ONE HEALTH

THE LINK BETWEEN HUMANS, ANIMALS AND THE ENVIRONMENT FROM A PERSPECTIVE OF INTERDISCIPLINARY COMMUNICATION AND INNOVATIVE TEACHING

Stef BRONZWAER

5 May 2023 – UniParma
1. What is One Health
2. Global
3. EFSA - Europe
4. National
5. Case study - AMR
1. WHAT IS ONE HEALTH

Advancing One Health: Updated core competencies

Fig. 1. Two main streams of thought found in One Health: (i) One Health focusing on human-animal-plant-environment interfaces; and (ii) One Health focusing on the whole system encompassing humans, animals, plants and the environment. Credit: Dr. Juliette Blanc, CABI.

Fig. 2. The nine NECH updated competencies for One Health are grouped into three themes—Skills, Values and Attitudes, and Knowledge and Awareness.
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 inter-dependent.

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.
ONE HEALTH ACTORS

EFSA OH Operationalisation Task Force
Inter-Agency OH Task Force
EU Partnerships/ Europe
DG SANTE/AGRI/ENV
WHO/FAO/WOAH/UNEP
MEMBER STATES
MEMORANDUM OF UNDERSTANDING
BETWEEN
THE FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
AND
THE WORLD ORGANISATION FOR ANIMAL HEALTH
AND
THE WORLD HEALTH ORGANIZATION
AND
THE UNITED NATIONS ENVIRONMENT PROGRAMME
REGARDING
COOPERATION TO COMBAT HEALTH RISKS AT THE ANIMAL- HUMAN-ECOSYSTEMS INTERFACE IN THE CONTEXT OF THE “ONE HEALTH” APPROACH AND INCLUDING ANTIMICROBIAL RESISTANCE

Quadripartite Memorandum of Understanding (MoU) signed for a new era of One Health collaboration 29 April 2022
OH ACTION PLAN

ONE HEALTH QUADRIPARTITE
JOINT PLAN OF ACTION
(2022-2026)

WORKING TOGETHER FOR
THE HEALTH OF HUMANS, ANIMALS,
PLANTS AND THE ENVIRONMENT

1.2 Facilitate One Health capacity building, including workforce development in all relevant sectors

- Mapping of existing opportunities, resources and curricula at global, regional and national levels
- Definition of access and selection criteria and processes; evaluation of capacity-building programmes
- Mechanisms to build synergies and avoid duplication in capacity-building delivery
- Competency-based frameworks, training programmes, courses, plans and e-learning resources
- Workforce development tools
- Job descriptions for One Health professionals
- Simulation exercises to build and strengthen One Health competencies
- Monitoring and evaluation tools to assess capacity building

1.3 Support and promote the next generation of One Health practitioners, researchers and technical officers

- Internships, placements, mentorship schemes and a competency framework for junior One Health practitioners, researchers and technical officers

FIGURE 2: OVERVIEW OF THE THEORY OF CHANGE FOR THE OH JPA

1. PATHWAYS OF CHANGE

- Pathway 1. Policy, legislation, advocacy, and financing
- Pathway 2. Organisational development, implementation and sectoral integration
- Pathway 3. Data, evidence and knowledge

3. ACTION TRACKS (AT)

AT 1.2 Strengthen policy frameworks for the control and prevention of zoonotic diseases
AT 1.3 Increase political commitment and investment for control of neglected zoonotic diseases

AT 1.4 Strengthen global and regional initiatives to influence and support One Health responses to AMR

AT 2.1 Advance mechanisms, tools, and capacities to establish a One Health competent workforce and integrate One Health perspectives

AT 5.3 Strengthen global governance and surveillance for AMR

AT 6.1 Protect, restore and sustain ecosystems and environmental degradation

AT 6.3 Integrate environmental knowledge, data and evidence in decision-making

AT 7.2 Improve food system data and analysis, scientific evidence, risk assessment

AT 7.3 Increase the adoption of One Health approach in food safety, surveillance systems and research

AT 8.1 Enhance One Health approach to national food control systems and food safety coordination

AT 8.3 Strengthen One Health competence, early warning and response

AT 8.4 Strengthen One Health approach to national food control systems and food safety coordination
Action 6.4. Create an interoperable One Health academic and in-service training programmes for environmental, medical, agricultural and veterinary sector professionals

6.4.3 Develop an interoperable One Health training course (FTP-WEBE) for in-service professionals - a complement to the Field Epidemiology Training Programme (FETP), Field Epidemiology and Laboratory Training Programme (FELTP) – targeting professionals in ministries responsible for natural resource management (wildlife, biodiversity, ecosystems, environment), climate and other environmental issues

- Interoperable environmental sector One Health training modules and course developed
- Interoperable environmental sector One Health training delivered on biodiversity, ecosystems and wildlife
- Environment sector professionals understand how to contribute to One Health at national and subnational level
- Environment sector has the capacity to influence One Health policy and identify and implement environmental sector priorities as part of national and subnational One Health programmes
- National One Health policies and priorities reflect the mandates and interests of environment ministries and are expanded beyond zoonoses, AMR and food safety

AT 6, action 4

- FT-WEBE and FETP
- FETPV and In-Service Applied Veterinary Epidemiology Training (ISAVET)
- Needs Assessment and impact assessment tools, for example for national wildlife health programmes and country assessments of environmental health services (currently being piloted)
- FAO Virtual Learning Center training courses
- Introductory One Health Training course (7 technical modules) – FAO Regional Office for Asia and the Pacific Virtual Learning Center
- Global Framework for Transboundary Animal Diseases (GF-TADs)
- FAO manuals on highly pathogenic avian influenza (FAO, 2013a; 2013b; FAO and OIE, 2008), bats (FAO, 2011b) and other technical subjects (see, for example, FAO, 2019b; 2021e; 2021f)
- WHO/WOAH One Health workforce initiative
- WOAH/OIE National Focal Point for Wildlife training cycles & manuals
- The Tripartite One Health FETP Competency Framework
TRIPARTITE ONE HEALTH FETP COMPETENCY FRAMEWORK

- No internationally accepted competencies for epidemiologists
- graduates with varying competence and the dilution of the reputation of Field Epidemiology Training Program (FETP) or Field Epidemiology Training Program for Veterinarians (FETPV) certification.
- WHO, FAO and WOAH developed field epidemiology competencies in a One Health context
  - for reference and use by countries and regions
  - planning / reviewing a One Health FETP at the frontline, intermediate and/or advanced levels.
Regulation (EC) No 178/2002 - mission European Food Safety Authority:

The Authority shall contribute to a high level of protection of human life and health, and in this respect take account of animal health and welfare, plant health and the environment ...
Occurrence of foodborne outbreaks in 2021

In 2021, all EU Member States and United Kingdom (Northern Ireland) reported foodborne outbreak data to EFSA, with the exception of Bulgaria and Cyprus, which reported zero outbreaks. In addition, seven non-Member States countries (Bosnia and Herzegovina, Iceland, Montenegro, Norway, Republic of North Macedonia, Serbia, Switzerland) reported 83 outbreaks, 1,270 human cases, 65 hospitalisations and 2 deaths.

Overall, at the EU level, despite the number of foodborne outbreaks occurred at ENHR to ENHR rise slightly from 5 to 6 per million population, the number of human cases reported per million population dropped by 31% from 6.2 to 4.3 per million population.
EFSA OH – STORY MAPS – DASHBOARDS - OVERVIEW
HTTPS://WWW.EFSA.EUROPA.EU/EN/RESOURCES/DATA-

Reporting tools
- Excel mapping tools for 2022 zoonoses and AMR data reporting
- Instructions on how to use the Excel mapping tools can be found in the User manual for mapping on EFSA Member State zoonoses standard terminology to EFSA standard terminology for information derived from the year 2018

The catalogues extracted in the Excel format
- Catalogues for 2022 zoonoses data reporting
- The 2022 mapping between the ZOO_CAT. MATRIX and the FoodExt and examples of prevalence data reported in SSD2 format

Links to the annual reports
- National zoonoses country reports

Dashboards and story maps
Foodborne outbreaks
- Foodborne outbreaks dashboard
- Foodborne outbreaks story map

Prevalence
- Salmonella dashboard
- Salmonella story map
- Listeria dashboard
- Listeria monocytogenes story map
- Campylobacter dashboard
- Campylobacter story map

Antimicrobial resistance
- Monitoring antimicrobial resistance
- Monitoring AMR in Escherichia coli
- Dashboard on indicators of antimicrobial resistance
ONE CONFERENCE CONCLUSIONS

• Application of OH principles to food safety and nutrition help to deliver more integrated, cross-sectoral and collaborative health assessments.

• Such health assessments would better inform policies that support the transition towards a sustainable and resilient food system.

• It is not sufficient to merely acknowledge the concept of One Health, it will need to be applied!

• In recent years, EFSA with other EU Agencies, have applied One Health principles in the areas of zoonoses, AMR and bee health. Moreover, they have extended this approach to other areas (e.g. environmental risk assessment).

• Since EFSA and Member States have access to extensive transdisciplinary data, scientific knowledge and expertise, by deepening their cooperation they could effectively contribute to the development and implementation of One Health policies along the entire food chain.
THE ENVIRONMENTAL IMPACT OF FOOD

• **Food** is one of the main drivers of environmental impacts

• **Agriculture** is the highest contributor on most of the impact categories of food

• **Food of animal origin** drives the high environmental impact of agriculture

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Castellani V., Fusi A. & Sala S. *Consumer Footprint Basket of Products indicator on Food.* (European Commission, 2017)
ONE CONFERENCE

One Health (OH)

- Keep up with latest developments in science & technology
- Apply OH approach
- Invest in future preparedness
- Team up with food safety actors across the EU & beyond
- Increase relevance to society

Safe food

Support transition to sustainable food systems

Sustainable food
Workplan 2024 - 2026

Four priority areas
CAPACITY BUILDING - HTTPS://WWW.EFSA.EUROPA.EU/EN/ENGAGE/CAREERS

Staff
Work for us

Experts
Contribute to our scientific work

Secondments
Join us and enhance our partnerships

Young professionals
Be one of our next trainees

EU-FORA
Increase your knowledge in risk assessment through our fellowship program

Fields in which EFSA needs ISA EXPERTS
- Ecology
- Regulatory Science
- Chemistry
- Epidemiology
- Human medicine
- Toxicology
- Genetics
- Pharmacology
- Social Science
- Mathematics
- Plant Sciences
- Veterinary Science
- Food / Feed Technology
- Human nutrition

Tasks on which ISA EXPERT gives advice
- Provide preliminary completeness check of dossiers
- Provide advice in relation to risk assessment (e.g. literature analysis, systematic review, supporting an expert knowledge elicitation)
- Data validation, data extraction, data appraisal, collation and processing, summarising and analysis
- Support the design of social research
- Generation of insights to ensure quality throughout EFSA risk communication (audience-first approach)
- A full list of tasks can be found here

WHO CAN APPLY
Any individual (natural persons) with the required scientific profile
Citizens of a member state of EU or EFTA or an EU Candidate country
Citizens from third countries may also apply

REMUNERATION
Individual experts are remunerated with a fixed fee of €360 per day.
Maximum amount that can be paid to an individual expert during the whole duration of the call (5 years) is €140,000
EU-FORA – The European Food Risk Assessment Fellowship Programme

The European Food Risk Assessment (EU-FORA) Fellowship Programme is a key initiative for ensuring preparedness for future risk analysis needs. The programme keeps evolving based on six years of experience, the implementation of 94 work programmes, and the participation of more than 70 supervisors from 40 organisations in 16 different EU Member States and the UK.

- Offering a work programme to a fellow from another Article 36 organisation.

and / or

- Identifying among their staff a fellow to be trained by a partnering organisation (hosting site);

Training

Training is an essential part of the EU-FORA programme.

At the summer workshop and induction training, fellows meet and exchange experiences while being introduced to the topics they will tackle over the coming year.

Throughout the programme, fellows have the opportunity to follow seminars – physically and remotely – on topics such as risk assessment, emerging risks, risk communication or data collection.
Ongoing

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Circular economy / urban farming, may drive risks. For example:

a. Reusage Waste Water
b. Urban agriculture

Microplastics environmental concern since long - also possible food safety risk.
EUROPEAN GREEN DEAL

- Launched in 2019
- Interconnected policy initiatives
- Action plan make EU more sustainable
  - Efficient use of resources
  - Clean, circular economy
  - Restore biodiversity
  - Cut pollution
- Different policy areas
  - Biodiversity Strategy for 2030
  - Chemicals Strategy for Sustainability
  - Farm to Fork Strategy
LEGISLATIVE FRAMEWORK


• Having regard to the Treaty establishing the European Community, and in particular Articles 37, 95, 133 and Article 152(4)(b) thereof,

• Article 152(4). The Council, ... shall contribute to the achievement of the objectives .... (b) ..., measures in the veterinary and phytosanitary fields which have as their direct objective the protection of public health (c) incentive measures designed to protect and improve human health, excluding any harmonisation of the laws and regulations of the Member States....

• 5. Community action in the field of public health shall fully respect the responsibilities of the Member States for the organisation and delivery of health services and medical care.
Article 5 Union prevention, preparedness and response plan

- (f) the health preparedness and response and multi-sectoral collaboration, such as identifying risk factors for disease transmission and the associated disease burden, including social, economic and environmental determinants, following the One Health approach for zoonotic, food and waterborne diseases and relevant other diseases and related special health issues;

Article 11 Training of healthcare staff and public health staff

- 1. The Commission may organise training activities, in close cooperation with the relevant Union agencies and bodies and professional health organisations and patient organisations, for healthcare staff, social service staff and public health staff in the Member States, in particular interdisciplinary One Health training, including on preparedness capacities under the IHR.

Article 20 Public health risk assessment

- 1. Where an alert is notified ..., the Commission shall, ..., make promptly available ..., a risk assessment of the potential severity of the threat to public health, including possible public health measures. That risk assessment shall be carried out by one or more of the following Union agencies or bodies: ECDC, EMA, EFSA, ECHA, EEA, EMCDDA, ...
EUROPEAN PARTNERSHIPS IN CONTEXT.....

PARC
One Health
AMR
PAHW
SFS
4. NATIONAL - ONE HEALTH EUROPEAN JOINT PROGRAMME (OHEJP)

https://onehealthejp.eu/

KEY DOCUMENTS
- OHEJP SCIENTIFIC ACTIVITIES
- OHEJP OVERVIEW BROCHURE
- PUBLIC DELIVERABLES
- STAKEHOLDER ANALYSIS OF OUTCOMES OF EJP'S OUTPUTS (FEB 2023)
- PUBLICATIONS

SCIENCE TO POLICY TRANSLATION
- REPORTS
- ONE HEALTH EJP CONFERENCE 2023
- OHEJP OUTCOME INVENTORY
- DATA MANAGEMENT

ANNUAL REPORTS
- OHEJP ANNUAL REPORT 2018
- OHEJP ANNUAL REPORT 2019
- OHEJP ANNUAL REPORT 2020
- OHEJP ANNUAL REPORT 2021

ANNUAL SCIENTIFIC MEETINGS
- ASM 2019
- ASM 2020
- ASM 2021
- ASM 2022

WORKSHOPS
- ASM SATELLITE WORKSHOP 2019
- INTEGRATED APPROACHES TO ZOONOSES WORKSHOP
- ASM SATELLITE WORKSHOP 2021
- ASM SATELLITE WORKSHOP 2022
- COMMUNICATION AND MEDIA WORKSHOP

OHEJP SIMEX 2022

https://explore.openaire.eu/search/project?projectId=corda__h2020::ad3bed331601f46182a10ba919857c8b
5. ONE HEALTH CASE STUDY – ANTIMICROBIAL RESISTANCE (AMR)
BACTERIA READILY EXCHANGE INFORMATION ...

Defense possible by
- Closing-up?
- Cooperation

The Sapiens secret of success is large-scale flexible cooperation.
Yuval Noah Harari
Mean Proportions of invasive isolates of *S. pneumoniae* resistant to penicillin (PNSP) among 12 European countries, 1998-99
Consumption of antibiotics: Cars “Outpatient antibiotic sales in 1997 in the EU. Lancet 2001”
Beta lactam usage vs. logodds of PNSP resistance

\[ r^2 = 0.80 \]

P-value = 0.0002

CONSUMPTION OF ANTIBIOTICS IN HUMANS AND FOOD-PRODUCING ANIMALS, EU/EEA (POPULATION-WEIGHTED MEAN), 2014-2018

Population-weighted mean of the total consumption of antibiotics in humans and food-producing animals in 27 EU/EEA countries for which data were available for both humans and animals, for 2014-2018.

Note: for humans: ATC J01 Antibiotics for systemic use; for food-producing animals: ATCvet Q01BA, Q507A, O100A, O603A, O606A, O609A, O611E, O611J, O612A, O615, Q501, Q505, Q515. Population-weighted mean of 27 EU/EEA countries for which data were available: Austria, Belgium, Bulgaria, Croatia, Cyprus, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom.

Source: EÚCD, EFSA, EMA (2022).
ANTIBIOTIC USE IN ANIMALS DECREASED OVER TIME
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