonotic diseases; uses these identified priority diseases as case studies to examine the structures and mechanisms for communication and coordination between and within sectors, at all levels of the health system; and provides a framework for analyzing collected data to help identify gaps and develop recommendations for action.

**Process**

The tool consists of a three-phase process of prioritization, systems mapping, and analysis and recommendations, outlined below in Figure 1. Each phase has accompanying steps to consider and address before proceeding to the next phase. While this tool has been developed in collaboration with a number of stakeholders in low- and middle-income countries it is amenable to adaptation for a variety of national contexts and can be adapted to meet the need.

**PHASE I. Prioritization**

In order to determine the mechanisms that promote and/or prevent information sharing across surveillance and laboratory networks both within and among ministries, it is first important to identify all relevant stakeholders in One Health from public health, agriculture/veterinary, environmental and wildlife (where applicable) sectors and confirm their support of the effort. Secondly, it is important to begin prioritization with a literature review to identify information on the distribution, prevalence, and burden of zoonotic diseases in the country before reviewing and agreeing to priority zoonoses. While this guidance document outlines sequential steps of identifying One Health focal points, mapping stakeholders and conducting a literature review, it is recognized that the order of Step 1 and 2 may depend on the user’s familiarity with the country context and can be adapted to meet the need.

**Objective:** Create consensus list of approximately five priority zoonotic diseases for consideration

**Step 1:** Selecting Stakeholders

Achieving political support for the disease prioritization and subsequent systems assessments is fundamental to the overall process. Without such support, the outcomes of the process are unlikely to be widely accepted and will be of limited functional utility. The primary governmental sectors whose support will be required to perform the disease prioritization and implement the systems assessment are the ministry in charge of public health (usually the Ministry of Health), the ministry with oversight for veterinary, livestock and wildlife health (usually the Ministry of Agriculture or Livestock Development) and the ministry responsible for environmental health (climate), management and protection (usually the Ministry of Environment). Support from these primary stakeholders should be achieved at a sufficiently high level to guarantee acceptance of the outcomes across the involved sectors, and to ensure the engagement and participation of all relevant agencies and departments under each ministries’ purview. It is extremely important to ensure all relevant stakeholders are at the table before the process to identify priority pathogens begins. In most cases, ministries have their own priority zoonoses that may align with national or regional frameworks or notifiable disease lists (IHR, Terrestrial Animal Health Code, IDSR). In some cases, Ministries of Health have their own Zoonotic Disease Units or Departments that operate separately from Ministry of Agriculture and/or Environment based on human-centric priority zoonoses. Each sector will likely work with specific non-governmental partners, who may each have valuable perspectives on disease status and priority in the country. In addition, there may be diseases that are of particular concern at the regional level, and which are the focus of control efforts from regional networks, international organizations, and other non-governmental or civil society actors. The primary ministries should serve as the One Health focal points or look to their One Health Committees to identifying and inviting participation from non-governmental stakeholders, with the view of ensuring national ownership of the disease prioritization, and subsequent systems assessment, processes (Figure 3). A template to facilitate with the selection of stakeholders is available as Appendix A.

**Step 2:** Literature Review

**Step 3:** Selection Criteria for Disease Prioritization

**Step 4:** Selecting Priority Diseases

**PHASE II. Systems Mapping**

The phase of systems mapping is central to the process. It is in this phase that information sharing and coordination between sectors, at all levels of the health system, can be “mapped” to identify gaps, strengths and weaknesses of existing intersectoral coordination, and develop recommendations for actions to address the gaps.

**Objective:** Use priority zoonotic diseases as case studies to “map” existing processes for information sharing and coordination between sectors, at all levels of the health system

**PHASE III. Analysis and Recommendations**

The phase of analysis and recommendations is where the gaps identified in Phase II are addressed by analyzing the strengths and weaknesses of existing intersectoral coordination, and developing recommendations for actions to address the gaps.

**Objective:** Use the systems maps to analyze the strengths and weaknesses of existing intersectoral coordination, and develop recommendations for actions to address the gaps

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**Figure 1.** The OHSAPZ three-phase process.

**Figure 2.** Overview of steps for Phase I (Prioritization).

**Figure 3.** Possible Areas of Systems Assessment.
**PHASE 1**

**STEP 1: Selecting Stakeholders**

Identify ministry in charge of:
- Human disease ministry
- Animal disease ministry
- Environment ministry

Consider sector-specific partners
- Detection, reporting & response

Consider other national programs and regional priorities
- Regional networks/orgs
- International organizations
- NGOs
- Civil society & other actors

- Review prospective stakeholders with primary ministries

- Disease prioritization participants

**STEP 2: Conducting a Literature Review**

We recommend that the prioritization begin with a literature review, to ensure that data on all potentially relevant zoonotic diseases are available at the start of the prioritization process. Each country will have its own information resources and databases, as well as methodologies for literature reviews; the aim is to use the literature review process to identify information on the distribution, prevalence, and burden of zoonotic diseases in the country, and begin to identify key stakeholders. A template to facilitate with data collection and analysis for the literature review is available as Appendix B. Identifying ministerial focal points or designating a committee that can organize efforts on the literature review can be a helpful mechanism to ensure all national and regional databases are considered.

A variety of resources can be referenced including, but not limited to: ministerial weekly or monthly epidemiological bulletins from all relevant sectors; World Animal Health Information System (WAHIS) Database Interface; ProMED; WHO’s Disease Outbreak News (DONs); partner institutions who are members of the Global Outbreak Alert and Response Network (GOARN); AFRO; EMRO; EURO; PAHO; peer-reviewed published literature; regional surveillance and laboratory disease network reports, etc.

In general, zoonoses can be classified based on etiology and their impact from a One Health perspective. Zoonoses can be classified into three major categories according to impact at the animal-human-environmental interface: endemic, epidemic prone and emerging zoonoses. Endemic zoonoses are responsible for the majority of human cases and impact on livestock production and can be found in many places. Epidemic zoonoses are sporadic in temporal and spatial distribution compared to endemic zoonoses but may be higher priorities for stakeholders because of their unpredictability and at times pathogenicity. Emerging or re-emerging zoonoses are relatively rare however often occur as outbreaks. They are either new to a population or are rapidly increasing in incidence or geographical range. These categories can serve as a basis to organize diseases based on your literature review and may help to inform the development of the qualifying criteria (see Step 3).

**STEP 3: Selection Criteria for Disease Prioritization**

Once stakeholders have been identified and individuals selected for the disease prioritization process, it is important to determine as a collective, the key selection criteria for assigning priority to your list of zoonoses. This step is not disease-specific; it instead involves discussion and review on the level of importance for each criterion when selecting national priority zoonotic diseases. Some countries may want to review and consider both national and regional or potential transboundary zoonoses while others may feel it is important to consider global threats that have the potential for spread to their region based on changing climate, vector distribution, human migration and other factors. A number of qualifying criteria can be considered, and/or added, for each country depending on priorities across the relevant stakeholders. Table 1 is not exhaustive but includes some of the key considerations; it is however important that stakeholders review and determine collectively the key criteria that will be used to assess and select the top five priority zoonoses to be included in the mapping process. Indeed, ministries may consider different qualifying criteria to be more or less essential, which are important subjective distinctions to bring to the overall prioritization discussion. A template to facilitate with determining key selection criteria is available as Appendix C.

Table 1 List of the qualifying criteria when considering the selection of priority zoonoses. Note, the list order does not indicate a rank of importance in criteria selection.

<table>
<thead>
<tr>
<th>Qualifying Criteria</th>
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<tbody>
<tr>
<td>Endemic in country</td>
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<tr>
<td>Outbreak potential in country</td>
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<tr>
<td>Emerging in country</td>
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<tr>
<td>Potential for endemic or pandemic in humans or animals</td>
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<tr>
<td>Pathogen of international concern – reportable to WHO</td>
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<tr>
<td>Pathogen of international concern – reportable to WOAH</td>
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<tr>
<td>Large disease burden in humans</td>
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<tr>
<td>Large disease burden in livestock or domestic animals</td>
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<tr>
<td>Large disease burden in wildlife</td>
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<tr>
<td>Listed on MOH notifiable disease list</td>
</tr>
<tr>
<td>Listed on MOA notifiable disease list</td>
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<tr>
<td>Regional priority disease</td>
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<tr>
<td>Available control strategies/programs</td>
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<tr>
<td>Available laboratory diagnostics (central and sub-national level)</td>
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<tr>
<td>Mechanisms for improved stakeholder communication</td>
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<tr>
<td>and coordination</td>
</tr>
<tr>
<td>Available treatments</td>
</tr>
<tr>
<td>Economic or social impact</td>
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<tr>
<td>Bioterrorism potential</td>
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**PHASE II: Systems Mapping**

The systems mapping phase involves applying the national priority zoonotic diseases identified in Phase I, to “map” existing processes for information sharing and coordination between sectors at all levels of the health system. This approach allows for a robust and detailed evaluation of the processes supporting zoonotic disease management and creates disease schematics that allow visualization of existing capacities.

**STEP 4: Selecting Priority Diseases**

The final priority disease list is based on consensus agreement among participating stakeholders, via a facilitated discussion by OH focal points or the One Health Committee. It is important that each sector have an opportunity to present their selected criteria and relevant diseases for consideration so consensus can be achieved.

The target number of priority pathogens is five, to align with the surveillance of zoonotic diseases indicator for the One Health System (OHSAPZ). The systems mapping phase involves applying the national priority zoonotic diseases identified in Phase I to “map” existing processes for information sharing and coordination within sectors and between sectors at all levels of the health system. This approach allows for a robust and detailed evaluation of the processes supporting zoonotic disease management and creates disease schematics that allow visualization of existing capacities.

**STEP 5: Scenario-based discussion**

The priority zoonotic diseases identified in Phase I will be used in scenario-based discussions to identify the nodes of communication and coordination within and among sectors and to gather data on national and sub-national systems for prevention and management. The first step in this process is to develop disease-specific scenarios for each priority disease. The scenarios should be fictional, though set in a context similar to that of the country conducting the assessment, for maximum relevance. Data collected during the literature review (Phase I, Step 2) can be used to inform your scenario development. Each scenario should be developed considering roles and responsibilities for the identified stakeholders (Phase I, Step 1) and follow the recommended seven steps outlined in Figure 5 from prevention to international notification and response.

Additional activities associated with disease management, such as social mobilization, risk communication, advocacy, and recovery canbe added to support national disease control priorities. One Health focal points or the One Health Committee should lead in scenario development and facilitation with all relevant stakeholders. A template to facilitate with the development of event scenarios is available as Appendix E. A basic outline for PowerPoint presentation of disease scenarios and note taking is available as Appendix F and G.

As noted above focal points should guide scenario discussions with relevant sector stakeholders to ensure each sector provides inputs (where applicable) and responds to existing actions, mechanisms, and protocols at each level of the health/administrative system (local, intermediate, and national, as well as international reporting requirements to relevant authorities). Particular attention should be paid to exploring where communication and coordination occurs between sectors and across the levels of the health/administrative system. If there are a large number of stakeholders, the discussion can be broken up into smaller groups however, each group should have a facilitator and be cross-sectoral, to ensure capture of (and agreement on) situations where information is currently shared between sectors. A disease narrative template that can be used to record information for each stage of the disease control and management process is available as Appendix H.

**STEP 6: Site visits, stakeholder interviews, and supplemental data collection**

The stakeholder scenario-based discussions will constitute the major source of assessment data for the disease schematics. However, where possible, these data should be complemented, and where needed validated, by site visits, stakeholder interviews, and other forms of supplemental data collection.

High priority sites for visits may include key surveillance departments, clinics and laboratory facilities across the national and subnational health system, particularly if they had not been involved in case study discussion. Specific capabilities or programs that have been procured and/or developed to aid disease management, whether they be vertical or horizontal disease programs, should also be observed; examples may include mobile laboratory units, a public health emergency operations center, zoonotic disease units, or field epidemiology training programs. In this way, information from the scenario-based discussions can be aligned with the realities of the systems and capacities on the ground. For example, site visits can reveal the number of staff present within a facility on a given day, whether internet is available at a site on demand, or whether sufficient reagents are available within the laboratory to conduct tests at that time.

Key informant interviews with individuals who were not part of the scenario-based discussion can be important for validating data. As with the scenario-based discussion, the focus of the key informant interviews should be to explore the steps for prevention and management for the defined priority zoonotic diseases, with an emphasis on cross-sectoral/One Health coordination and communication. Key informant interviews can also be performed with the view of asking follow up questions to individuals who did participate in the scenario-based discussion, for example to clarify responses or add nuance. If the country has conducted the JEE external assessment it can be valuable to review the assessment report as well as the SPAR and any National Action Plan for Health Security (NAPHS) as supplemental data. Revisiting the literature can be another source of supplemental data, particularly with respect to clarifying discrepancies in group responses, or to check whether plans and procedures described as publicly available are indeed accessible via the indicated library or database.

Data collected during the site visits, key informant interviews, and supplemental data searches should be included as supplemental data in Appendix G. A template for the stakeholder interviews is available as Appendix I.

![Figure 5](https://via.placeholder.com/150)
**STEP 7: Creation of disease-specific systems maps**

Mapping of zoonoses and the burden of such diseases can help identify vulnerabilities not only where zoonoses pose significant health threats but also where efforts can be focused to improve prevention, communication, and coordination across veterinary and human health. Once the data set for each priority disease has been compiled using the scenario-based discussion, site-visits, stakeholder interviews and supplemental data the results can be compiled to produce disease-specific systems maps. Data collected in Appendix G should be consolidated and referenced in creating the maps. These disease-specific maps can identify the nodes of communication, coordination, and decision-making where the human and veterinary health sectors intersect, highlighting areas of strength as well as gaps that would benefit from capacity-building resources. This type of analysis may also identify current vertical, disease-specific strategies and frameworks that can be applied horizontally to develop national zoonotic disease strategies. An example of the structure of the final systems map is provided in Figure 6 and an editable version of this diagram is provided in PowerPoint format as Appendix J.

**PHASE III. Analysis and Recommendations**

The disease-specific systems maps created in Phase II can be used to conduct an analysis of the strengths and weaknesses of existing intersectoral coordination, and develop recommendations for actions to address the gaps. An example of the diagram is provided in Figure 7. The system maps can be used to analyze the strengths and weaknesses of existing intersectoral coordination, and develop recommendations for actions to address the gaps. Add columns if additional ministries or sectors are involved.
STEP 8: Gaps analysis of systems maps

The systems maps provide an opportunity to view the existing structures and systems in place for coordination and communication on priority zoonotic diseases, both between sectors (horizontal linkages) as well as between different administrative levels within sectors (vertical linkages). Individual disease maps should be reviewed to:

1) Reveal areas of existing coordination/communication between sectors, that can be highlighted as a best practice, advocated for sustained investment and potentially used to advocate for further One Health capacity building (nation-ally or regionally);

2) Identify areas where gaps in coordination/communication can be translated into recommendations for strengthening policies, protocols and/or practices for zoonotic disease preparedness and response across sectors.

It is important to note that disease maps do not need match in level of detail or number of connections between and across sectors. That is, it is not required to have strong linkages between every possible point in the system for each priority zoonoses. Instead, being able to compare the presence or absence of linkages across the different disease-specific maps can reveal opportunities for adapting capacities or processes that may be in place for one specific disease (developed, for example, via a vertical disease program) for other priority zoonotic diseases, or indeed for forming the basis of new system-wide, horizontal policies and practices. Whenever possible the group of stakeholders responsible for the selection of priority diseases and scenario-based discussion should be involved in the gap analysis.

STEP 9: Develop and validate recommended actions

The identified gaps can be used to develop recommended actions, and associated project ideas, to build new linkages and improve coordination and communication; aligning with national priorities and regional/international health frameworks (consider NAPHS). The identified recommendations can be disease-specific where relevant but most importantly they should be applicable at a systems level, to improve overall One Health coordination for zoonotic disease control (beyond the 5 priority zoonoses). Rather than be seen to promote stand-alone, vertical efforts, disease-specific recommendations can serve as a useful leverage point in acclimatizing high-level decision-makers to the One Health concept.

A complete list of the draft recommendations should be reviewed with focal points and/or key stakeholders for validation. The review should include specific considerations about the types of actions that will be needed to address the identified gap, which sectors/stakeholders will need to be involved, who (sector or department) is responsible, whether the action is a priority for the country, and the estimated timeline for its implementation. In this way, the draft recommendations can be used to develop preliminary project ideas, with full stakeholder input and endorsement, that are easily repackaged to provide to ministries, donors, implementing organizations, and other partners. The validation process can also serve as a preliminary dissemination of the assessment findings, and an opportunity to gather initial feedback.

A template to facilitate the development and validation of recommended actions is available as Appendix K.

STEP 10: Support appropriate dissemination of findings

It is critically important to ensure all findings, including policy and project recommendations, from the assessment are made accessible to the key ministerial partners. Usually, this will take the form of an assessment report, developed with the inputs gathered during the review of the recommendations and the development of the project ideas. Additional dissemination activities will need the approval of ministerial partners, but can include meetings/workshops at the sub-national level to share lessons learned and best practices, making the report publicly available, adapting it into a peer-review publication, or presenting the findings at national and international conferences.

EXPECTED OUTCOMES

The three phases and subsequent steps of the OHSAPZ methodology are designed to result in four main outputs:

1) A list of approximately five priority diseases, based on agreement between the human, animal, and environmental health sectors;

2) Systems “maps” for each identified priority zoonotic disease, representing the flow of case data, samples, patients, and other disease-related information between the levels of the health system within each sector, as well as between sectors;

3) A list of prioritized recommended actions to address observed gaps;

4) A final assessment report, which may include summaries of the outputs described above, and which should be delivered to the primary participating ministries (and other stakeholders, as deemed appropriate by the ministries).

This list of expected deliverables should be socialized with the participating ministries at the outset under Phase 1, Step 1, as anticipated benefits of the process. In some cases, the outputs can be directly applied towards efforts to achieve compliance with key international health security frameworks.

For example, identification of the five priority zoonotic diseases is directly in line with meeting obligations under the International Health Regulations (2005), as measured through the “Zoonotic Disease” technical area under the Joint External Evaluation tool, see Table 2.

More generally, the OHSAPZ process is designed to provide visibility into a country’s strengths and weaknesses with respect to cross-sectoral communication and coordination, while providing a clear pathway for addressing any identified gaps.

When performed the first time, the results of the assessment can furthermore be viewed as baseline data on One Health coordination for zoonotic diseases, using a reproducible methodology, against which to compare the progress of future One Health implementation efforts.
Table 2 Alignment of OHSAPZ and OHTAPZ with global health security framework indicators

<table>
<thead>
<tr>
<th>Key Assessment Components</th>
<th>SPAR (2nd edition) Capacities</th>
<th>JEE (3rd edition) Indicators</th>
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<td>OHSAPZ</td>
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<td>Human, animal, environmental health sector involvement</td>
<td>C12. Zoonotic Diseases (12.1)</td>
<td>P5. Zoonotic Diseases (5.1, 5.2)</td>
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<td>Jointly agreed list of national priority zoonoses</td>
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<td>Comprehensive systems mapping of national capabilities and gaps in information sharing and coordination</td>
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<tr>
<td>Analysis of strengths and weaknesses in intersectoral and bilateral networks for targeted One Health capacity building</td>
<td>C2. IHR coordination and National IHR Focal Point [2.2, 2.3]</td>
<td>P3. IHR Coordination, National IHR Focal Point Functions and Advocacy (1.2, 3.3)</td>
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<td>C4. Laboratory [4.1, 4.5]</td>
<td>P4. Antimicrobial Resistance (4.1)</td>
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<td>C5. Surveillance [5.1, 5.2]</td>
<td>P5. Zoonotic Diseases (5.1, 5.2, 5.3)</td>
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<td>Additional OHTAPZ components</td>
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<td>Human, animal, environmental health sector involvement and stakeholders with oversight of ground crossings</td>
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<td>Jointly agreed list of priority transboundary zoonotic diseases</td>
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<td>Comprehensive systems mapping of capabilities and gaps in information sharing and coordination bilaterally</td>
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<tr>
<td>Analysis of strengths and weaknesses in intersectoral and bilateral networks for targeted One Health capacity building at PoEs</td>
<td>All OHSAPZ capacities plus weaknesses in intersectoral and C21. Point of Entry and Border Health [Section 2, 11.1, 11.2, 11.3]</td>
<td>All OHSAPZ indicators plus PoE Points of Entry and Border Health (1, 2, 3)</td>
</tr>
</tbody>
</table>

REFERENCES

APPENDICES

A: Stakeholder Mapping
B: Literature Review and Data Collection
C: Selecting Qualifying Criteria for Disease Prioritization
D: Selecting National Priority Zoonotic Diseases
E: Event Scenario Development
F: Event Scenario PowerPoint
G: Scenario and Stakeholder Interview Note Taking
H: Disease Narrative Template
I: Stakeholder Interviews Template
J: Disease-Specific Systems Map Template
K: Recommended Actions Template