ONE HEALTH HIGH-LEVEL EXPERT PANEL

ANNUAL REPORT 2021

Food and Agriculture Organization of the United Nations
WORLD ORGANISATION FOR ANIMAL HEALTH
UN environment programme
World Health Organization

CONTENTS

FOREWORD FROM THE PARTNERS

The COVID-19 pandemic once again exposed key gaps in our knowledge on how diseases that spillover from animals to humans (zoonotic diseases) can emerge and re-emerge with devastating impacts across all sectors. The pandemic emphasised the need for enhanced coordination and collaboration among sectors and agencies, nationally and internationally to better prevent, prepare for, and respond to these threats. Responding to this need, in November 2020 at the Paris Peace Forum, the Ministerial Meeting of the Alliance for Multilateralism called on the Tripartite (FAO, OIE and WHO) and UNEP (hereafter referred to as 'the Partners') to create a One Health High-Level Expert Panel (OHHLEP). Subsequently, at the 27th Tripartite Executive Annual Meeting in February 2021, the Partners agreed to establish OHHLEP to assist in their support to countries in the framework of their One Health collaboration.

With the support of the Governments of France and Germany, OHHLEP was launched in May 2021, after a thorough selection process which lead to the appointment of 26 diverse international experts representing a broad range of disciplines and policy-related sectors relevant to One Health. The Partners welcome the first OHHLEP annual report, which documents the work of the Panel over their first 10 months of operation, including the first key OHHLEP product, a comprehensive working definition of One Health.

The Partners are committed to using the knowledge generated by OHHLEP, including the analysis of scientific evidence on the **drivers contributing to spillover and subsequent spread of zoonotic diseases, and the development of a risk management framework**, a OH **Theory of Change** (ToC) to move One Health from concept to practice , and the proposal for an **optimized One Health surveillance system**, which they will in turn use to improve systems to better prevent, predict, detect, and respond to global health threats at all levels. The Partners take this opportunity to thank OHHLEP experts for their continued hard work and support, particularly with respect to provision of evidence-based scientific and policy advice to address the challenges raised at the animal-human-environment interface using the One Health approach. The Partners also thank OHHLEP members for their support to the development of the Tripartite and UNEP One Health Joint Plan of Action, that will align and advance our common goals to strengthen the One Health approach.

PARTNER FOCAL POINTS

FAO: Keith Sumption; Barbara Haesler

OIE: Jean Philippe Dop; Chadia Wannous; Tianna Brand

UNEP: Doreen Robinson; Julian Blanc

WHO: Peter Ben Embarek; Francesco Branca; Danny Sheath

FOREWORD FROM THE CO-CHAIRS

The One Health High Level Expert Panel (OHHLEP) convened for the first time on May 17, 2021. Out of over 700 applications from all over the world, the four international Partners, the Food and Agriculture Organization (FAO), the World Animal Health Organization (OIE), the United Nations Environment Programme (UNEP), and the World Health Organization (WHO), selected 26 experts from 24 countries as members of the OHHLEP. The expertise present in OHHLEP is wide ranging from infectious disease to biodiversity to social science. The Panel was conceived following a proposal of the French and German governments at the Paris Peace Forum in November 2020. It drew on the tripartite intersectoral cooperation between WHO, OIE and FAO on One Health issues. In 2021, UNEP joined to form the Tripartite plus UNEP which now acts as the umbrella for OHHLEP. It is the first time that a global panel on One Health has been created by the Partners as a centre for expert advice.

The terms of reference specify that OHHLEP will "initially focus on: 1) providing policy relevant scientific assessment on the emergence of health crises arising from the human-animal-ecosystem interface, and research gaps; and 2) guidance on development of a long term strategic approach to reducing risk of zoonotic pandemics, with an associated monitoring and early warning framework, and the synergies needed to institutionalize and implement the One Health approach, including in areas that drive pandemic risk". Following this mission, in its inaugural session, OHHLEP established four working groups concentrating on four topics: One Health implementation, a One Health research and initiatives inventory, One Health surveillance and One Health risk analysis. Working groups met frequently, initially biweekly. There were four full Panel meetings in 2021.

OHHLEP's first deliverable was a novel and expanded definition of One Health, which was supported by the four Partners was publicized and received acclaim. OHHLEP also provided critical input into the ongoing development of the One Health Joint Plan of Action, a strategic document outlining the way forward for the Partners' successful implementation of the One Health approach to tackle global problems at the human-animal-ecosystem interface. This also aligns with key needs to achieve the sustainable development goals, and as guiding principles for policy makers and scientists alike.

In this first half year, OHHLEP found its place in the plethora of One Health and other initiatives, programmes and projects that were established in and around the COVID-19 pandemic situation. There is a window of opportunity to implement novel strategies to better prevent and cope with global crises events arising from the human-animal-ecosystem interface. OHHLEP is well placed to give scientific advice to the four Partner organizations and beyond.

Wanda Markotter and Thomas Mettenleiter

INTRO-DUCTION

INTRODUCTION

This report summarizes the activities and results achieved in 2021 by the 26 experts of the One Health High Level Expert Panel (OHHLEP) (See Annex 1), according to the work plan agreed at the first OHHLEP meeting in May 2021. The report highlights main outputs and deliverables produced over the period and outlines priorities for 2022. The Panel is multidisciplinary, with experts who have a range of technical knowledge, skills, and experience relevant to One Health, and are drawn from all regions of the world. The expertise of OHHLEP includes and is not limited to:

- emerging infectious diseases and zoonoses.
- viral diversity, surveillance and risk assessment for emerging pandemic threats.
- infectious disease epidemiology, prevention and control.
- biodiversity, wildlife and ecosystems health.
- health systems policy and practice and pandemic preparedness.
- food systems and their interlinkages with health.
- social, economic and behavioural sciences relating to One Health.
- disciplines in informatics, modelling, prediction and foresight relevant to assessing impacts of environmental and other changes on emerging diseases and health.
- climate and environment.

TERMS OF REFERENCE

The Terms of Reference for OHHLEP were jointly developed by the four Partners (FAO, OIE, UNEP and WHO).

OHHLEP has an advisory role to the Partners and is expected to support their provision of evidence-based scientific and policy advice on One Health-related matters that support improved cooperation amongst governments to address the challenges raised by One Health.

The areas of focus of the OHHLEP will be subject to regular review by the Partners. Initially, the OHHLEP will focus on:

- providing policy relevant scientific assessment on the emergence of health crises arising from the human-animal-ecosystem interface, as well as research gaps; and
- guidance on development of a long-term strategic approach to reducing the risk of zoonotic pandemics, with an associated monitoring and early warning framework, and the synergies needed to institutionalize and implement the One Health approach, including in areas that drive pandemic risk.

Specifically, OHHLEP will perform the following functions:

- provide advice on the analysis of scientific evidence on the links between human, animal and ecosystem health, and contribute to foresight on emerging threats to health.
- provide advice on better understanding of the impacts of food systems (including agriculture, livestock farming and trade, wildlife hunting and trade, aquaculture, animal products.
- processing, handling, distribution and consumer practices) and ecological and environmental factors that may be contributing to zoonotic disease emergence/re-emergence and spillover events.
- contribute to the One Health research agenda setting and propose, advise on and review approaches and specific studies relevant to the development of a global approach to reduce risk of zoonotic pandemics.
- provide advice by invitation on One Health policy response in relevant member countries.
- provide recommendations on specific issues identified by the Partners in the areas of highest concern for attention and action, and future directions, in One Health.

INCEPTION AND WORK PLANNING

The OHHLEP was convened virtually by the four Partners for its inception meeting in May 2021 and supported by a Secretariat that includes representation from the Partners. WHO hosts the secretariat for the period 2021 to 2024, with this role rotating among the other Partners in future years.

The Secretariat supports the convening of the meetings, publication of meeting minutes and official OHHLEP reports via the OHHLEP website hosted by WHO. The Secretariat also provides research support and responds to other tasks required by the OHHLEP. The Secretariat also supports the virtual platforms to enable the OHHLEP to function and ensures the dissemination of the technical work of OHHLEP through relevant mechanisms including web sites of the four organisations, social media, media products, the development of educational or informational material, and technical or scientific publications. Following an initial launch period under the coordinating leadership of Dr Francesco Branca, Dr. Peter Ben Embarek, Head, WHO One Health Initiative (OHI) was identified by WHO as the secretariat focal point.

At the inception meeting, Prof Thomas Mettenleiter and Prof Wanda Markotter were nominated as OHHLEP Co-Chairs and Dr Dominique Charron was nominated Rapporteur. Reports of OHHLEP's meetings are available on the website (https://www.who.int/groups/one-health-high-level-expert-panel/members) hosted by WHO. Links to reports from the four OHHLEP meetings held in 2021 are provided in annex to this report.

WORKPLAN

OHHLEP's initial meeting identified key areas of knowledge that would be essential to respond to the OHHLEP Terms of Reference and support implementation of One Health by the Partners. A first priority was set on developing a common definition and theory of change that would enable OHHLEP to speak with one voice, and to support the implementation of the concept by the Partners and their member countries.

OHHLEP also identified critical knowledge gaps on:

- the state of One Health implementation around the world.
- the lack of comprehensive databases and resources to support One Health implementation.
- a need for mapping of existing initiatives, examples of success, and capacities for One Health research and implementation (One Health Workforce).
- the need for a model for an integrated One Health surveillance system and understanding of successful examples of existing One Health surveillance systems; consideration for how such a system could be used to detect previously unknown zoonotic diseases of public health importance.
- a more comprehensive understanding of the drivers of spillover of zoonotic diseases, and a standardized approach for assessing risks of spillover of pathogens between different animal populations and humans, and emergence of zoonotic diseases, including those arising in food systems.
- methodologies for identification and control of spillover risks and spread of zoonotic diseases.

OHHLEP organised four working groups to implement the work plan. Co-leads from among the OHHLEP members were named for each working group. OHHLEP started off at a brisk pace, with full OHHLEP meetings every 8-10 weeks (four meetings in 2021), and working group meetings every 2-3 weeks, with the OHHLEP Co-Chairs providing continuity between the working groups. The schedule of meetings and minutes is provided in Annex 2.

The initial work plan is summarized below. Elements that were the initial focus of OHHLEP's work are highlighted in blue.

1. ONE HEALTH IMPLEMENTATION

- **Defining One Health in the context of the Panel**
- **Develop a theory of change to make One Health go from a theoretical concept to the daily practice of collaborative work between the different sectors (health, agriculture, environment) and at different levels.**

- **Identify technical and institutional barriers for implementation of One Health on the ground**

- Identifying case studies demonstrating good practice in One Health in detecting, controlling and preventing emerging zoonoses. Specifically, what worked, how were barriers overcome, governance arrangements, funding, incentives, etc.

- Suggest/develop improved flexible implementation strategies for One Health, focusing on preventing emerging zoonoses in different contexts.

2. INVENTORY OF CURRENT KNOWLEDGE IN PREVENTING EMERGING ZOONOSES

- **Systematic review and inventory of useful documents, knowledge-sharing platforms, capacity building tools, projects, networks, committees and good practices for the use of One Health approaches in the prevention of emerging zoonoses**

- Identify successful transnational and national strategies and/or ministerial/administrative set-up that have shown practical and useful intersectoral collaboration (examples of good practice)

- Review requirements for a One Health workforce

- Develop and prioritize a portfolio of issues that would make a difference in the prevention of emerging zoonoses at the global, regional and national level

3. DEVELOP A ONE HEALTH FRAMEWORK FOR SURVEILLANCE, EARLY DETECTION, AND RAPID DATA SHARING IN THE PREVENTION OF EMERGING ZOONOSES

- **Define the model One Health surveillance system**

- **Develop a practically implementable surveillance framework and good practice guidelines**

- Assess what is known today about the presence of potential zoonotic pathogens, including current hotspot identification work

- Identify existing international guidance for integrated disease surveillance and the level of implementation

- Identify existing agreements and systems allowing/facilitating sharing of surveillance data.

- Provide guidance for interlaboratory systems for sharing of samples, data, results to provide early detection and diagnosis of disease pathogens

4. IDENTIFY FACTORS CONTRIBUTING TO SPILLOVER AND SUBSEQUENT SPREAD OF DISEASES AND DEVELOP RISK MANAGEMENT FRAMEWORK

This includes all factors such as wildlife trade, food production and distribution, traditional markets, land-use changes, biodiversity, animal production and trade, human action, biosafety and biosecurity, any other relevant environmental issues, including climate change

- **Identify key drivers of spillover**
- **Consider tools already available for multisectoral risk assessments; for example, investigate if HACCP principles could be adapted as risk assessment possibilities.**
- Systematically analyse the evidence for risk of zoonotic spillover.
- What are the gaps, what factors are neglected and what should be prioritized?

5. OVERARCHING ACTIONS FOR THE PANEL

- Bring all aspects of the different working groups together
- Develop a portfolio of key issues, knowledge and evidence gaps and prioritize these for their potential impact on prevention of emerging zoonoses, and as part of the development of a research agenda
- Give guidance and inputs to the work of generating knowledge and evidence on One Health of the Partners, including the Knowledge and Evidence Network and the One Health Joint Plan of Action
- Make evidence-based recommendations to the Partners for global, regional, national and local action
- Share the work of OHHLEP in key forums and media

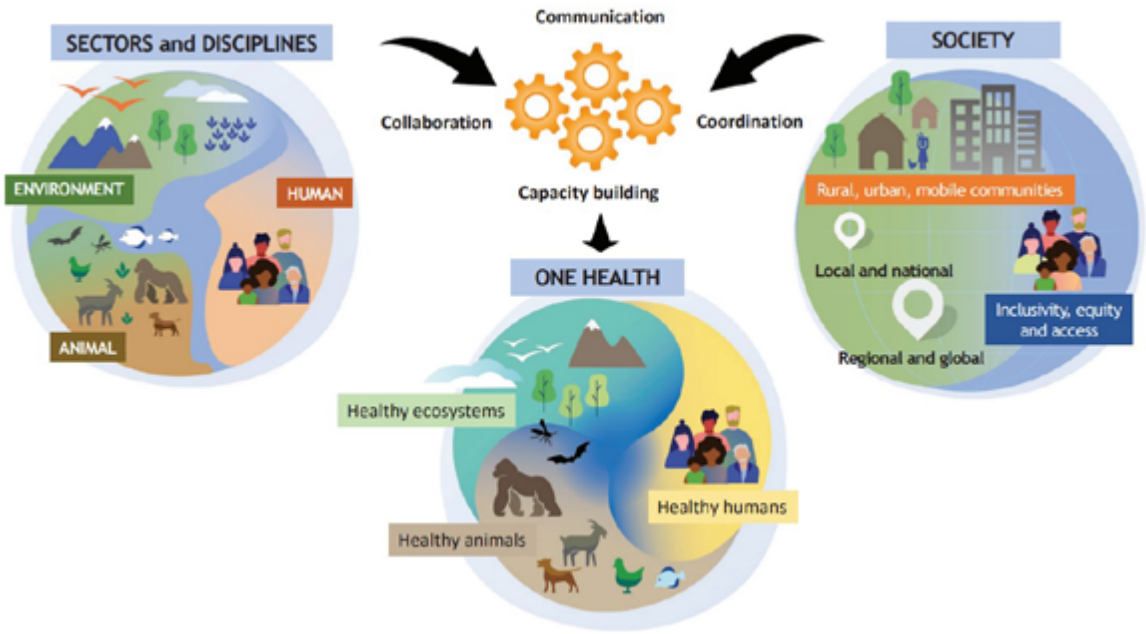
WORK PLAN PROGRESS REPORT

1. One Health Definition

A key first deliverable of OHHLEP was the development of a new definition of One Health as the basis for the future work of OHHLEP. This definition was welcomed and published by the Partners on 1 December 2021 (see Annex three for link to statement by the Partners). The One Health definition developed by the OHHLEP states:

> One Health is an integrated, unifying approach that aims to sustainably balance and optimize the health of people, animals and ecosystems.
>
> It recognizes the health of humans, domestic and wild animals, plants, and the wider environment (including ecosystems) are closely linked and interdependent.
>
> 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.

Figure 1. OHHLEP One Health Definition visual



To arrive at this definition, OHHLEP conducted a review of existing definitions used by the Tripartite and other leading organizations from around the world. The definition builds on these and similar concepts from related fields of EcoHealth and Planetary Health. In addition to reflecting the interdependent health of people, animals and ecosystems as do most definitions of One Health, OHHLEP's definition addresses intersectoral implementation considerations: propelling One Health from theory to practice, by highlighting the central role of intersectoral actions: communication, coordination, collaboration and capacity building (Figure 1).

The OHHLEP One Health definition aims to be comprehensive and promote a clear understanding and translation across sectors and areas of expertise. While health, food, water, energy, and environment are all wider topics with sector-specific and specialist concerns beyond the scope of One Health approaches, their *interface* is where multiple sectors have shared responsibility and relevance in protecting health, addressing health challenges such as the emergence of infectious diseases and promoting health and integrity of our ecosystems. The One Health approach can potentially address the full spectrum of disease control from prevention, health improvement and health promotion, to the detection, preparedness for, response and recovery from health crises.

Box 1. OHHLEP One Health Definition Foundational Principles

1. Equity between sectors and disciplines.
2. Sociopolitical and multicultural parity (the doctrine that all people are equal and deserve equal rights and opportunities) and inclusion and engagement of communities and marginalized voices.
3. Socio-ecological equilibrium that seeks a harmonious balance between human—animal-environment interaction and acknowledging the importance of biodiversity, access to sufficient natural space and resources, and the intrinsic value of all living things within the ecosystem.
4. Stewardship and the responsibility of humans to change behaviour and adopt sustainable solutions that recognize the importance of animal welfare and the integrity of the whole ecosystem, thus securing the well-being of current and future generations.
5. Transdisciplinarity and multisectoral collaboration which includes all relevant disciplines, both modern and traditional forms of knowledge and a broad representative array of perspectives.

OHHLEP CONDUCTED A REVIEW OF EXISTING DEFINITIONS USED BY THE TRIPARTITE AND OTHER LEADING ORGANIZATIONS FROM AROUND THE WORLD.

The approach is applicable at community, subnational, national, regional, and global levels, and relies on shared and effective governance, communication, collaboration and coordination to understand co-benefits, risks, trade-offs and opportunities for equitable and holistic solutions.

Additionally, while the scope of OHHLEP's work relates strongly to the broad aims and objectives of health security (as well as by extension, sustainable food, water and energy security), we wish to strike a careful balance between the hard realities of a global geopolitical paradigm dominated by economics, security and self-interest, and our collective aspirations for a better world. Box 1 describes the foundational principles that ensure One Health actions are effective, fair and sustainable.

A short manuscript explaining the definition with OHHLEP inputs will be submitted for publication in a scientific journal. A pre-final version of the definition was presented at the World Health Summit in October 2021. The definition was also shared by the Partners on their official websites and social media feeds (list in Annex 3).

2. Inventory of One Health Resources

For OHHLEP to understand and advise the Partners in the One Health sphere, it was necessary to create an inventory of relevant Partner initiatives and other relevant activities and initiatives globally. The plethora of new initiatives labelled 'One Health' makes it difficult to keep track. OHHLEP first obtained information from the Partners regarding their initiatives. OHHLEP co-chairs and some OHHLEP members (including rapporteur, working-group co-chairs) received briefings on relevant initiatives including Preventing Zoonostic Disease Emergence (PREZODE) and Zoonotic Disease Integrated Action (ZODIAC). OHHELP was also briefed on the Scientific Advisory Group for the Origins of Novel Pathogens (SAGO) by WHO Head of Emerging Pathogens Maria Van Kerkhoven and on the Global Leaders Group on Antimicrobial Resistance (GLG-AMR).

OHHLEP also started collecting information more broadly. A database was created and populated by all OHHLEP members which contained information on the following: networks and initiatives, knowledge-sharing platforms, capacity building tools and projects. Details of the focus and scope of One Health or definition used were included to assess the extent to which the One Health concept was applied. The specific geographic region and disciplines were also included. In addition, the following keywords were considered:

- One Health, collaborative, collaboration, multisectoral, transdisciplinary, ecosystem health, disease ecology, conservation medicine, ecological health, EcoHealth, One medicine, global one health, planetary health,
- Zoonoses, emerging infectious diseases, animal-human interface, human-animal-environment interface
- Infectious disease and the following terms: spillover, spillback, wildlife, domestic animals, livestock, biodiversity, ecology, anthropology, human behaviour, social science, communities

OHHLEP also initiated an inventory of published literature on One Health (using the keywords above) relating to emerging zoonotic disease threats.

3. Develop a model surveillance system

The definition of surveillance differs among partner organizations. For example, UNEP, given its mandate, does not use a single surveillance definition. Given the new OHHLEP OH definition and the historically siloed surveillance systems across the human, animal and ecosystem health dimensions of One Health, defining an optimal Health surveillance system that is operationally feasible is a key goal of OHHLEP.

OHHLEP reviewed what is currently considered as One Health surveillance, examples of existing One Health surveillance systems, and identified key components of an optimal One Health surveillance system. This was done by inventories of the Partners, literature review, and questionnaires completed by OHHLEP members. There are clear gaps in surveillance that, often for reasons outside of the scope of the partners, due to previous historic priorities, are not dealt with by any agency. This is also reflected in national surveillance systems.

Key elements of a model One Health surveillance system were described, focusing on leadership, communication and coordination, and operational implementation. Although primarily intended for international Partners, the framework could also be implemented at the national level or more local and regional level. Although a work in progress, key elements of the system were identified, such as:

- Strong governance and accountability of One Health functions and policies; high-level leadership
- Multi-sectoral: public health and medicine, animal health and environment were all considered equally important
- Independent scientific expert advice to the decision makers
- Coordination office and functions across sectors and across jurisdictions and internationally; consideration of nesting similar coordination and roles for OH at all levels
- Cooperation and coordination across laboratory, clinical, public and animal health agencies and environmental monitoring agencies.
- Consideration to be given on the role of other sectors such as finance, public safety in supporting OH surveillance; role of non-governmental stakeholders such as research and academic institutes, community and civil society organizations.

- Implementation challenge is considerable; barriers and knowledge gaps were identified.
- Although most available examples focus on detection of human and zoonotic animal pathogens, there is a need to consider integrating environmental and socio-economic drivers of spillover.

Next steps for this work on a model for One Health surveillance are to collate the views and perspectives of OHHLEP into a coherent set of recommendations, along with finding specific case studies across the range of functions that are recommended, that act as models for best practice. A set of publications is anticipated to be shared later in 2022.

THERE ARE CLEAR GAPS IN SURVEILLANCE THAT, OFTEN FOR REASONS OUTSIDE OF THE SCOPE OF THE PARTNERS, DUE TO PREVIOUS HISTORIC PRIORITIES, ARE NOT DEALT WITH BY ANY AGENCY.

4. Identify drivers of zoonotic spillover and risk assessment

Increasing evidence suggests that the majority of novel, emergent infectious diseases originate from animals and that the majority have emerged from wild animals over recent decades. Major drivers of this emergence are human activities, including land use and ecosystem changes, and changes to the ways people interact with animals, such as new or increased human-wildlife interfaces. Most of these, in turn, have complex social, cultural and economic drivers. Traditionally, and even after the emergence of COVID-19, the response to disease emergence and spread has been to focus on increasing human knowledge of what pathogens exist, where they may be found, and improving early detection and surveillance of cases of human disease. Unfortunately, these approaches do not prevent zoonotic spillover events and as exemplified by COVID-19, even relatively early detection of a new disease does not necessarily mean it will be effectively contained. OHHLEP seeks to identify the up-stream drivers of zoonotic spill-over and how to mitigate these to prevent disease emergence from occurring in the first place.

OHHLEP began work to identify key drivers of zoonotic disease spillover, drawing on an extensive review of the literature. Putative generic drivers have been identified. Amongst others, these include land-use changes and changes in agricultural practices (e.g., agricultural expansion, the intensification of livestock farming); the hunting and farming of, and trade in, wildlife; environmental factors including changes related to climate change. This working group is now testing if the Hazard Analysis and Critical Control Point (HACCP) process can be applied to these drivers. This process, which is widely used in industry, including food safety, identifies risky activities and processes, and how to mitigate these risks, without requiring detailed knowledge or identification of the individual threats (e.g. pathogens). As such, HACCP could provide a simple, generic approach to identifying the most effective and cost-effective measures of zoonotic spillover prevention. While the process has been applied to some drivers, or hazards, identified from the literature review, others are yet to be completed. Once this has been done for the main drivers identified, the process will be shared with key stakeholders to further validate the idea, followed by wider dissemination, e.g. via a scientific paper.

5. Partners' One Health Joint Plan of Action

A key contribution of OHHLEP during 2021 was to support the development of the Partners' One Health Joint Plan of Action (OH-JPA) and in particular toward its Theory of Change. This was an example of OHHLEP members supporting and advising the Partners on a knowledge product and overarching strategy, to help shape this important guidance document that will be used to guide the actions and activities of the Partner organizations for years to come. With a 5-year horizon, the OH-JPA aims to be a technical document providing a framework with joint vision and commitment allowing the four partner organizations to work together effectively to implement One Health. Through the OH-JPA, the Partners also aim to support implementation by member countries, enable collaboration across sectors and regions, identify synergies and overlaps to support coordination and mobilize investment including better use of resources.

The Theory of Change was created by Partner organizations in collaboration with OHHLEP through several joint meetings of OHHLEP and the OH-JPA drafting team, as well as 2 facilitated workshops of wider teams from the Partners as well as OHHLEP members.

The two OH-JPA long-term outcomes are: i) collaborations for One Health; and ii) improved health and sustainability outcomes. It describes medium-term outcomes for the period 2022-2026, that will be achieved by implementing actions along three Pathways. There are 6 Action Tracks with associated detailed lists of activities. There is one overarching Action Track on Strengthening One Health collaborative capacity. The other five Action Tracks are:

- Emerging zoonotic epidemics and pandemics,
- Neglected zoonotic diseases
- Food safety hazards
- Antimicrobial resistance
- Environment and health

In addition to supporting the production of a global vision and roadmap for One Health, OHHLEP's collaboration on the development of the OH-JPA was important to proactively identify where OHHLEP may best be able to contribute in pursuit of target outputs and outcomes. It also helped to clarify for OHHLEP the parameters of the plan, including aspects outside of the scope of the OH-JPA where additional Partners outside of the four agencies may be relevant when developing our internal Theory of Change. As of the end of 2021, OHHLEP members

were providing input on the full draft version of the OH-JPA, with next steps planned to overlay the OH-JPA and OHHLEP-specific Theories of Change to identify points of alignment as well as aspects that may be unique to OHHLEP's scope of work. OHHLEP will also provide inputs into the development of the implementation plan of the OH-JPA going forward.

6. OHHLEP Theory of Change

While developing the working definition of One Health, OHHLEP initiated a process of drafting its own Theory of Change for One Health. Existing Theory of Change frameworks used at national and organizational level were consulted to learn from and build on prior processes. The timing of this initial work was ideal to inform the Partners' OH-JPA Theory of Change.

of OHHLEP and the Partners will closely align their respective Theories of Change on One Health. The Partners' One Health Joint Plan of Action is targeted to specific action tracks for which the international Partners will be responsible. OHHLEP's efforts and therefore its theory of change on One health have flexibility in scope, for example to include community-based considerations and actions more directly. The OHHLEP Theory of Change will identify the activities to be pursued by OHHLEP specifically, while also connecting with the Partners' Theory of Change to reach target outcomes.

The OHHLEP Theory of Change is nearing completion. However, this is envisioned as a working document, with the expectation that it will be reviewed periodically and updated as the needs and landscape related to One Health evolve at global, national, and subnational levels.

7. Other OHHLEP Activities

During its first few months, OHHLEP co-chairs and members sought to build connections toward collaboration with other key One Health global initiatives. Several of these have been initiated, most notably, PREZODE, ZODIAC, the Scientific Advisory Group for the Origins of Novel Pathogens (SAGO and the Global Leaders Group on Antimicrobial Resistance (GLG-AMR).

OHHLEP developed communication material to help present its objectives and sought opportunities to increase the visibility of the Panel and its purpose. OHHLEP Co-Chairs spoke officially on behalf of OHHLEP and presented the pre-publication version of its One Health Definition at The World Health Summit in Berlin in October 2021. Annex 4 includes a list of key activities and presentations made by OHHLEP members that included information about the work of OHHLEP.

DURING ITS FIRST FEW MONTHS, OHHLEP CO-CHAIRS AND MEMBERS SOUGHT TO BUILD CONNECTIONS TOWARD COLLABORATION WITH OTHER KEY ONE HEALTH GLOBAL INITIATIVES.

Conclusion and Next Steps

As the world continues efforts to control the SARS-CoV-2 pandemic, including growing evidence of possible new animal and environmental reservoirs of the virus, there remains an urgent need for greater multisectoral and multilateral collaboration at all levels to help end the pandemic and for better prevention as well as improved preparedness for future pandemics and other health threats at the animal-human-environment interface.

The threats to the health of humans, animals and ecosystems are increasingly apparent and growing, due to combined crises of climate change and declining biodiversity, among other pressures on our collective health and wellbeing. Therefore, the work of OHHLEP continues to be very timely. Thanks to fast action by the Partners, OHHLEP was convened and began its work in a short period of time. With its input to the development of the Partners' One Health Joint Plan of Action, OHHLEP has shown its capacity to support policy development in real time. The publication of OHHLEP's new definition of One Health, has shown its capacity to work rapidly to contribute ideas that catalyze dialogue and inform implementation by the Partners and other stakeholders. Much work has also been done by OHHLEP toward inventorying One Health resources, creating a model integrated One Health surveillance system, identifying key drivers of zoonotic disease spillover and a model risk assessment and critical control point framework, and this work will continue in 2022. None of this would have been possible without support and genuine collaboration of experts from across all four Partner in a true One Health Cooperation.

In 2022, OHHLEP's work will include continued contributions to the Partners' One Health Joint Plan of Action and its implementation; advising Partners regarding the negotiations of the new pandemic prevention and response instrument/ treaty; finalizing and publishing OHHLEP's theory of change, advocating for a comprehensive, open-access international database of One Health initiatives and resources, publication of a model framework for One Health Surveillance, and an overview of key drivers of zoonotic disease spillover and framework for risk analysis of these. OHHLEP will pursue its work in collaboration and with the support of the partner agencies, and increasingly, in collaboration with other international and regional One Health initiatives.

ANNEXES

Annex 1
LIST OF OHHLEP MEMBERS

Last Name	First Name	Affiliation
ADISASMITO	Wiku Bakti	University of Indonesia
ALMUHAIRI	Salama	Abu Dhabi Agriculture and Food Safety Authority
BARTON BEHRAVESH	Casey	Centres for Disease Control and Prevention, USA *Serving in personal capacity
BILIVOGUI	Pépé	Project REDISSE (World Bank/ OOAS)
BUKACHI	Salome A.	Institute of Anthropology, Gender and African Studies, University of Nairobi
CASAS	Natalia	National Zoonoses Coordinator, Ministry of Health of Argentina, Argentina
CEDIEL BECERRA	Natalia	Universidad de la Salle - Bogotá
CHARRON	Dominique. F	International Development Research Centre, Canada
CHAUDHARY	Abhishek	Department of Civil Engineering, Indian Institute of Technology (IIT) Kanpur, India
CIACCI ZANELLA	Janice R	Brazilian Agricultural Research Corporation (Embrapa), Brazil
CUNNINGHAM	Andrew Alexander	Institute of Zoology, Zoological Society of London, Regent's Park, London NW1 4RY, UK

Last Name	First Name	Affiliation
DAR	Osman	UK Health Security Agency Chatham House, Royal Institute of International Affairs
DEBNATH	Nitish	DAI Global, LLC One Health Bangladesh
DUNGU	Baptiste	Onderstepoort Biological Products SOC (OBP), South Africa
FARAG	Elmoubasher	Qatar Ministry of Public Health (MOPH)
GAO	George Fu	Chinese Center for Disease Control and Prevention
HAYMAN	David. T.S.	Molecular Epidemiology and Public Health Laboratory, Hopkirk Research Institute, Massey University, Palmerston North, New Zealand
KHAITSA	Margaret	Mississippi State University
KOOPMANS	Marion P.G.	Erasmus MC
MACHALABA	Catherine	EcoHealth Alliance
MACKENZIE	John S	Faculty of Health Sciences, Curtin University, Perth
MARKOTTER	Wanda	Centre for Viral Zoonoses, Department of medical Virology, University of Pretoria, South Africa
METTENLEITER	Thomas	Friedrich-Loeffler-Institut, Federal Research Institute for Animal Health, Germany
MORAND	Serge	CNRS, Montpellier University
SMOLENSKIY	Vyacheslav	Russian Federal Service for Surveillance on Consumer Rights Protection and Human Wellbeing
ZHOU	Lei	Chinese Center for Disease Control and Prevention

Annex 2
LIST OF VIRTUAL OHHLEP MEETINGS IN 2021

Meeting 1, May 17-18, Minutes
Meeting 2, July 29-30, Minutes
Meeting 3, September 30-October 1, Minutes
Meeting 4, December 9-10, Minutes

Annex 3 ONE HEALTH DEFINITION DISSEMINATION BY THE PARTNERS

A. Joint statement by the Partners on the OHHLEP One Health definition

Available at: Tripartite and UNEP support OHHLEP's definition of "One Health" (who.int)

B. List of sites where definition was published by the Partners.

OIE

- Website: https://www.oie.int/en/tripartite-and-unep-support-ohhleps-definition-of-one-health/
- Twitter - https://twitter.com/OIEAnimalHealth/status/1466349081048006665?s=20
- LinkedIn - https://www.linkedin.com/feed/update/urn:li:activity:6872119662000279552

FAO

- https://www.fao.org/3/cb7869en/cb7869en.pdf
- https://twitter.com/FAOLivestock/status/1466001875124715 53
- https://twitter.com/FAOLivestock/status/1466368326799564 80

WHO

- https://www.who.int/news/item/01-12-2021-tripartite-and-unep-support-ohhlep-s-definition-of-one-health

UNEP

- https://www.unep.org/news-and-stories/statements/joint-tripartite-and-unep-statement-definition-one-health

Annex 4 CONTRIBUTIONS BY OHHLEP MEMBERS ON BEHALF OF OHHLEP ARRANGED BY DATE

Date	OHHLEP Panel member	Event/ platform/ Initiative	Description/ Title of contribution	Virtual link to contribution (if available)
19-May-21	Wanda Markotter and Thomas Mettenleiter	Global Health Summit; G20	Introduction to OHHLEP	https://youtu.be/lJmKIIMUtdU
31-May-21	Serge Morand	Eklipse workshop	Panel discussion, Podcast	https://eklipse.eu/request-biodiversity-pandemics/
31-May-21	Thomas Mettenleiter	Eklipse workshop	Panel discussion, Podcast	https://eklipse.eu/request-biodiversity-pandemics/
06-Jul-21	Andrew Cunningham	FAO global dialogue on the role of food and agriculture in the global biodiversity framework	Technical contribution on biodiversity and one health	https://www.fao.org/3/cb7030en/cb7030en.pdf
06-Jul-21	Nitish Debnath	WHO#Learning-SavesLives Webinar on Zoonosis day	Panel discussion	https://youtu.be/2l4Kt1Pw46Y
Aug-21	Elmoubasher Abd Farag	Global One Health Award	Expert/Draft the proposal	
Aug-21	Elmoubasher Abd Farag	Sudan Joint Risk Assessment Workshop on Zoonotic Diseases	Expert facilitator	

Date	OHHLEP Panel member	Event/ platform/ Initiative	Description/ Title of contribution	Virtual link to contribution (if available)
31-Aug-21	Nitish Debnath	Training on Core Competencies: Policy and Advocacy, One Health Leadership	Expert facilitator	https://www.ecohealthalliance.org/2019/10/ecohealth-alliance-part-of-a-consortium-awarded-usaid-contract-to-build-global-capacity-for-one-health
02-Sep-21	Catherine Machalaba	Global Roundtable End Pandemics: Appeal to World Leaders	How pandemics occur	https://www.youtube.com/watch?v=5SRX-LfvEwCc
05-Sep-21	Wanda Markotter	World Conservation conference, Marseille France	Address animal issues relating to the "One Health" approach, panel discussion	https://www.iucn-congress2020.org/
20-Sep-21	Andrew Cunningham	Meeting at the Danish Parliament convened by the Vegetarian Society of Denmark	Preventing future epidemics through a more plant-based food system	https://drive.google.com/drive/u/0/folders/1fYWA-6duN4CZCaviK-WtWRjHRb2vh-8GwJT
21-Sep-21	Wanda Markotter	Special meeting of the G20 Advocacy	Presenting OHHLEP to representatives of the South African government	
23-Sep-21	Wanda Markotter	Ministerial meeting of the Alliance for multilateralism	Introducing OHHLEP	
23-Sep-21	Natalia Casas	Course on update on Hydatidosis. Faculty of Exact and Natural Sciences. National University of Mar del Plata, Argentina	One Health: Epidemiological Surveillance, Prevention and Control of Hydatidosis	
21-22-Sept-2021	Serge Morand	IAEA General Assembly Scientific Forum, Vienna, Austria	Panel discussion	https://www.iaea.org/about/governance/general-conference/gc65/scientific-forum/programme

Date	OHHLEP Panel member	Event/ platform/ Initiative	Description/ Title of contribution	Virtual link to contribution (if available)
21-22-Sept-2021	Thomas Mettenleiter	IAEA General Assembly Scientific Forum, Vienna, Austria	Preparing for Zoonotic Outbreaks: the Role of Nuclear Science, Panel Discussion, Science Corner, Podcast	https://www.iaea.org/about/governance/general-conference/gc65/scientific-forum/programme
30-Sep-21	Nitish Debnath	Tripartite Advocacy Webinar on AMR, Food Safety and One Health in Asia	Expert	https://www.who.int/southeastasia/news/events/detail/2021/09/29/south-east-asia-events/webinar-on-the-fao-oie-who-one-health-approach-to-amr-mitigation-and-safer-food-in-the-asia-pacific-region
03-Oct-21	Abhishek Chaudhary	Live telethon hosted by Indian national news channel NDTV	Media interview	https://www.youtube.com/watch?v=Y-bX-AZFkzjg&ab
06-Oct-21	Wanda Markotter	Montpellier Global Days Africa	Panel discussion; Interconnections among the challenges of food systems, climate change, biodiversity loss and health issues	https://www.iddri.org/en/publications-and-events/presentation/new-africa-france-summit-montpellier-global-days
07-Oct-21	Wanda Markotter	Biosecurity Level 4 Laboratory Zoonoses Network BSL4ZNet	One Health: Holistic Approaches to Post-Pandemic Challenges panel discussion	https://pheedloop.com/bsl4znet2021/site/schedule/
07-Oct-21	Dominique Charron	Biosecurity Level 4 Laboratory Zoonoses Network BSL4ZNet	One Health for a Sustainable and Inclusive Pandemic Recovery	https://pheedloop.com/bsl4znet2021/site/schedule/

Date	OHHLEP Panel member	Event/ platform/ Initiative	Description/ Title of contribution	Virtual link to contribution (if available)
08-Oct-21	Wanda Markotter	Africa-France Summit in Montpellier	Panel discussion; The role research and education can play to meet the challenges we face to address interconnected agriculture, food, environment and health challenges	https://en.montpellierglobaldays.fr/
13-Oct-21	Dominique Charron	Annual Conference of Animal Health Professionals of Québec. Quebec Ministry of Agriculture and Fisheries (Canada)	One Health for Inclusive and Sustainable Recovery from the Pandemic (Une Seule Santé pour un redressement de la pandémie équitable et durable)	
22-Oct-21	Nitish Debnath	FAO EMPRES-i+ Launching of New Global Animal Disease Information system	Panel discussion	https://www.fao.org/webcast/home/en/item/5660/icode/
24-Oct-21	Wanda Markotter	World Health Summit, Berlin Germany	One Health: Good Practices and Challenges panel discussion	https://www.conference.worldhealthsummit.org/
24-25-Oct-2021	Thomas Mettenleiter	World Health Summit, Berlin Germany	WS 02: One Health: Focus on Zoonoses; WS14: The power of partnership in Global Health Protection	https://www.conference.worldhealthsummit.org/
29-Oct-21	Nitish Debnath	Keynote speaker Annual Conference of Zoological Society of Bangladesh	COVID-19Challenges: Integrating human health, zoonotic diseases and ecosystem conservation	https://www.zsbd.org.bd/Conference-AGM-35.html
Nov-21	David Hayman	Health Environment Research Agenda (HERA) for Europe (EU funded) Webinar	Biodiversity and Health: Global challenges and threats	https://www.heraresearcheu.eu/news/webinar-no-4-biodiversity-and-health

Date	OHHLEP Panel member	Event/ platform/ Initiative	Description/ Title of contribution	Virtual link to contribution (if available)
02-Nov-21	Osman Dar	COP26 Health Pavilion	OHHLEP One Health definition	https://cdn.who.int/media/docs/default-source/climate-change/cop26-health-pavilion-events.pdf?sfvrsn=b5337478_5
2-4-Nov-2021	Natalia Casas	XX International Symposium on Neglected Diseases. Mundo Sano Foundation, Argentina	One Health: zoonoses and the need for an integral approach	https://www.youtube.com/watch?v=f_2cnqEPXCk
09-Nov-21	Nitish Debnath	P2RFWebinar: strengthening PHE Preparedness through One Health	Panel discussion	https://p2rf.org/#:~:text=The%20Prepared%20to%20Respond%20Learning,approaches%20they%20have%20applied%20to
11-Nov-21	Catherine Machalaba	COP26 Health Pavilion event on Climate Change Crisis and One Health	A dialogue between experts from the Food and Agriculture Organization of the United Nations (FAO), the World Health Organization (WHO), the UN Environment Program (UNEP) and the World Organisation for Animal Health (OIE)	
23-25-Nov-2021	Natalia Casas	XXXV National Conference of Hydatidosis and LVII International Hydatidosis Conference. Ministry of Health of Río Negro, Argentina	One Health approach to Cystic Echinococcosis control and surveillance	https://www.youtube.com/watch?v=mMAnVNqey8k

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29-Nov-21	Osman Dar	Royal Society of Medicine – One Health programme day	OHHLEP introduction and One Health definition	https://www.rsm.ac.uk/events/comparative-medicine/2021-22/cmq01/
30-Nov-21	Natalia Cediel	Taller Internacional de One Health y Cambio Climático 2021	One Health, climate change and gender	https://tallerohcc.org/ https://play.4id.science/1health/conferencias/BK119HF
01-Dec-21	Natalia Cediel	Cambio Climático en Colombia Realidades, Desafíos y Oportunidades	One Health and climate change	https://www.youtube.com/watch?v=WD-nXG-BHoOI
Dec-21	David Hayman	7th One Health Aotearoa Symposium – 2021	One Health approaches to pandemic prevention	https://one-health.org.nz/wp-content/uploads/2021/12/Hayman-7OHA.pdf
03-Dec-21	Natalia Cediel	IX Encuentro Anual de Medicina Veterinaria 2021 de la Universidad Nacional de Costa Rica	Challenges and advantages of OH implementation for surveillance, prevention and control of zoonoses	https://youtu.be/RiNga7QuGyE
16-Dec-21	Nitish Debnath	Interview with DAI on New definition of One Health	Media interview	https://dai-global-developments.com/articles/q-and-a-how-the-one-health-approach-is-evolving-more-sustainably-and-inclusively
21-Dec-21	Nitish Debnath	Indian Vet Association	Keynote speaker on One Health Approach: Vet Perspective	

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