

Toward the Implementation of the One Health Approach in the Eastern Mediterranean Region

An Operational Guide



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List of Acronyms and Abbreviations

| | |
|--------------|--|
| AMR | Antimicrobial Resistance |
| BCC | Behavior Change Communication |
| CDC | Centers for Disease Control and Prevention |
| EMR | Eastern Mediterranean Region (<i>see also the 'Region' below</i>). Both the acronym 'EMR' and the word 'Region' are used throughout this document to refer to the countries in the Eastern Mediterranean Region. |
| FAO | Food and Agriculture Organization of the United Nations |
| FETP(s) | Field Epidemiology Training Program(s) |
| FETPV | Field Epidemiology Training Program for Veterinarians |
| GHD EMPHNET | Global Health Development The Eastern Mediterranean Public Health Network |
| JRA OT | Joint Risk Assessment Operational Tool |
| IHR | International Health Regulations |
| MoA | Ministry of Agriculture (as an abbreviation for the national ministry or agency/department responsible for agriculture and/or animal health) |
| MoH | Ministry of Health (as an abbreviation for the national ministry or agency/department responsible for public health) |
| OH | One Health |
| OH-SMART™ | One Health Systems Mapping and Analysis Resource Toolkit |
| OHHLEP | One Health High-Level Expert Panel |
| OHZDP | One Health Zoonotic Disease Prioritization (Tool) |
| OHSAPZ | One Health Systems Assessment for Priority Zoonoses (Tool) |
| OIE | World Organization for Animal Health |
| (the) Region | Eastern Mediterranean Region (<i>see also EMR above</i>). Both the word 'Region' and the acronym 'EMR' are used throughout this document to refer to the countries in the Eastern Mediterranean. |
| UNEP | United Nations Environment Programme |
| UKHSA | UK Health Security Agency |
| USDA | U.S. Department of Agriculture |
| DTRA-BTRP | Defense Threat Reduction Agency - Biological Threat Reduction Program |
| WHO | World Health Organization |

Introduction and Background

It is a recognized fact that the health of people is closely connected to the health of animals and their shared environment. The recent COVID-19 pandemic has once again reminded us of this deep interconnection given the spillover of SARS CoV2 from animal reservoir. This underscores the vital importance of the 'One Health' approach to mitigating the next pandemic more than ever before. Outbreaks of West Nile Virus (WNV), Ebola hemorrhagic fever, severe acute respiratory syndrome (SARS), Monkeypox, Bovine spongiform encephalopathy (BSE) or mad cow disease, Middle East Respiratory Syndrome Coronavirus (MERS-CoV), Nipah virus (NiV) infection, Japanese Encephalitis, Dengue fever, and Highly Pathogenic Avian Influenza (HPAI) were reminders of the same reality. Up to 75% of emerging infectious diseases (EIDs) that have the potential to infect and spread among humans are of animal origin [1]. Population growth and the associated increasing demands for food and water; deforestation, significant loss of biodiversity, the destructive impacts of climate change [2] with resulting heat, droughts, wildfires, floods, deforestation, rising temperatures; and globalization have caused a rapid conversion of natural ecological habitats into agricultural land. These changes push domestic animals, humans, wildlife, and their habitats into closer and more frequent contact, heightening the risk of infectious agents spread from wildlife to humans or domestic animals, and vice versa [3, 4]. One Health (OH) recognizes these interdependencies and promotes communication, collaboration, and coordination within and across disciplines and sectors to better understand and manage the associated risks [5].

The concept of One Health, as we presently know it, originated from 'One Medicine', a notion that is much older, and which emerged to promote collaboration between the human and veterinary medicine professions and the allied health/scientific disciplines [6]. We have been vividly talking about the need to adopt a One Health approach since the beginning of this century [7]. However, we still have a long road ahead of us when it comes to establishing and maintaining effective communication and coordination between human and veterinary medicine/public health, agronomy, ecological, social sciences and environmental science [8] plus actively involving relevant sectors to collaborate and work under the 'One Health' umbrella. On the positive side, now is the time to consider One Health, beyond any doubt, as a paradigm shift and a holistic approach that will lead to a wider and deeper commitment to transdisciplinary, multisectoral action addressing public health challenges and the protection and needs of society in the 21st Century' [9]. Also, OH has been suggested to be added as a pillar for a transformative pandemic treaty. This will be an opportunity for accelerating the OH infrastructure and move from rhetoric to action [5].

Humans and animals cannot live in their own separate worlds. Although they may have different environments, on many occasions, they share the exact same environment. They depend on each other for their very co-existence, and they affect each other bidirectionally, in both positive and negative manners. The health of

humans, domestic and wild animals, plants, and the wider environment (including ecosystems) are closely linked and interdependent [10–12]. As an example of this interconnection, the health of wildlife is increasingly impacted by the growing environmental footprint of the human populations represented by the urbanization and deforestation activities. That, in turn, backlashes at humans' health by posing large-scale health security threats. If human actions result in climate change or negatively affect or endanger wildlife conservation, biodiversity, and environmental stability, then the health of humans will directly be threatened or even affected in a devastating manner. This will pose a health security threat to the whole planet. Recent pandemics and epidemics are obvious examples.

Such interconnectedness necessitates the 'One Health' approach, which is necessary to effectively address disease emergence as well as other complex problems such as antimicrobial resistance, sustainable food production, food security and safety, biodiversity loss, maintenance of healthy water ecosystems, and the consequences of climate change [13]. One Health approach is also important in advancing global health security (GHS) and the Sustainable Development Goals (SDGs) [14]. One Health is a collaborative, multisectoral, and transdisciplinary approach—that needs to function at the local, regional, national, and global levels—to achieve optimal health outcomes recognizing the interconnection between people, animals, plants, and their shared environment [15].

Appreciating the complex and transdisciplinary nature of the interface of human, animal, and ecosystem health, the Food and Agriculture Organization (FAO), the World Organization for Animal Health (OIE), the World Health Organization (WHO) (or The Tripartite Collaboration) and more recently the United Nations Environment Program (UNEP) (collectively the Quadripartite since March 2022) established the One Health High-Level Expert Panel (OHHLEP) on 20 May 2021 [16], an advisory panel whose members represent a broad range of disciplines in science and policy-related sectors relevant to One Health from around the world. Working on a definition of One Health that mainstreams the concept with the aim of better prevention, prediction, detection, and response to global health threats and promoting sustainable development, the OHHLEP elaborated a new operational definition in December 2021 that states: "One Health is an integrated, unifying approach that aims to sustainably balance and optimize the health of people, animals, and ecosystems. The approach mobilizes multiple sectors, disciplines, and communities at varying levels of society to work together to foster well-being and tackle threats to health and ecosystems, while addressing the collective need for clean water, energy and air, safe and nutritious food, taking action on climate change, and contributing to sustainable development." [10–12].

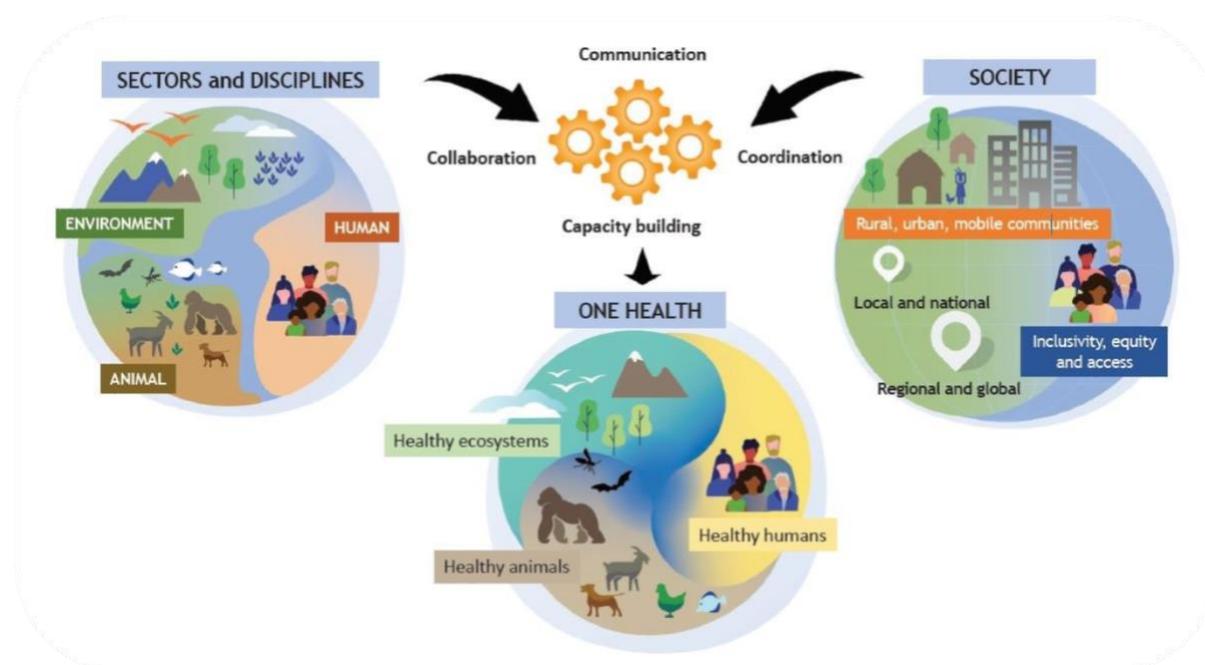


Figure 1. Sectors/Discipline, Society, and One Health.
Source: FAO, OIE, WHO, & UNEP

The importance of this new operational definition lies in linking humans, animals, plants, and the environment in a manner that helps to address the full spectrum of disease control—from disease prevention to detection, preparedness, response, and management—and to improve and promote health and sustainability, as illustrated in Figure 1 (above) from the same sources [10–12]. The One Health approach, as recently defined, makes it easier for people to better understand the co-benefits, risks, trade-offs, and opportunities to advance equitable and holistic solutions. The concept emphasizes that, while health, food, water, energy, and environment are all wider topics with sector-specific and specialist concerns, the collaboration across sectors and disciplines will contribute to protecting health, addressing health challenges such as the emergence of infectious diseases and antimicrobial resistance (AMR) and promoting health and integrity of our ecosystems. The One Health approach can be applied at community, sub-national, national, regional, and global levels, and relies on shared and effective governance, communication, collaboration, and coordination [10–12].

Purpose and Objectives

The main purpose behind this regional One Health operationalization initiative is to serve as a transformative mechanism in the Eastern Mediterranean Region to improve the health of humans, animals, and the environment they share through One Health governance and policy, multisectoral involvement, liaison, communication, collaboration, coordination, research, and capacity building.

To reach the mentioned aim, support will be provided to the countries in the Region through coordination and collaboration with different regional and global One-Health stakeholders alongside five operational directions, which also serve as five action-oriented objectives. These are rather broader objectives which are elaborated later in this document in the section on the Operationalization of the One Health approach in the Region:

1. To establish and strengthen a governance architecture, legal framework, and policy and advocacy structure for One Health Operationalization in the Region.
2. To foster coordination, communication, and collaboration for One Health actions across the Region and beyond.
3. To build the capacity for effective One Health operationalization in the Region.
4. To support regional platforms for timely, effective, and efficient, data sharing and exchange on all One Health-related issues.
5. To ensure risk communication, behavior change communication (BCC), and active community engagement using the One Health approach.

GHD|EMPHNET's capacity to support One Health in the Region

The following capacities/capabilities put GHD|EMPHNET in a special position to support effective OH operationalization in the Region: its technical capacity, organizational capacity, and regional coordination/networking capability in addition to its rich technical background with multiple specialties since its establishment as a regional network. A summary of these capacities/capabilities are visualized in Figure 2 below.

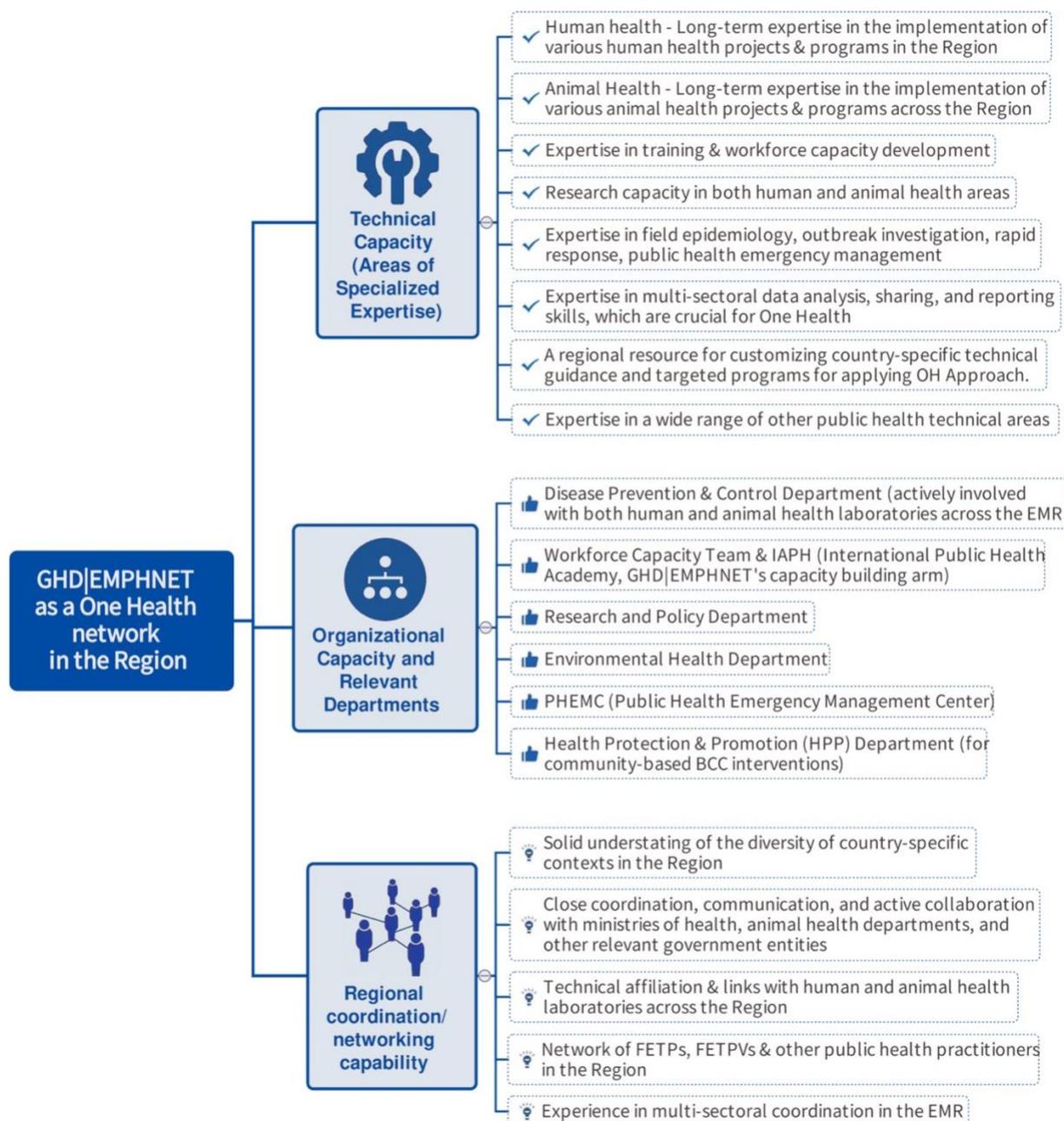


Figure 2. GHD|EMPHNET's OH Support Capacity

GHD|EMPHNET is in a unique position to function as a reliable One Health network in the Region because of its expertise in a wide range of technical areas related to human and animal health, its solid understating of the diversity of country-specific contexts in the Region, its close coordination, communication, and active collaboration with ministries of health—and through them—with other relevant government entities (including human and veterinary laboratories and animal health departments), its network of field epidemiologists (FETPs as well as FETPVs) and other public health practitioners in the Region, and its years of work experience in implementing various public health programs in the Eastern Mediterranean Region. Our Disease Prevention and Control Team is functional in countries of the Region in both human and animal health sectors. Our areas of involvement include, among others, laboratory-based surveillance for brucellosis, anthrax, and laboratory biosafety/biosecurity interventions in different countries. GHD|EMPHNET is also actively collaborating with animal and human health laboratory networks across the Region. Our Health Protection and Promotion Department, through its various community-based public health programs in the countries, has close and deep links within those communities. Such links can be utilized to play pivotal role towards active community participation, a positive behavior change among communities towards One Health at local, subnational, and national levels, and communities' active engagement with line sectors for enhanced coordination, communication, and collaboration. On the other hand, GHD|EMPHNET has specialized expertise in workforce capacity building. Its capacity development arm, the International Academy of Public Health (IAPH), put this regional institution at a strategic position to ensure that the capacity of sectors and disciplines is consistently built within the Region in a manner that actively promotes coordination, communication, and collaboration among those various sectors. The environmental health program at GHD|EMPHNET complements preventive and disease control strategies at the interface of human, animal, and the environment through building capacity on identifying, monitoring, and responding to priority environmental risk factors. Thus, GHD|EMPHNET can provide technical support in a variety of modalities to the implementation of wide-scale interventions and play its role and effectively contribute to mainstreaming and operationalizing the One Health approach at regional, national, and subnational levels in the EMR countries where it functions. GHD|EMPHNET can technically support the establishment and achievement of national targets and priorities for various One Health interventions; support the promotion of community-based approaches, resource mobilization, collaboration, learning, and exchange across the sectors in the Region in the countries where it is physically and/or technically present.

Linking the Eastern Mediterranean Region to the Global One Health Efforts

No single intervention will prevent such complex problems as pathogen spillovers [4] and pandemic emergence. Any preventive measures in such contexts will only be complementary to the other needed measures. Recognizing that any approach

towards One Health must entail all required measures that can lead to high-end results/impacts, GHD|EMPHNET will play its role in bridging and bringing together relevant sectors to contribute effectively to a holistic approach across the Region. Communication, collaboration, and coordination at regional level are important functions which require the existence of a regional coordination body, a role that can effectively be played by GHD|EMPHNET. We will coordinate and collaborate with environmental protection agencies across the EMR countries in addition to the human and animal health sectors. Gradually, these communication, collaboration, and coordination efforts will be expanded beyond the Region to link with the global One Health efforts.

In order to ensure such coordination and collaboration, GHD|EMPHNET plans to establish the Regional One Health (OH) Committee for the EMR. This Committee will assume two main roles (dual functions) for the Region.

1. To ensure effective al communication and coordination, the Committee will primarily act as a *liaison* between the countries in the Region and relevant global entities involved in the One Health efforts. Under this function:
 - a. The Committee will liaise between the countries and the Quadripartite Alliance, US-CDC, USDA, DTRA-BTRP, UKHSA, and other relevant global partners.
 - b. The Committee will closely follow any technical updates by OHHLEP and other global entities to keep the countries in the Region abreast of global OH updates for the purpose of their operationalization at regional level.
 - c. The Committee will liaise with regional and international OH knowledge and evidence networks/nexuses, e.g., FAO's Nexus for One Health.
 - d. The Regional One Health Committee will also communicate any concerns of the countries in the Region with OHHLEP and other global entities for their reflection at global level while seeking pragmatic solutions to such concerns.
2. To ensure effective regional collaboration and capacity development, the Committee will function as a *technical advisory, support, and oversight body* across the Region to facilitate the One Health Quadripartite work in the Region and ensure that all stakeholders across the EMR are actively engaged/involved in the One Health response. Under this function:
 - a. GHD|EMPHNET will support the development of and strengthen the in-country OH governance system, including in-country One Health Networks (or OH Teams consisting of line government ministries/departments—e.g., Ministries of Health (MOH), Ministries of Agriculture, (MOA), Environment Protection Agencies, and other relevant ministries/ departments—that are linked with the Regional OH Committee.

- b. Formulate and mainstream One Health at regional to national, subnational and community levels.
- c. Provide training and capacity building opportunities on One Health initiative.
- d. Develop One Health capacity building, coordination, and communication plans at country level.
- e. Advocate for OH in the EMR countries where GHD|EMPHNET is technically and/or physically present.

These roles are visualized in Figure 3 below.

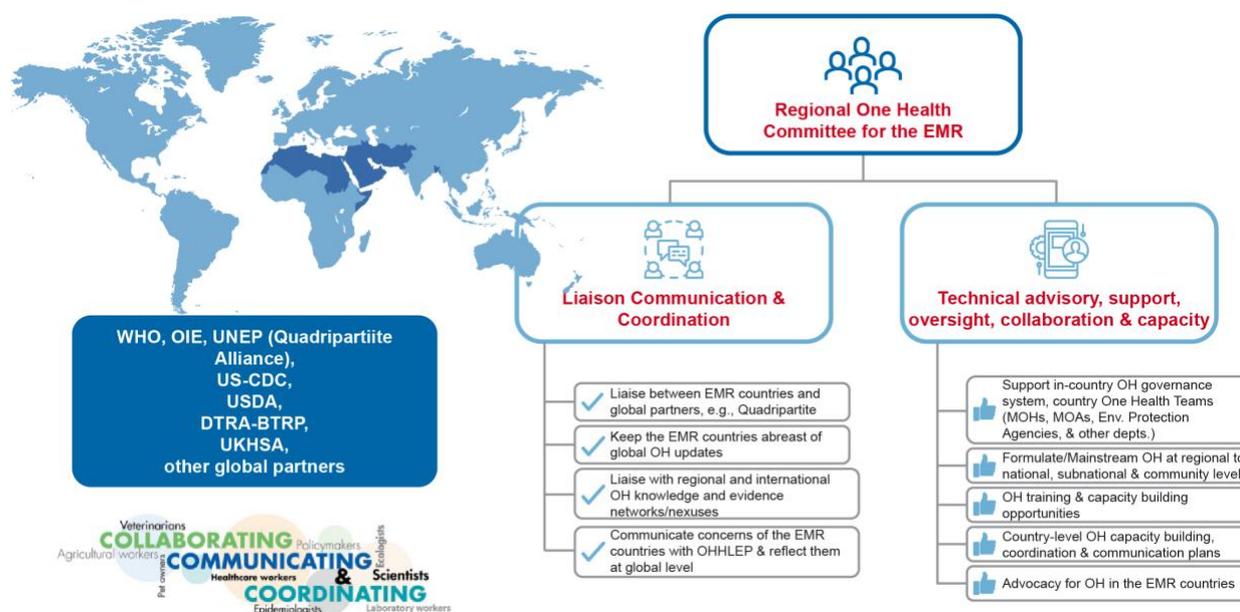


Figure 3. Regional One Health Committee Roles/Functions

In other words, the Regional One Health Committee will carry out a dual set of main functions by serving as a bridge between human, animals, and environment sectors in the EMR countries *and* ensuring that technical support is available for the operationalization of OH among the involved sectors in those countries.

Operationalization of the One Health approach in the Region

In addition to functioning as a regional liaison/coordination and technical advisory, support, and oversight body, GHD|EMPHNET will provide necessary support for implementing One Health in the Region. While evidence suggests that the associated costs of pandemic preventive efforts are substantially less than the economic and mortality costs of responding to pathogen spillovers after pandemics emerge [17], a recent review has quantified such preventive measures to cost less than 1/20th of the value of lives lost each year to emerging viral zoonoses while having substantial co-

benefits [18]. Thus, the best ways to address and minimize the impact of future pandemics entail “detecting and containing emerging zoonotic threats at the source” [19] and preventing the root cause of spillover. As a regional network, GHD|EMPHNET will contribute to primary pandemic prevention actions in the Eastern Mediterranean Region (EMR) by enhancing the surveillance of pathogen spillovers during the pre-emergence and localized emergence stages of a potential pandemic [20]. Such active involvement will also require and allow our affiliate laboratories in the Region to contribute to the development of global databases of virus genomics and serology. GHD|EMPHNET can play a pivotal role in strengthening primary preventive measures across the Region through its expertise in behavior change communication (BCC). Some examples of how we can effectively bring change at impact scale include the development of precisely designed BCC messages and material about critical yet overlooked One Health related issues. Such materials need to be carefully adapted/tailored to various intended audience needs. They must also establish clear and easily comprehended links between improved public health and well-being and other elements of the human-animal-environment triad such as prevention/reduction of deforestation, advocating for better management of wildlife trade (as available evidence recommend [18]), and other issues that impact the environment/shared ecosystem in the Region. The BCC measures will include a wide range of interventions and will cover different target segments, from the public all the way to policy makers.

Regional Operationalization of the One Health Approach



Figure 4. Operationalization of the One Health Approach in the EMR

Operationalization of the One Health approach is visualized in Figure 4 (above), and it will be supported through the following five action-oriented objectives:

1. Establish and strengthen a governance architecture, legal framework, and policy and advocacy structure for One Health Operationalization in the Region.

A. Support countries in the Region to establish or enhance their legal frameworks and governance structures for the country-level One Health programs and country-level OH Committees.



- Support the monitoring (including the development of metrics for measuring) and assessment of OH capacity and pandemic preparedness within the regional governance structure through the adoption of an inter-/ transdisciplinary OH evaluation framework and methodology and linking it with the current global OH governance, monitoring, and/or data sharing structures. The Network for Evaluation of One Health (NEOH) (<https://neoh.onehealthglobal.net/>) has established a framework for evaluating One health surveillance and programs [21].
- Provide technical and scientific support to the review and management of evolving policy issues in the countries.

B. Work towards the integration and mainstreaming of OH into regional and national policies in the EMR and the countries where GHD|EMPHNET has a functional and/or physical presence. This will also include:

- Integration of line ministries, technical bodies, and government entities in the response to zoonosis
- Provide recommendations that influence national policies in the EMR countries.
- Support the development and/or enhancement of national One Health strategic plans. Some countries already have One Health national strategic plans
https://www.onehealthcommission.org/en/resources_services/one_health_strategic_action_plans.

C. Actively advocate for resource mobilization working with development agencies and resource partners to advance One Health in the Region and support One Health to address health security threats in the Region

- Advocate for OH to be fully integrated and mainstreamed in the funding structure for any outbreaks or potential threats prevention, preparedness, and response in the Region.

- Support writing strategic proposals on One Health at the regional level
- Support countries in writing scientific/research papers and their own OH proposals

D. Develop a Framework for Evaluation and Review of the implementation of the regional operationalization plan that ensures resources to carry it out are included in all budgets, so that progress can be measured, successes celebrated, and improvements and adjustments can be made. Incorporate a review timetable such that minor reviews occur biennially and a major review each six years.

2. Foster coordination, communication, and collaboration for One Health actions across the Region and beyond.

A. Support the development and strengthening of multi-sectoral coordination mechanisms at national levels in the Region.

B. Engage key partners to understand the regional OH issues and respond



- When these partners work together, we are going to be able to study diseases and formulate prevention measures more easily and efficiently than if they all try to tackle these issues separately
- Enhance cooperation between human and animal health and environmental professionals.
- Communicate regional OH issues and goals with political leaders.
- Support countries to identify and address Inter-ministerial issues to get to One Health.

C. Foster public-private partnership (PPP) in One Health-related matters in the countries across the Region.

3. Build the capacity for effective One Health operationalization in the Region.

A. Build regional capacity on primary pandemic prevention, timely detection, and control of zoonotic diseases, vector-borne diseases, neglected tropical diseases (NTDs), and food safety hazards; systematic information sharing between the human and animal health sectors, help stakeholders detect and respond to zoonotic diseases rapidly, as well as enhance capacity on AMR and biosafety and biosecurity

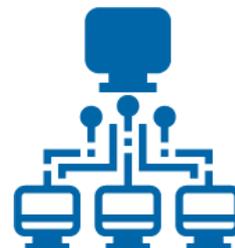


- B. Support the establishment of new FETPVs in the Region. We are currently supporting Bangladesh FETPV.
- C. Support multi-sectoral prevention, preparedness, and response planning:
- Support the development and implementation of National AMR Action Plans.
 - Support context-/country-specific areas for addressing zoonoses/ emerging and re-emerging infectious diseases, e.g., developing Brucellosis, zoonotic TB, vector-borne diseases (VBD), tick-borne diseases, NTDs, and National Rabies Control Planning to meet ZERO by 30 goal [22], food insecurity, etc.
- D. Support the development of a functional capacity across EMR to implement/ operationalize the new/comprehensive One Health understanding in the Region:
- Support in-country multi-sectoral workforce development and planning: in-country reviews and prioritization of national and sub-national workforce needs to inform One Health education and training
 - Participate and/or provide training and technical support on the Joint Risk Assessment Operational Tool (JRA OT)
 - Support the conduction of in-country training efforts on The One Health Systems Mapping and Analysis Resource Toolkit (OH-SMART™) for operationalizing One Health.
 - Utilizing OH-SMART™ (or other means subject to discussion), establish and map an inventory of the programs and projects at the regional level that exist or focus on One Health, extract best practices, and build on them across the Region.
 - Supporting/conducting One Health workshop(s) in the Region that calls for joint operational/ action plans for the participating countries. These plans will focus on regional cross-border/ transnational communication, coordination, and integration capacity to manage outbreaks, seek shared opportunities, and address common challenges among countries.
 - Identify obstacles/challenges and explore opportunities in the operationalization and implementation of the One Health concept across the Region
 - Take steps towards the operationalization of the recently proposed comprehensive definition of One Health across EMR.
 - Promote and strengthen research capacity in One Health.

- E. Building One Health Workforce (as already pointed out in the background about IAPH as GHD|EMPHNET's workforce capacity development arm): Develop nine-month and three-month CPD curricula and training programs focusing on One Health plus involving human, animal, and environmental health sectors to combat zoonotic diseases through their capacity development:
- One Health Program (Nine months)
 - PHEP (Public Health Empowerment Program)-One Health (Three months)
 - Short online courses (5 hours)
 - Antimicrobial resistance AMR from a One Health perspective (considering human, animal, and environmental sources) as well as building capacity for qualified laboratories on advanced molecular detection and whole-genome sequencing (WGS) and plasmids sequencing to go with laboratory-based surveillance projects for viral and bacterial diseases under the umbrella of One Health, capacity development support to tricycle programs in the countries. This implies seeking active opportunities to work with Fleming Fund to build AMR capacity in the Region.
 - Other areas may include epizootics, zoonoses, and how they pose us to the risk of pandemics, vector-borne diseases; ecotoxicology, environmental health and safety, the development of chronic and multifactorial diseases linked to environmental pollution; evolution and emergence/ re-emergence of pathogens, certain human activities, lifestyles, and behaviors and their effect on the ecosystems; food safety and security, mental health, and occupational health.
 - Zoonotic disease prioritization for targeted One Health interventions: support CDC efforts in the Region by building capacity on the One Health Zoonotic Disease Prioritization (OHZDP) Tool [23] and One Health Systems Assessment for Priority Zoonoses (OHSAPZ) Tool [24].
- F. GHD|EMPHNET has already established a Curriculum Working Group (CWG) to work on a One Health Curriculum to target a carefully selected segment of FETPs and other public health and veterinary providers in the Region. As needed, the CWG will work with TEPHINET and other partner for building global capacity in OH. Over time, this working group will evolve into the Regional One Health Committee with a wider technical scope.

4. Support regional platforms for timely, effective, and efficient, data sharing and exchange on all One Health-related issues.

- A. Establish a cross-platform/mechanism network for the Region to share data on wildlife diseases surveillance and trade because inadequate surveillance and monitoring of wildlife trade enable zoonotic disease emergence. The network will have a presence at the country level with accessibility to grassroots levels.
- B. Work on real-time surveillance, laboratory-based surveillance, and early warning systems with a focus on One Health, including:
- C. Efforts to establish a regional One-Health surveillance system that is linked to the global surveillance system for One Health.
- D. Provision of technical support to regular surveillance of wildlife populations for disease to the relevant entities in the countries where GHD|EMPHNET function.
- E. Provide IT & Innovative Solutions in the Region by establishing an interface within the Region to connect and share information including surveillance data—on infectious pathogens in wildlife, companion animals, livestock, humans, and the environment (i.e. soil and water), as well as on risk factors for disease emergence)—among all relevant sectors to help see the dynamics behind the zoonotic diseases spread, support the implementation of management measures, and enhance a multi-sector communication, coordination, and collaboration for active response in partnership with international organizations.



5. Support risk communication, behavior change communication (BCC), and community engagement efforts in the Region:

- A. Help countries design effective awareness campaigns & workshops for different groups/local communities and educate the public sector
- B. Support countries to raise community awareness through BCC interventions about the risks and consequences of climate change, with resulting heat, droughts, wildfires, floods, and rising temperatures, the destructive impacts of deforestation, loss of biodiversity, disease emergence, and other complex issues such as antimicrobial resistance, food security and safety, maintenance of healthy water ecosystems, the consequences of rapid conversion of natural habitats into agricultural land with subsequent push of domestic animals, humans, wildlife, and their habitats into closer and more frequent contact, heightening the risk of infectious agents



spread from wildlife to humans or domestic animals, and vice versa, and the need for advancing global health security.

- C. Support risk communication through offering solutions that—while fit within the holistic picture—are practical and capable of driving action at grassroot levels (i.e., at the level of local communities and neighborhoods). The developed plans must have ongoing series of community education sessions consequent to their awareness raising. These plans must be tailored to local custom and needs in coordination with local community leaders as well as formal government players, to identify the local concerns and needs and to focus on planning local responses that include what communities have capacity to do for themselves and where they need additional support from outside (district, sub-national, and national levels).
- D. Support mitigation efforts for One Health-related risks in the countries through awareness generation among local communities.

Regional and Global Partners:

Potential regional and global partners for the operationalization of OH in the Eastern Mediterranean Region include:

- Ministries/Departments of Agriculture/Livestock/Wildlife in the relevant countries,
- Ministries/Departments of Health in countries,
- Environment protection agencies in the countries,
- World Health Organization (WHO),
- World Organization for Animal Health (OIE),
- Food and Agriculture Organization (FAO),
- UN Environment Program (UNEP),
- One Health High-Level Expert Panel (OHHLEP),
- Centers for Disease Control and Prevention (CDC),
- US Agency For International Development (USAID),
- The Fleming Fund (for action against antimicrobial resistance),
- Defense Threat Reduction Agency (DTRA-BTRP),
- European Centre for Disease Prevention and Control (ECDC),
- Global Health Centre, Graduate Institute of International and Development Studies, Geneva,
- Ministries of higher education in the countries,
- Ministries of education in the countries,
- Academia across the Region and beyond,
- One Health networks and associations,
- Regional and international networks, such as epidemiology networks, and
- Other collaborators and funding agencies.

Next Steps:

The next step towards regional operationalization of One health is to work with the countries and relevant One-Health stakeholders, using this roadmap, to create operational workplans for the countries within and overall operational framework for the Region.

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Additional Resources:

The list below summarizes additional technical resources on One Health-related topics. This list will be updated as new resources are identified and/or updated versions of currently listed resources are made available. The items in this list are ordered chronologically (the most recent on top). The exception to this order is all

webpages which have no specific dates on them. Thus, they are marked as “-n.d.” (no date) and are placed at the bottom of this list. Structured training courses on public health during mass gatherings are highlighted **in bold**.

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GHD|EMPHNET: Working Together for Better Health

The Eastern Mediterranean Public Health Network (EMPHNET) is a regional network that focuses on strengthening public health systems in the Eastern Mediterranean Region (EMR) and beyond. EMPHNET works in partnership with ministries of health, non-government organizations, international agencies, private sector, and relevant institutions from the region and the globe to promote public health and applied epidemiology. To advance the work of EMPHNET, Global Health Development (GHD) was initiated to build coordination mechanisms with partners and collaborators. Together, GHD|EMPHNET is dedicated to serving the region by supporting efforts to promote public health policies, strategic planning, sustainable financing, resource mobilization, public health programs, and other related areas.