European OneHealth/EcoHealth workshop report

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Workshop organised by the Biodiversity & Health Community of Practice
coordinated by the Belgian Biodiversity Platform

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EUROPEAN ONEHEALTH / ECOHEALTH WORKSHOP REPORT

This is the report of the European One Health / Eco Health Workshop that took place on 6th and 7th October 2016 in Brussels, organised by the Belgian Community of Practice Biodiversity & Health which is facilitated by the Belgian Biodiversity Platform.

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The workshop organisation was coordinated by Hans Keune (*Belgian Community of Practice Biodiversity & Health / Belgian Biodiversity Platform*) with support from representatives from several Belgian and international organisations: Lucette Flandroy and Pierre Biot (*Belgian Federal Public Service Health, Food Chain Safety and Environment - DG Environment*), Thierry van den Berg, Marcella Mori and Nick De Regge (*Veterinary and Agrochemical Research Centre - CODA-CERVA*), Séverine Thys and Isra Deblauwe (*Institute of Tropical Medicine of Antwerp*), Maarten P.M. Vanhove *(Royal Belgian Institute of Natural Sciences, RBINS/ CEBioS)*, Nicolas Antoine-Moussiaux (*University of Liège, Faculty of Veterinary Medicine - ULiège)*, Javiera Rebolledo, Steven Van Gucht *(Scientific Institute of Public Health - WIV-ISP)* and Herman Van Oyen *(Research Institute Nature & Forest - INBO)*, Cristina Romanelli *(CBD and UNU IIGH)* and Marina Maiero *(WHO)*, Barbara Häsler *(Royal Veterinary College London UK and Network for Evaluation of One Health - NEOH)*, Aurélie Binot *(French agricultural research and international cooperation organisation - CIRAD* and *ComAcross EU project*), Wim Hiemstra *(Dutch Farm Experience/Natural Livestock Farming)*.

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INTRODUCTION

The workshop organisation was coordinated by Hans Keune (*Belgian Community of Practice Biodiversity & Health / Belgian Biodiversity Platform*) with the support of representatives from several Belgian and international organisations: Lucette Flandroy and Pierre Biot (*Belgian Federal Public Service Health, Food Chain Safety and Environment - DG Environment*), Thierry van den Berg, Marcella Mori and Nick De Regge (*Veterinary and Agrochemical Research Centre - CODA-CERVA*), Séverine Thys and Isra Deblauwe (*Institute of Tropical Medicine of Antwerp*), Maarten P.M. Vanhove *(Royal Belgian Institute of Natural Sciences, RBINS/ CEBioS)*, Nicolas Antoine-Moussiaux (*University of Liège, Faculty of Veterinary Medicine - ULiège)*, Javiera Rebolledo, Steven Van Gucht *(Scientific Institute of Public Health - WIV-ISP)* and Herman Van Oyen *(Research Institute Nature & Forest - INBO)*, Cristina Romanelli *(CBD and UNU IIGH)* and Marina Maiero *(WHO)*, Barbara Häsler *(Royal Veterinary College London UK and Network for Evaluation of One Health - NEOH)*, Aurélie Binot *(French agricultural research and international cooperation organisation - CIRAD* and *ComAcross EU project*), Wim Hiemstra *(Dutch Farm Experience/Natural Livestock Farming)*.

Impression of the workshop

OVERVIEW OF OBSERVATIONS & RECOMMENDATIONS

A general overview of observations, conclusions and recommendations from the workshop is presented here:

1/ *One Health*, *EcoHealth*, *Planetary health* and related concepts share similar ambitions aimed at integration of various dimensions and realities that are influencing health. Though these different concepts have different histories within diverse expert contexts, the core message of integration are basically similar, and would benefit from greater complementarity in their implementation.

2/ The importance of a broad understanding of *One Health* was underlined, and should not only concern links between human and animal health. *One Health* would also benefit from integrating biodiversity, soil health, climate change, food security and agricultural systems, as well as rural and urban development. Furthermore, it would also benefit from an overall linkage to the sustainable human development in the various societies and cultures, taking account the diversity of well-being and health perceptions.
Ecology, agriculture, and social sciences were thus identified as the often missing links for a coherent *One Health* approach.

3/ Implementation of *One Health/ EcoHealth* concepts can benefit from transdisciplinary/ collaborative iterative process between policy, science and practice.

4/ Ecology and social sciences are identified as the missing links for a coherent *One Health* approach. Beside tackling biological threats to health, *One Health* should also take into consideration the benefits of nature to human health, and the ecological equilibriums and evolutions in their linkage to health (and therefore not focusing solely on fauna-derived hazards as is often the case). Social and cultural drivers of health are often neglected and considered only in

case of programme failure. The *One Health* approach would benefit from an earlier and deeper involvement of social science.

5/ As an example of link between agriculture and health: biodiversity preservation and use of livestock and cultivated plants, *ex situ* but mainly *in situ*, is not only a guarantee for future food security (by better resilience than mono-cultures and- strains facing environmental changes), it is also an insurance against amplification and diffusion of zoonotic diseases (since mono-strains and -cultures favour pathogens dispersion and amplification).

6/ A major advantage of considering public health in a *One Health* approach in its broader understanding is that it may help overcome *ad hoc* reactive actions facing emerging public health challenges and allow a more pro-active capacity-building in order to be better prepared for crises when needed. Beside the pure human and environmental benefits, experience has shown that preventing health crisis is less expensive than curing them. Capacities not only for response to public health challenges, but also for monitoring, detection, early warning, prevention and identification of potential crisis as well as basic scientific understanding underpinning the capacity, should be built in the North as well as in the global South. Scenarios of public health evolution, depending on evolution of various close or far concerned parameters, could be built on that integrated approach of knowledge assembled under chronic observatory data bases. Another financial benefit, at middle term, of the broadly understood *One health* approach is to avoid the duplication of activities by integrating some parts of monitoring human, animal and environment health.

7/ Prioritisation of diseases to monitor is necessary for financial reasons, even if not favored by all scientific experts. While initially complex, a *OneHealth/EcoHealth* approach integrating knowledge on vectors and pathogens biology/ecology, relationships of pathogens with hosts and their immune

response (short or long incubation times), morbidity/mortality caused by the diseases, ways of transport of potentially contaminated animals and vectors, can help to take relevant decisions on prioritisation for monitoring (of diseases, vectors, places). The priority would then not necessarily always be on current prevalent diseases.

8/ While *One Health* should mainly correspond to an open state of mind and an evolving concept, there is a need to develop common understanding of *One Health* and related concepts and to develop criteria and indicators for application and evaluation in practice. Along with clarity, common understanding may also benefit for some flexibility for tailoring to specific local contexts and processes.

9/ Inter- and transdisciplinary education at all levels (basic and higher education, life-long learning) is needed to allow for inter- and trans- disciplinary collaboration and decisions throughout life. In its vast majority, the present educational systems, in particular in scientific domains, do nt help building the needed bridges between disciplines, between science and society, nor collaborative skills. We have to learn and respect different interests, perspectives of the world, ways of thinking, habits of practices, but also constraints, of different professional and social groups, between which conventional hierarchical considerations should be abolished.

10/ Creating *One Health* institutes/consortia/ institutions entails the risk of again building fences rather than creating openness to (new) collaborations. This could be overcome by focusing on open, collaborative networks such as communities of practice, which are less bounded and more flexible, and open to newcomers, new ideas and innovative approaches. Not limited to scientific experts, such groups would benefit from being open to policy experts, local/ community knowledge holders, practitioners, education and business representatives, etc. Since the contribution of all stakeholders

and civil society actors should be acknowledged as valuable and useful.

11/ Constructive iterative processes between policy, research, and field work could lead the implementation of the *One Health/EcoHealth* concept.

12/ The private sector that uses, transforms, or sells biodiversity extracted elements or that disturb the ecosystems could also be involved in the *OneHealth/EcoHealth* perspective. They could become aware of sustainability concerns and the risks of epidemics fostered by these disturbances; therefore understanding how their activities could be improved for a more sustainable environment, and the protection of human health at the local and global level. International trade is concerned by the *OneHealth/EcoHealth* approach; in particular with regard to the environmental cost of international goods transport, which should start to be taken into account.

13/ Since inter- and trans-disciplinary education is currently not available, starting from successful case-studies that easily show the added-value of inter and trans-disciplinary research and collaboration can favour the establishment of collaborations that could further be useful in time of emerging crisis.

14/ Beside collaboration between experts that could lead to improved top-down decisions, interaction with the general public and citizens at large can lead to beneficial bottom-up changes and initiatives. Popularisation of the *One Health* concept is crucial for the public to behave more responsibly, to prevent epidemics, on the basis of complex integrated knowledge. Listening to local knowledge and perception of health and environment can also bring useful information that should be respected. Maintaining the health of ecosystems and one's personal health as part of a healthy ecosystem is indeed a shared responsibility of scientists, citizens and decision makers. This calls for better and more frequent communication and

interactions between these different groups. Part of the work of social scientists (including anthropologists) should be integrated in this interaction between different forms of knowledge and perceptions.

NEXT STEPS

Building on the workshop's results, a *European OneHealth/EcoHealth Community of Practice* could be created to support and nourish several networking initiatives and ideas that were discussed among participants. Such a group could also be of susport to existing initiatives, such as the *Network for Evaluation of One Health (NEOH)*. Concrete examples of such initiatives emerging from the workshop include:

- A network on transdisciplinary *One Health* education
- A network on the role of social science in *One Health/EcoHealth*
- A network that would help to translate research findings on the Environment-Microbiome-Health axis into policy making, with a view to make healthy ecosystems a cost-effective disease prevention healthcare strategy.

INTRODUCTION TO THE WORKSHOP

The general objective of the E*uropean OneHealth/ EcoHealth workshop* was to build bridges on *OneHealth*, *EcoHealth* and related concepts that try to combine ecosystem-, animal and human health, and to build bridges between science, policy and practice working on nature and health. This, in line with work carried out under the CBD-WHO joint work programme on biodiversity and human health. Given the similarities in their stated objectives, *OneHealth* and *EcoHealth* concepts were addressed as a single approach, illustrating the aim to go beyond narrow and restricted framings of integrative approaches. The focus was on making connections and building bridges not only across environmental and public health but also with other sectors. It brought together people from different communities in science, policy and practice to exchange experiences and views, and to discuss opportunities and challenges for integration and practical steps forward. A wide diversity of experts contributed: from different professional backgrounds (science, policy & practice), different fields of expertise and countries, both within Europe and beyond, as well as a combination of senior and junior experts. This included natural scientists, health scientists and social scientists, policy representatives from national governments and the EU, and experts working in Europe, but also in other regions in the world including the global South. The *Belgian Community of Practice Biodiversity & Health* (COPBH) initiated the organisation of the workshop that was generously financed mainly by the *Belgian Biodiversity Platform* (BBPF), the *Belgian Science Policy Office* (BELSPO) and the *Belgian Federal Public Service Health, Food Chain Safety and Environment* (FPSPH) and with additional budget from the *Veterinary and Agrochemical Research Centre* (CODA-CERVA), the *Institute of Tropical Medicine of Antwerp* (ITM), the *Royal Belgian Institute of Natural Sciences* (RBINS)/ *Capacities for Biodiversity and Sustainable Development* (CEBioS), the *University of Liège*, the *Faculty of Veterinary Medicine* (ULiège), the *Scientific Institute of Public Health* (WIV-ISP), the *Network for Evaluation of One Health* (NEOH).

PLENARY SESSIONS

The workshop opened on October 6, 2016. During the opening ceremony, Mrs. Aline Van der Werf welcomed the participants to the *Belgian Science Policy Office* (BELSPO) where the meeting was hosted, emphasizing the importance of community building on this important topic for science, policy and practice.

The first plenary session, chaired by Thierry Van Den Berg (CODA-CERVA), began with key introductory presentations: these presentations were video recorded and can be found on the workshop website.

The first presentation of Cristina Romanelli (CBD) focused on *Biodiversity and Human Health: Context and opportunities for cross-sectoral collaboration*. The presentation introduced the institutional context that led to the development of the *State of Knowledge Review* under the CBD-WHO joint work programme, providing an overview of key thematic areas and emphasizing the cross-sectoral collaboration required to successfully mainstream its findings and to meet global commitments including for the *Strategic Plan for Biodiversity 2011-2020* and the *Sustainable Development Goals*.

Richard Kock *(Royal Veterinary College of the University of London)* then gave a presentation on *Emerging diseases and the environment - can't see the wood for the trees?* He pleaded for a broader vision on health, not solely centered on human health, but also focusing on the need to adopt integrative approaches to address the challenges associated with infectious disease outbreaks. Richard Kock mentioned that the various impacts of humans on the environment, of which physical or chemical disturbance (climate change, land degradation through food systems and extractive industries, floods, chemical pollution, livestock industrial raising, etc.), are favouring the amplification of infectious diseases. He pointed that wild animals have become much less numerous than domesticated animals, at least in industrialised countries.

The latter would thus be more susceptible to expand zoonotic diseases than wild animals.

Serge Morand *(University of Montpellier & CIRAD)* followed with a presentation on *Biodiversity and Health*, discussing the impacts of biodiversity loss on human health and challenges of dealing with related complexity. He noticed that the high loss in biodiversity is simultaneous and linked to the loss in cultural diversity, that leads to the loss of traditional knowledge on the importance of biodiversity, making it thus difficult to create or implement programmes encouraging diversity preservation (in particular, in agriculture and livestock). Water biodiversity is also dramatically threatened among others through various human-driven pollutions, while still more unnoticed than for terrestrial biodiversity. He recognised that the two visions of biodiversity: being good or bad for health, that prevail in different respective groups, are the two faces of the same issue which is the equilibrium of ecosystems functioning. A lot of knowledge regarding loss of biodiversity and related ecosystem functions and services is accumulating, but it is not sufficiently integrated towards appropriate decisions and initiatives.

Finally, Birgit Van Tongelen (*EU – DG Research and Innovation*) presented *Fighting Infectious Diseases and Advancing Public Health - Emerging epidemics*, introducing EU activities related to *One Health* research. The *One Health* projects strategy of the *European Commission* are addressing emerging epidemics through five pillars: Reason of emergence (biology/ecology of the diseases); Early detection (development of new diagnostic tools - link clinic/epidemiology); Rapid responses, preparedness (coordination of research and policy responses); Development of new drugs & vaccines; Development of effective communication tools to humans and between medical doctors and veterinary doctors.

Following the presentations, a plenary debate with the audience took place.

The second plenary part of the programme was developed in close collaboration with the *Network for Evaluation of One Health* (NEOH). NEOH aims to enable future quantitative evaluations of *One Health* activities and to further the evidence-base by developing and applying a science-

From left to right: Richard Kock, Cristina Romanelli and Serge Morand

based evaluation protocol in a community of experts. This plenary was chaired by Sue Welburn *(Edinburgh Medical School)*: all these presentations were video recorded and can be found on the workshop website. The plenary recognised that the *One Health* and related approaches have been gaining momentum. However it is not clear if and how the *One Health* concept is addressed, particularly in practice in many countries. A leading issue during this plenary session was to reflect on what science and policies include in the *One Health* concept and how scientific knowledge and policy strategies can move from theory to practice. Through case studies from Europe, Asia and Africa, the complexity (social aspects, social process) of knowledge operationalisation and management was discussed. The session included the following introductory presentations:

Barbara Häsler *(Royal Veterinary College, NEOH chair)* on *Network for Evaluation of One Health* (NEOH), Aurèlie Binot (CIRAD) on *Strengthening synergies among disciplines and sectors & Challenging One Health stakeholders*, and Hans Keune (COPBH/ *Belgian Biodiversity Platform*) on *One Health* survey results (gathered in advance of the workshop), feeding into breakout groups discussions.

In his speech preceding the dinner offered on the first evening of the workshop, Christiaan Decoster, Chairman of the *Direction Committee of the Belgian Federal public Service Health, Food Chain Safety and Environment* stated that these *"Topical sessions were separated to facilitate the discussions but clear links exist between the specific areas tackled. Indeed, vectorial borne and other zoonotic diseases emergence can be influenced by land planning for agriculture. The inappropriate use of antibiotics, notably by agriculture, leads to resistant pathogens and death of microorganisms beneficial for our health. Such microorganisms are also a part of the nature health benefits brought by green and biodiversity rich spaces in urban areas, that have become the main surrounding environment of human beings on this planet."* Furthermore, Mr Decoster insisted on the importance of the capacity to fight against ancient and new pathogens in this period of (re)-emergence of infectious diseases, and in parallel on the wide problematic of antibiotic resistance. In a *OneHealth/EcoHealth* vision, one further step as an outcome of this workshop will be to bring links between the outcomes, reflections, and further suggested steps from these different topical sessions of the workshop.

In the final plenary part of the workshop, Lucette Flandroy (FPSPH) presented a synthesis of the workshop, to which Ladislav Miko *(DDG of DG Health, European Commission)* and Sophie Vandewoestijne *(DG Research and Innovation, European Commission)* reacted.

On behalf of the EU, Ladislav Miko *(DDG of DG Health of the EU Commission)* and Sophie Vandewoestijne *(DG Research and Innovation of the EU Commission)* reacted on the reporting from the workshop. These presentations were video recorded and can be found on the workshop website.

Ladislav Miko and Sophie Vandewoestijne insisted that both bottom-up and top-down initiatives are necessary and underlined the constraint of the vertical, hierarchical structure of administrations at all levels in most countries, that has to be overcome to allow a broadly understood *One Health* approach at the policy level. Communication needs to be improved between scientists, policy makers and the public but business industry also has to be involved. A clear mission statement is needed and a common language has to be found *(e.g. what is meant by prevention?)*. Also, both representatives of the EC emphasized that social science is too often neglected and that evidence-based values must include social values. Biodiversity preservation and its sustainable utilisation, in particular for purposes that include health, is favoured by various legislations and initiatives from DG Environment and DG Research & Innovation. Health is implicitly included in all sectors, and the *One Health* concept

From left to right: Ladislav Miko, Lucette Flandroy and Sophie Vandewoestijne

was recognised and adopted as an integrated vision by the EU after the last major *avian influenza* epidemic. *DG Health* is thus now based on the *One Health* principle. Projects and plans, around the *One Health* and *EcoHealth* concepts now exist at the level of the *European Commission*, but are still located in separate DGs *(Health, Agriculture, Environment, and Research & Innovation)*. The legal basis is there but the principle is too narrowly understood and implemented. For instance, as Mr Ladislav Miko stated, some issues, such as soil health, are still neglected when they should be taken on board of a *OneHealth/EcoHealth* approach. The misunderstanding may come from the fact that the concept is new not only to authorities but also to most of the population. The general public should be educated on this integrated health vision to ensure behavioural changes.

TOPICAL SESSIONS

In the topical sessions, specialists exchanged experiences from their sectors and projects, whilst addressing reasons and ways to apply the *OneHealth* perspective in their respective fields of expertise. The topical sessions focused on health risks *(Vectors and vector borne diseases, Zoonotic diseases, Cross-pollinating agro-eco-human health perspectives to reduce antimicrobial resistance (AMR) threats)* and on health benefits *(Environmental and internal microbiome, Nature health benefits)*. The diversity of issues addressed in the workshop were selected to be reflective of the diversity of thematic areas addressed in the *CBD – WHO State of Knowledge Review*. It was noted by participants that such a broad range of cross-sectoral issues tends to be uncommon in expert meetings, particularly among expert communities that tackle health benefits or rather risks from biodiversity, as these still tend to be discussed in different fora. Inherent to the *One Health/ EcoHealth* perspective, several links can be identified between the topical sessions :

- Based on a better integrated knowledge on the biology/ ecology of vectors and pathogens, the *One Health/ EcoHealth* approach should favour a preventive approach of vectorial and zoonotic diseases rather than current reactive initiatives. This would help reduce the consumption of antibiotics and pesticides; hence tackle the global issue of antibiotics resistance and of pesticides impacts on human health and biodiversity.
- As stated in the *Cross-pollinating agro-eco-human health perspectives session* focusing on the issue of antimicrobial resistance, there is a lack of data on the environmental dimension of the regulation of resistance. The *Environmental and internal microbiome session* tackled the role of *"good"* microbes in our defense against pathogens, and the impacts of various drugs and chemicals on this beneficial microbiota, including the transfer of antibiotic resistance genes to them. The role of and impacts on these "good" environmental and internal microbes should be further studied and taken into account in the problematic of antimicrobial resistance.
- Regarding the beneficial effects of contacts with nature in urban areas on human physical and mental health, the precise role of the environmental microbiome should be scrutinised.
- More integrated studies are necessary to define what is a healthy ecosystem and what is the equilibrium state *–depending on the type of ecosystem–* that allow micro- and macro-life to live in harmony. The place and inter-connecting role of the microbial world should not be neglected in programmes of biodiversity preservation and land planning in a *OneHealth/ EcoHealth* perspective.

Parallel sessions were held on:

1. Evaluation and challenges/ limitations of *One Health.*
2. Social science, transdisciplinarity and traditional knowledge systems.
3. *One Health/ EcoHealth* in the Global South: interdisciplinarity building in research and educational challenges.

VECTORS AND VECTOR BORNE DISEASES SESSION

INTRODUCTION TO THE SESSION

The Vectors and vector borne diseases session was coordinated by Nick De Regge (CODA-CERVA), Isra Deblauwe *(Institute of Tropical Medicine Antwerp)* and Steven Van Gucht (WIV-ISP). It focused on the complex transmission cycle used in our interacting living world by some microbes and other organisms, involving various hosts for their survival, reproduction and spread. This is the case for what we call vector borne diseases (VBD). Such pathogens are transferred between hosts by invertebrate vectors that do not suffer from their presence but they (occasionally) cause harmful effects to their human and/or animal host. Current environmental changes linked to human activities (*inter alia* climate change, landscape changes) together with increased globalisation and the use of antimicrobial products and insecticides can rapidly change the distribution, composition, abundance and dynamics of pathogens and vectors. This can result in changes at the pathogen -vector- host interface and could potentially be accompanied by changes in host spectrum and pathogen virulence. The session illustrated these changes through actual examples and discussed how this evolution requires to develop or adapt monitoring and management plans towards vectors and VBD, in particular in Belgium and Europe but also through *One Health*/EcoHealth approaches on the field in developing countries, and through adequate and coherent international collaboration of concerned actors in different sectors.

MAIN DISCUSSION OUTCOMES

Research: Surveillance and control of vectors and vector-borne diseases is a very broad, complex and multi-disciplinary domain. Indeed, all vectors and diseases have their own peculiarities and no unique solution is available to tackle all of them. Therefore, researchers should try to define priorities more clearly and work together with policy makers to define clear goals for surveillance activities.

Impression from the session

Policy: Policy makers should be aware that vector-borne diseases are an important upcoming threat and that there is not only an urgent need for permanent and structured surveillance programmes, but also for a clear control policy with protocols that allow immediate action and availability of the necessary control products. Being pro-active, and not to wait for an autochthonous spread of a vector-borne disease of human importance to react is crucial.

Field/ practice: There is a need for an improved collaboration and communication between different stakeholders, such as medical doctors, veterinarians, entomologists, researchers, policy makers, etc.

MORE INFORMATION

For a more extensive session report please visit the session page on the workshop website.

ZOONOTIC DISEASES SESSION

INTRODUCTION TO THE SESSION

The Zoonotic diseases session was coordinated by Marcella Mori (CODA-CERVA) and Javiera Rebolledo (WIV-ISP). The session focused on how people interact with animals in their daily lives. We raise animals for food and keep them in our homes as pets. As the current human population continues to grow, these interactions become more and more important due to the fact that humans invade more and more the territory/ habitat of wildlife. Increasing movements of people, as well as an increased trade in animals and animal products is also one of the factors that may account for new emerging zoonoses. Zoonoses, or zoonotic diseases, are caused by infectious agents that are transmissible under natural circumstances from vertebrate animals to humans. Zoonoses may arise from wild or domestic animals or from products of animal origin. They have been described since early historical times. At least 60 percent of all human pathogens are zoonotic, according to the *Centers for Disease Control and Prevention* (CDC), and 75 percent of recently emerging infectious diseases that affect humans are of animal origin. Besides the link between human and animal health/ disease and their common drivers, other human factors can influence the management of zoonoses and should be taken into account in a *One Health*/EcoHealth view. The WHO describes over 200 zoonotic diseases.

In this particular session, the scientific developments were discussed with an integrated view of some important zoonosis (Non-food borne zoonotic diseases). The current means of monitoring and management together with the needs for future were also examined.

MAIN DISCUSSION OUTCOMES

A clear definition of what is included under 'zoonotic diseases' (of animal origin or contracted from animal or man-made zoonotic disease) is needed to tailor and tackle proper needs, that once identified, will lead to targeted scale of action. Working in networks is also

Impression from the session

necessary, in order to involve all stakeholders, including the general public. Working together has to be well identified under a common language, in particular because results of research on zoonoses are often jeopardised by institutional/ private/ country interests.

It is important to try to work on a proactive/ preventive perspective rather than a reactive one, when epidemics have already risen. Prioritisation of diseases is an option currently explored by stakeholders but it is not shared as the best option within the scientific community. Support should be devoted to early warning diagnostic tools (pen-side/ bed-side test), possibly multiplexed, together with initiatives to understand the biology of pathogens, their ecology, the relationship of the pathogen with the host and the host immune responses.

MORE INFORMATION

For a more extensive session report please visit the session page on the workshop website.

CROSS-POLLINATING AGRO-ECO-HUMAN HEALTH PERSPECTIVES TO REDUCE ANTIMICROBIAL RESISTANCE (AMR) THREATS SESSION

INTRODUCTION TO THE SESSION

The Cross-pollinating agro-eco-human health perspectives to reduce antimicrobial resistance (AMR) threats session was coordinated by Wim Hiemstra (ETC Foundation) and Aurélie Binot (CIRAD). The session focused on the global threat of antimicrobial resistance (AMR) which poses an important challenge for human, animal and environmental health experts and practitioners to overcome disciplinary silos and speed up understanding and action towards a *One Health/ EcoHealth* approach and practice. The session aimed at having a dialogue about current scientific understanding of AMR, antibiotic resistance (ABR) and experience from practice in fighting antibiotic resistance. In the morning session, three presenters reflected on how the human, animal, environmental streams of information on AMR-ABR were brought together in a practical way, thus presenting a systems perspective. The afternoon session deepened presenters' and participants' experiences to identify pitfalls and potentials for collaboration for a *One Health/ EcoHealth* approach and practice.

MAIN DISCUSSION OUTCOMES

The session highlighted some priority actions to be conducted in order to better manage AMR in a *One Health/ EcoHealth* approach:

- Setting up research programmes in order to conduct in-depth stakeholders analysis *(as an interactions diagram showed that stakeholders were very diverse and did not fit in "generic boxes" but need in-depth analysis of the specific stakes at play, their practices and social networking)* and process analysis *(e.g. resilience of socio-ecosystems, agrarian diagnostic, etc.).*
- Identifying and documenting processes at play: resistance, mutation, immunity, resilience, trade, communication, education, knowledge sharing, regulation.
- Strengthening the environmental dimension in AMR management: better understanding of socio-ecosystem's dynamics, ecological functions and services involved in the regulation of resistance.
- Strengthening economic dimension: better understand actors' practices and socioeconomics rationales.
- Improving data collection, management and sharing to increase interoperability.
- Improving communication and networking.
- Strengthening networking *(policy science interface, universities alumni, OH students networks, networking between researchers, decision makers and civil society to better address societal demand).*

Impression from the session

MORE INFORMATION

For a more extensive session report please visit the session page on the workshop website.

ENVIRONMENTAL AND INTERNAL MICROBIOME SESSION

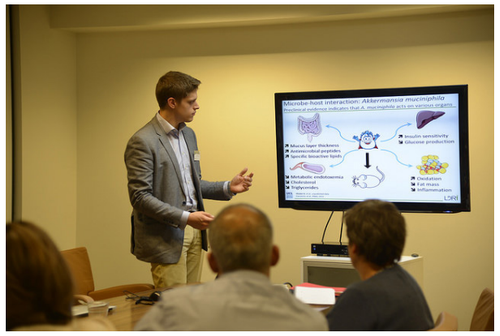
INTRODUCTION TO THE SESSION

The session on Environmental and internal microbiome was coordinated by Lucette Flandroy (FPSH) and Ellen Decaestecker (KULeuven). The session aimed at discussing the effects of environmental, food-grade and commensal microbes on human, animal and plant health, in an integrative approach, in order to identify links between environmental and internal microbiome with human health and disease. The session largely focused on:

- the effects of gut bacteria on human health through the activation of interrelated physiological systems
- the role of the microbiome on the host adaptation and evolution in its natural environment
- the extent to which influences of genetics and environment may affect the internal human microbiome
- the impact of various lifestyle factors, including diet, pharmaceutical products consumption and exposure to environmental chemical substances on the gut microbiome
- the similarities and correlations between functions of human, animal, and plant microbiomes
- the importance of microbial biodiversity for human health in the context of the interlinked environmental and internal microbiome
- the need for medical, nutritional, environmental, agricultural, land use planning, architectural and social interventions aiming at increasing microbial biodiversity in the environment and human exposure to beneficial microbes
- policy recommendations.

MAIN DISCUSSION OUTCOMES

Accumulating evidence suggests that host health (would it be human, animal or plant) is deeply influenced by its microbiota that constitutes a complementary genome. To solidify these initial data, more interdisciplinary research is still necessary to unravel the role of host genetics and environment (in a large sense) on the human microbiome. Understanding how environmental factors impact the human microbiome and health in the context of host genetics and defining the "healthy" microbiome along these lines, may revolutionise disease prevention and therapy. Integration of different concerned policy sectors should favour interdisciplinary research studies, at best at transnational level (wide epidemiological covering). Policy makers should also support public information/ education towards a holistic vision of microbes and their potential positive connection with human health while avoiding compromising rational hygiene practices and medication in a time of infectious diseases (re-)emergence. The current knowledge on the importance of our internal microbiome composition for our health, and its relationship with the environment, is reinforcing the reasons why policy makers should further promote access to and contact with nature, with high biodiversity, especially in urban areas. Coherently with the *OneHealth/ EcoHealth* approach, healthy ecosystems may be key to



Impression from the session

disease prevention, and should be viewed as a fundamental pillar of cost-effective healthcare, especially in a time of economic and environmental crisis. Finally, it should be noted that research and implementation of knowledge on the microbiome could constitute an integrating living element between national and supra-national policies, such as EU policies, but can also contribute to an integrated implementation of several *Sustainable Development Goals* (SDGs) of the UN 2030 Agenda.

MORE INFORMATION

For a more extensive session report please visit the session page on the workshop website.

NATURE HEALTH BENEFITS SESSION

INTRODUCTION TO THE SESSION

The Nature health benefits session was coordinated by Sjerp de Vries (Wageningen University & Research) and Hans Keune (COPBH/BBPF). Nature benefits human health in many ways as the structure, notably biodiversity, and functions of nature underpin the provision of ecosystem goods and services such as food, air, energy, water, shelter, medicine, disease prevention and treatment, disaster-risk reduction and climate regulation. Often either the health benefits side is getting no or only limited attention in expert communities focusing on environment and health, or the health risks side is neglected. Experts in the *One Health* communities tend to focus on health risks such as vector-borne and other infectious diseases. Experts in the ecosystem services community tend to focus on the services, such as health benefits from urban green space or medicinal plants. In the original *One Health* and *EcoHealth* frameworks, such health benefits from nature are hardly taken into account. During the European *One Health*/EcoHealth Workshop, a session on Nature's health benefits was organised to not only illustrate the importance and diversity of benefits that nature contribute to health, but also the many challenges that practitioners, researchers, policy makers, and stakeholders face in public and ecosystem health.

MAIN DISCUSSION OUTCOMES

Given the current socio-political context, policy makers use valuation to prioritise and make choices given budget constraints. Economic valuation of complex systems, including nature, society, economy and health, as a basis for decision making is dangerous as it will not capture the complexity of natural systems, and aspects which are not taken into account tend to be ignored. Nevertheless, economic valuation of health benefits from engaging with nature, as well as attempts to prove and quantify the effects that might generate such value, can be useful points of departure for discussion with policy makers and others concerned on what they and others value and why, and how different also conflicting values could best be reconciled. Thus, evaluation with its limitations can be a heuristic tool in a process of dialogue and deliberation, especially when the limitations are explicated. Some grassroots initiatives have been successful because they are adapted to the local context and therefore need to be promoted. May governments adapt the constitution, e.g. as happened in Ecuador and New Zealand, to conserve nature and biodiversity?

Impression from the session

MORE INFORMATION

For a more extensive session report please visit the session page on the workshop website.

EVALUATION AND CHALLENGES/LIMITATIONS OF ONE HEALTH SESSION

INTRODUCTION TO THE SESSION

The Evaluation and challenges/limitations of One Health session, a dedicated session by the *Network for Evaluation of One Health* and coordinated by Barbara Häsler (Royal Veterinary College) and Simon Rüegg (University of Zurich), addressed the challenges and limitations of *One Health* as well as its growing enthusiasm. In the session both practical examples and theoretical frameworks were presented in order to discuss how we can measure what works and what does not work in *One Health* and how we can capture the added value to human, animals, society, and the environment. Worldwide recognition of *One Health* approaches for more effective protection of global animals and human populations from health threats in combination with environmental stewardship has not led to the systematic and sustained allocation of resources for integrated, systems-based health programmes. Currently available evaluation results are not usually comparable and are often based on assumptions and expert opinion rather than empirical data. This not only constrains decision-making, but also the innovation of data collection protocols and the development of databases to capture and quantify the value of interdisciplinary approaches. The session aimed to discuss the development and practical application of *One Health* over time and how its (added) value could be measured.

MAIN DISCUSSION OUTCOMES

- Key limitations to evaluation of integrated approaches to health: Defining the evaluation for the approach or the specific goals, finding the balance between rigidity and flexibility of evaluation and time scale trade-offs.
- Who would benefit most from evaluations of OH/EH or similar concepts and why? It was agreed that the ultimate beneficiary will be everyone. Intermediate beneficiaries are *One Health* implementers in order to assess whether they use the right tools to reach their goals.

Impression from the session

- Which form of expertise would be useful for *One Health* collaboration? The "translation" (i.e. adequate communication and dissemination mechanisms with language and delivery methods fit for purpose) of *One Health* concepts for a range of stakeholders is essential. This process of effective communication and initiation of systems thinking could be started early by introducing *One Health* in primary and academic education.
- What activities/steps are needed to create *One Health*/ Ecohealth evaluation capacity? There is little capacity of *One Health* and Ecohealth evaluation. There is a need to raise awareness about *One Health* and the necessity of evaluating it as well as the provision of training on evaluation of *One Health*/ Ecohealth and evaluation in general. To achieve this, it is recommendable to bring more professionals evaluators into the community.

MORE INFORMATION

For a more extensive session report please visit the session page on the workshop website.

SOCIAL SCIENCE, TRANSDISCIPLINARITY AND TRADITIONAL KNOWLEDGE SYSTEMS SESSION

INTRODUCTION TO THE SESSION

The session on 'Social science, transdisciplinarity and traditional knowledge systems', coordinated by Séverine Thys (ITM) and Hans Keune (COPBH/BBPF), addressed the role of social sciences in interdisciplinary and transdisciplinary research and science – interfacing with society and including lay and expert, traditional and new knowledge systems. This approach is gaining increasing support and attention in many fields of interest. In some, this is well established *(e.g. health and medicine, based also on structured knowledge brokering systems)*, whereas in other fields its development is more recent *(e.g. ecosystem services, wildlife management, environmental health, and, importantly, in the field of EcoHealth)*. In the field of *One Health*, there still seems much to gain by including the social sciences beyond the restricted role of addressing the deficit of public understanding of the concept. In the session: social science perspectives challenges, opportunities and barriers for and next steps for enhancing social science integration in *One Health/EcoHealth* practices were discussed.

MAIN DISCUSSION OUTCOMES

In *One Health/EcoHealth,* experts seem to mainly focus on the local level and the need to work in "the community". However, socio-anthropological research should be integrated at all levels and spheres (global, national etc.) where the *One Health/EcoHealth* movement is involved in, in order to challenge assumptions, which do not always reflect the social reality. Another challenge that was addressed in this session was complexity: most *One Health/EcoHealth* issues are complex in nature, both from a natural or health science perspective and from a social science perspective. The process of how to deal with this combined complexity, also from the scientific perspective, can be perceived as a social and normative process. The roles of social scientists should not be limited to communication to ease delivery and dissemination of pre-established knowledge (because there is a deficit of public understanding). Public health and, even more so, *One Health* by taking on human as well as non-human (including ecosystem) health, should be considered as a social practice because health and ecological behaviours are shaped by communities and their living environments. Some clear definitions on what is disciplinary, and what multi-, inter- and transdisciplinary research means are needed because most often these dimensions are mixed which can have a strong impact on how the social reality is described and interventions designed and implemented, often excluding the most vulnerable population. Because not every veterinary, medical professional or ecologist is able to do sociology in the field or interpret resultant data, a real expertise in the social sciences (defined broadly, including e.g. behavioural, legal and economic studies) and humanities is needed. Moreover, time, efforts, tools, guidance and other prerequisites are needed for continued education within the biomedical sciences on what other approaches can add, and in turn within the social sciences and humanities on what biomedical sciences can add.

Impression from the session

MORE INFORMATION

For a more extensive session report please visit the session page on the workshop website.

ONEHEALTH/ECOHEALTH IN THE GLOBAL SOUTH: INTERDISCIPLINARITY CAPACITY BUILDING IN RESEARCH AND EDUCATIONAL CHALLENGES SESSION

INTRODUCTION TO THE SESSION

The OneHealth/EcoHealth in the Global South: interdisciplinarity capacity building in research and educational challenges session was coordinated by Nicolas Antoine-Moussiaux (ULiège) and Maarten Vanhove (RBINS). *One Health* and *EcoHealth* approaches were first promoted in the Global South, where they still hold a crucial importance, raising diverse challenges from the high diversity of societal and environmental contexts. To prepare the future generation of *One Health* and *EcoHealth* practitioners for the Global South, many education and capacity-building initiatives are now developing. Also, while the *One Health* approach often focuses on the link between veterinary and medical sciences, these initiatives, tied to educational or research programs, strive to foster the needed inter- and transdisciplinarity. How do research and education programs in the Global South contribute to the building of these competences? And how then is the environmental component taken into account *(e.g. influence of anthropogenic change on human and animal health)*? This session presented educational experiences as well as environmental projects in the Global South or in the framework of North-South and South-South cooperation. It discussed the particular challenges posed by *One Health* and EcoHealth approaches in terms of field capacity building and longer education programs.

MAIN DISCUSSION OUTCOMES

Since the integration of human, animal and environmental health is a necessity inherent to any *One Health* approach, this holistic philosophy of integration should also be applied throughout *One Health* education. This goes against the usual silo organisation of science teaching, and represents an important challenge to education professionals. This session also highlighted the importance of capacity development (including monitoring, detection, pathogen identification) in the Global South and of the involvement of the Global South in general. A train-the-trainer approach is important and recommended. Also, to get the desired outreach, well beyond the number of people that could be trained through long master programs, this training of trainers should target specific needs through short-term, field-based education, such as so-called summer schools. It was suggested to create more opportunities to learn together (people from different disciplines) with the aim to foster collaborative work/research/education? The integrative approach should not only be part of health-related curricula, but should also be incorporated into economy, social sciences... It should also consider environmental and ecological dynamics which are often overlooked. Promoting the use of evidence-based innovative educational approaches, to document the benefits and further advocate the need for these approaches. This advocacy effort would be especially directed towards an audience of (life) scientists who may be unaware (and therefore sceptical) about the value of qualitative approaches or feel uncomfortable about the teaching of soft skills. It is recommended to find inspiration or case studies in a given country for best practice for documentation and diffusion.

Impression from the session

MORE INFORMATION

For a more extensive session report please visit the session page on the workshop website.

BREAK-OUT GROUP DISCUSSIONS ON INTEGRATION CHALLENGES

Building on a survey about *One Health* integration challenges organised as input for the workshop *(results presented by Hans Keune in the second plenary)*, five key integration challenges were identified:

1. Data integration
2. Interdisciplinary & cross-sectorial collaboration
3. Developing soft skills
4. Recognition of *One Health* actions and research
5. How can interdisciplinary/transdisciplinary research get published.

The participants of the workshop were divided in subgroups of about ten participants. For each of these five areas, the subgroups discussed potential solutions as well as potential "success indicators" to assess and monitor the improvements of the integrated approach. This exercise was developed and moderated by Barbara Häsler (Royal Veterinary College), Aurélie Binot (CIRAD), Wim Hiemstra (ETC Foundation), Séverine Thys (ITM) and Hans Keune (COPBH/BBPF). This part of the programme was closed with a brief reporting back.

Barbara Häsler reporting back to the plenary; next to her from left to right: Hans Keune, Aurélie Binot and Séverine Thys

1. DATA INTEGRATION

Key discussion questions proposed here were

a) How to setup linked databases dealing with heterogeneous data?
b) What are the alternatives to standardisation of data?
c) How to keep the necessary level of complexity, diversity and heterogeneity in data while modelling complex socio-ecosystems?

Participants brought up underlying questions of why data should be shared and pointed out that data sharing should not just be done for the sake of sharing data, but that it should be beneficial for all involved. They remarked that it is often difficult to decide which data should be shared, i.e. project specific or rather general data. In the discussions, three main theme crystallised; namely 1) data access challenges, 2) data quality; and 3) linking of databases.

With regards the **data access challenges**, participants pointed out that data ownership is often not clear-cut in interdisciplinary collaboration and that this may lead to tensions, as data ownership can be a competitive advantage. It was agreed that data exchange between well-collaborating scientists /consortia is usually not a problem, but relies on good working relationships and clear agreements which clearly define access and use so that the competitive advantage can be protected. It was recommended that some form of guidance on how to solve this in consortia would be beneficial. Because it takes time to set up these good working relationships, people should therefore – as a first step on the way to data sharing – establish relevant collaborations. Some people criticised the role of big organisations like the WHO that are gathering data centrally, but can sometimes be reluctant to share these data, even though these data are perceived to be public goods. They pointed out that these "big" organisations need to be reminded of their role and should be lobbied to make cleaned datasets publicly available and secure quality control.

With regards **data quality**, participants remarked that this is always an issue, as there are no perfect data and quality of data can be highly variable. They recommended that any user always must bear this in mind and adhere to established professional data quality standards. It was agreed that having good meta-data is key to understanding the data and making a judgment on quality and consequently an informed decision on their use. This was perceived to be a general data use/sharing challenge, a not necessarily a *One Health* challenge, even though there may be an additional level of difficulty due to differing professional standards. Users are advised to follow best practice when accessing such data and be prudent in use. Participants further observed that the accuracy of data can be more or less important depending on the

purpose. Consequently, users are encouraged to ask themselves what exactly they want to know, e.g. answer big picture questions or detailed questions?

When talking about **linking databases,** it was agreed that an important pre-requisite is to first harmonise data by sector and that sectors should spend time and effort into harmonisation and standardisation *("sectors need to do their homework")*. Ideally, sectors would talk to each other to avoid duplicating databases. When using or linking raw data *(not summarised or interpreted data)*, users should make sure to link those that have a similar structure to avoid linking apples with pears (e.g. OIE WAHID and GBIF). Participants also emphasised that the use of online databases can be very efficient and easy if they are set up in the right way and fit for purpose. Hence, it was recommended to promote access to web-based platforms and facilitate their use.

2. INTERDISCIPLINARY AND CROSS-SECTORIAL COLLABORATION

Key discussion questions proposed here were:

a) How to overcome the potential conflicts and gaps in knowledge across disciplines?

b) How to involve disciplinary institutions?

c) How to promote cross-sectorial collaborations among Environmental/natural resources management, public health, agriculture, rural development, land management sectors?

d) How to involve various types of stakeholders, intervening at different levels from local to transnational?

e) How to promote participatory processes? How to better articulate collective action and public actions?

Several concrete suggestions for enhancing collaboration were developed during this discussion group:

- Overcoming professional protectivity, in the human health sector in particular, by showing the mutual benefits of collaboration
- Pool your data & cooperate (analysis and publication)
- Education programmes across disciplines & early life education (children), education of other stakeholders (patients)
- Participation of all actors, overcoming change "hierarchy"
- Resources spent on integration
- Proper management
- Start with a specific problem with actors with a common goal
- Bottom-up is the driver
- Behavioural change - consumers -> industries
- Steering through democratic governance public-private partnerships towards fair, sustainable *One Health/ Eco Health*
- Interdisciplinarity of publications, references, contributions & citations
- Win-win situation based on clear service-level agreements
- Policy makers (EU-national-international-...) impose some decisions regarding *One Health/ Eco Health.*

In terms of capacity building (opportunities and threats), the need for build-up of more structural support capacity needed for typical complex *OneHealth/EcoHealth* issues was raised. Indeed, if one waits with organising such capacity until a crisis occurs for which such capacity is needed, is often ineffective and too late. A solution may be considered in creating a new, broader, more encompassing institution which incorporates the relevant disciplinary and sectorial elements. The disadvantage may nevertheless be that by creating such, one creates new boundaries for outsiders, and again limits involvement of and collaboration with groups that for whatever reason are not included at first instance. This then becomes a new barrier in such collaboration, which, even if unintentional, could be counterproductive. More flexible, open formats, such as e.g. a community of practice, but with structural support to being able to function properly, could be a better way forward. Regional expert clusters/networks close to policy makers and activity of people in a cluster were also proposed. Networks can benefit from or form a basis for data sharing. Joint projects are good examples.

In terms of indicators for interdisciplinary and cross-sectorial collaboration, it was discussed that

indicators could be the number of participants from different disciplines involved in the work. An interesting proposal for an indicator would be not so much on the outcomes side, but on the support side: how much resources, e.g. funding, are made available for such work/aims?

3. Developing soft skills

Key discussion questions proposed here were:

a) How to promote behavior and attitudes enabling an interdisciplinary framework?
b) How to smooth interest conflicts and power relationships among heterogeneous stakeholders?
c) How to manage conflicting points of view about complex *One Health* issues?
d) How to promote interdisciplinary leadership?

From this brainstorming group exercise, the skills related to communication were considered to be important. Learning the jargon (scientific language) of disciplines you attend to collaborate with, but also interpersonal communication and science and political communication to be able to communicate well with policy makers.

The skills related more to the management of the collaboration were also often mentioned such as listening abilities, leadership skills, adaptability competences, team management (team building), inclusiveness, problem-based learning and finally, psychological skills.

But what was perceived to be at stake in order to promote behavior and attitudes enabling interdisciplinary was to build first of all common goals and also common *One Health/ Eco Health* language (terminologies, concepts,...). It was indeed essential to make use of an innate biophilia in *One Health/ Eco Health* (having a positive attitude regarding *One Health/ Eco Health* approach), but also to recognise your own limitations, be reflexive and therefore acknowledge cultural sensitivity (e.g. by adopting nonverbal communication skills). Responsiveness, media literacy, management of information and argumentative skills were also part of the *One Health/ Eco Health* competencies set identified to be necessary to manage conflicting points of view about complex *One Health/ Eco Health*issues. Thinking out of the boxes and be creative were both very important skills to develop among the *One Health/ Eco Health* community.

Specific attitudes to include into *One Health/ Eco Health* competencies were flagged such as patience, flexibility, empathy, openness, tolerance, passion and ethics.

Finally, in term of knowledge, knowing the values and principles of others disciplines and their epistemology were something unavoidable to work together *(e.g. develop the ability to understand financial aspects when you are an anthropologist).*

Several remarks were raised by the participants during this group discussion. First of all these skills mentioned above are not only necessary for *One Health* but for any collaborative work and secondly they all referred to learning skills but what about teaching skills? In that sense, participants raised the need for more creativity, more applied courses and the use of new tools (e-learning, animation...) but also that actions are really needed in addition of education to create more meaning and challenging these new capacities learned in real life. *One Health/ Eco Health* soft skills should also be trained before being involved in our work/research, although it would be too late to change. As a final remark, a change of paradigm would be imperative to address *One Health/ Eco Health* learning challenges: Health (humans-animals-environment)/well-being oriented instead of diseases oriented.

4. Recognition of One Health actions and research

Key discussion questions proposed here were:

a) How to acknowledge the legitimacy of interdisciplinary/ cross-sectorial profiles and postures?
b) How to recognise the relevance of the process of building interdisciplinary/ cross-sector approach?
c) How to acknowledge that building an integrated framework is a research topic/ an intervention in itself?

Several indicators were brought forward:

- Funding available for interdisciplinary research
- More actors joining the *One Health/ Eco Health* community
- Research data are made known to more

stakeholder groups, e.g. through open data.

Several steps forward were proposed:

- Avoid misuses of *One Health* concept which harms recognition
- Bridge the gap between policy makers and scientists
- Focus scientific work on practical problems in real life and then involve scientists to help solving the problems with research
- If more people use *One Health/ Eco Health* terminology and labels, then there is more recognition
- If policy makers think in *One Health/ Eco Health* frameworks
- Create case studies with tangible benefits and impacts of *One Health/ Eco Health* approach –sometimes unexpected synergies an be shown; comparative case research
- Getting dis-aggregated data of social groups when doing assessments. In Bolivia, working with women especially helps because they are in charge of many health-related family activities
- Policy committees having members from *One Health/ Eco Health* sectors: animal, human, environment
- Clarify interrelations and then build linkages with scientific disciplines
- Get Board members who have a *One Health* concept in mind when they take decisions
- Green light from hierarchy to work on *One Health/ Eco Health*, even if it may take more time to show impact
- When *One Health/ Eco Health* concept is part of veterinary, medicine and environmental education systems. Need to build transdisciplinary *One Health/ Eco Health* curricula that also give accreditations.

5. How can interdisciplinary/ transdisciplinary research get published

Key discussion questions proposed here were:

a) How to promote scientific excellence while elaborating interdisciplinary research at individual and collective (institutional) level?

b) Interdisciplinary/transdisciplinary research has great difficulties in getting published in scientific journals

c) Especially in the most well-known and most prestigious journals.

The main problems that are faced while entering in the process of publishing *One Health/ Eco Health* research is that authors tend to always target the same audience with dedicated journals. Indeed, they face disciplines frontiers, that are shaping the editorial board and lead to rejection of the manuscripts. The group stated the same issue regarding projects funding, evaluation of proposals, as it seems not easy to set-up efficient interdisciplinary committees (several domains with their own protocols).

Throughout the discussions, the group proposed some solutions to overcome these issues:

- Taking leadership on editorial process (books, new journal etc.)
- Influencing editorial boards, setting-up lobbying strategies involving new types of actors from media, political side, civil society
- Identifying *"Champion researchers"* who should take responsibility in trying to influence editorial boards, and promoting interdisciplinary journals through increasing citations, research networks, invitation to conferences *(as not only Impact factors but also citations can have an impact)*
- Promoting social sciences research on transdisciplinarity as a research question in itself and a process to be documented
- Changing the target: not only high Impact Factors (IF) journals, because practitioners do not read that type of publications but sometimes other journals, with lower academic impact get a lot of citations.
- High IF publications matter notably when authors want to gain legitimacy regarding donors. Some IF publications are then still needed.
- Focusing also on the social impact of the research, developing a culture of impact assessment, valorising in the research system the impact of *One Health/ Eco Health* actions on policies etc.

Regarding the specific question of interdisciplinarity promotion, the participants raised the fact that it can be addressed in different ways regarding the institutions and also cultural area (better acknowledgment and recognition of interdisciplinarity in Anglo-Saxon

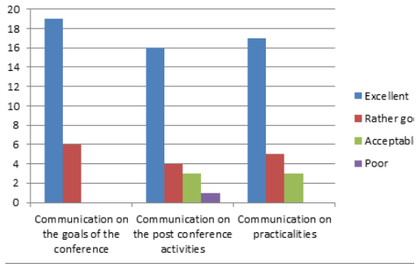
countries?). Interdisciplinarity can be promoted by involving persons from different disciplines in the committees for selection of researchers to be recruited or evaluation or of scientific papers.

As a conclusion, taking ownership of interdisciplinary work is a long process and calls for some innovations in team work and scientific career management.

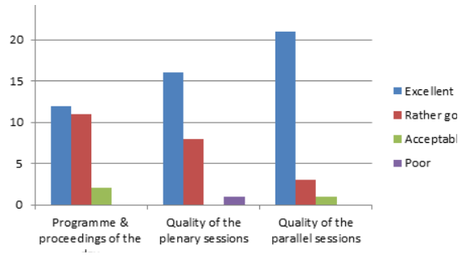
EVALUATION OF THE WORKSHOP BY PARTICIPANTS

Out of 125 participants, 26 completed the evaluation survey of the workshop. A general conclusion based on the responses to the evaluation survey and on individual communications about the workshop, is that many participants expressed very positive appreciation of the workshop.

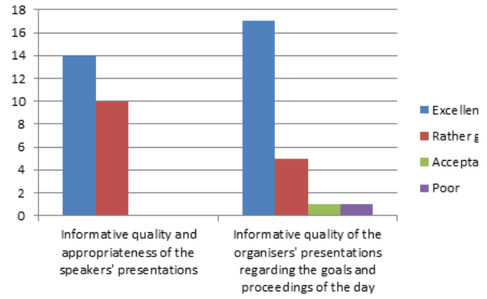
Most respondents were positive about communication about the workshop:



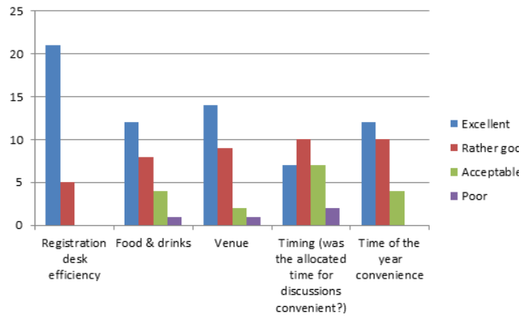
Most respondents were positive about quality of the program of the workshop. Especially the parallel sessions were highly appreciated.



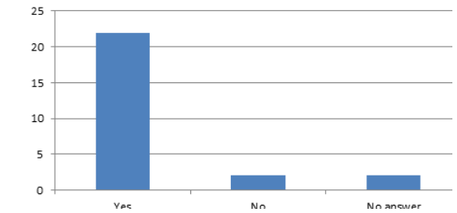
Most respondents were positive about the informative quality of the workshop. The presentations of experts were assessed rather good to excellent. The information from the side of the organisers was assessed very positive by most respondents.



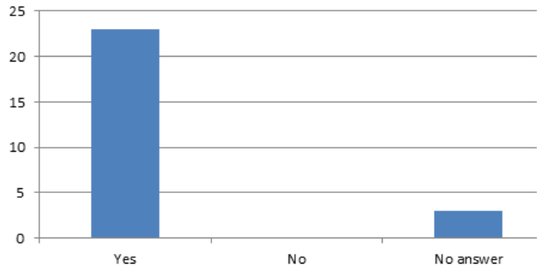
Most respondents were positive about organizational issues concerning the workshop (see below). Least positive was the feedback on timing allocated for discussions: this could have been better. Further the time of the year in which the workshop was organized was not fully satisfactory for all respondents.



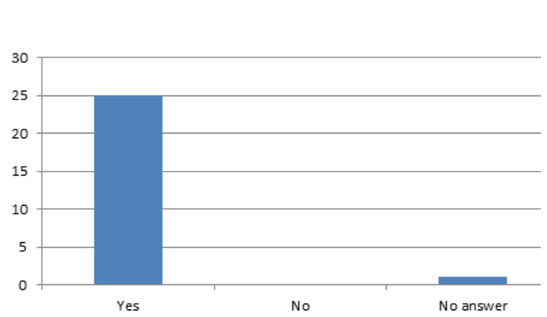
Most respondents were positive about gaining new insights during the workshop (21 out of 26; 2 answered negative, 2 did not answer).



Almost all respondents were positive about the opportunity to network during the workshop



Almost all respondents were positive about joining in an *European Community of Practice on OneHealth/EcoHealth*



Citation:
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