IMAGE: PXHERE

Annual Report 2019

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INTRODUCTION

VISION

STRUCTURE

ACHIEVEMENTS

OUTCOMES

DISSEMINATION

EDUCATION

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IMAGE: PUBLICDOMAINPICTURES

WHAT IS THE ONE HEALTH EJP

The One Health European Joint Programme (OHEJP) is a landmark partnership between 37 public health, animal health and food institutes and the Med-Vet-Net Association, a European Network of Excellence for Zoonoses research, the OHEJP spans 19 different countries across Europe.

The One Health concept recognises that human health is tightly connected to the health of animals and the environment, therefore the study of infectious diseases that may cross species and environmental barriers is imperative.

The main focus of the OHEJP is to reinforce collaboration between institutes by enhancing collaboration and integration of activities by means of dedicated Joint Research Projects (JRPs), Joint Integrative Projects (JIPs) and through education and training in the fields of Foodborne Zoonoses, Antimicrobial Resistance and Emerging Threats.

Through the OHEJP there are opportunities for harmonisation of approaches, methodologies, databases and procedures for the assessment and management of foodborne hazards, emerging threats and antimicrobial resistance across Europe, which will improve the quality and compatibility of shared information for decision making.

OUR OBJECTIVES

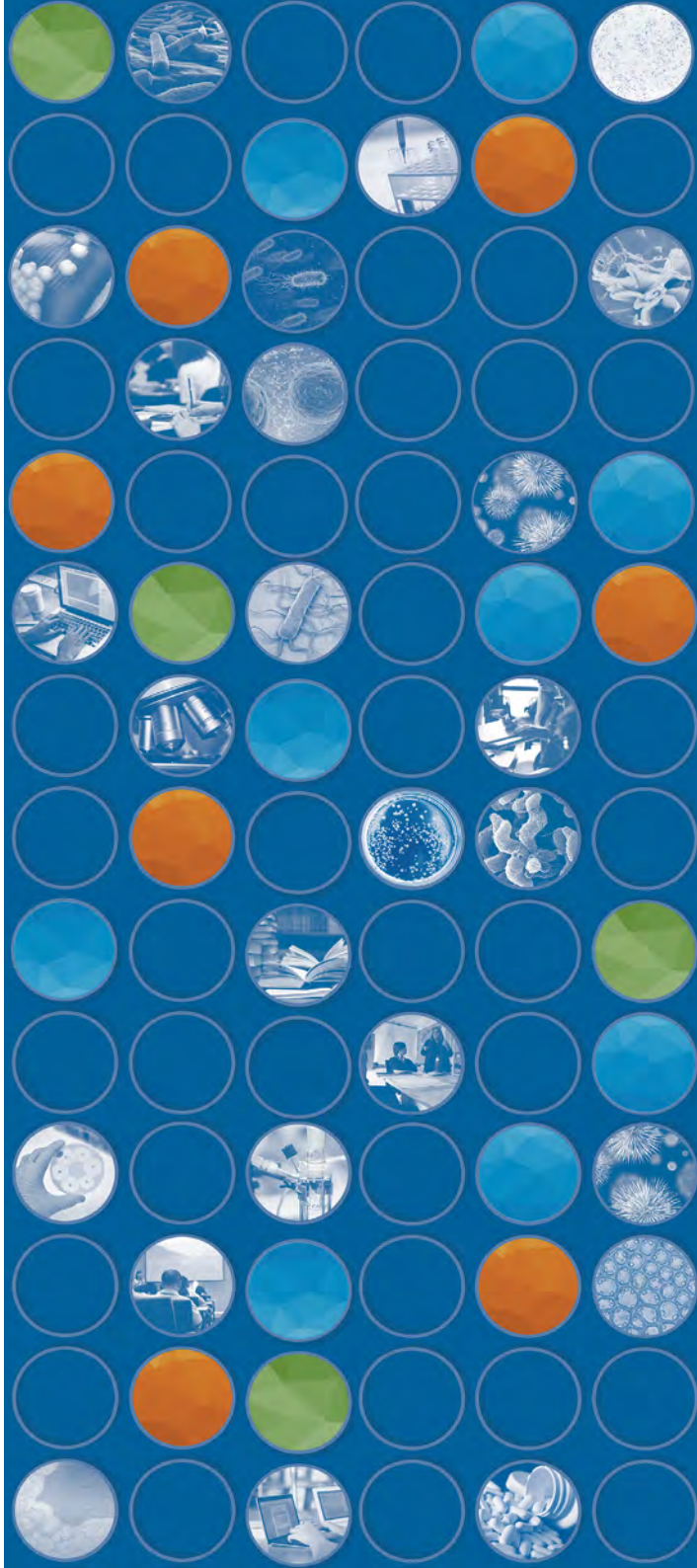
The overarching objective of the OHEJP is to develop a collaborative European network of public research institutes with reference laboratory functions.

A key aim of the OHEJP is to integrate medical, veterinary and food scientists to address three key research topics: foodborne pathogens, antimicrobial resistance and emerging infectious disease threats.

Public health concerns of consumers and other stakeholders are also at the forefront of the consortium's focus.

Key objectives:

- To bring together the major representatives of European scientific communities with expertise in foodborne zoonoses, antimicrobial resistance and emerging threats.
- To implement scientific integrative and collaborative projects related to the prevention of foodborne pathogens, antimicrobial resistance and emerging threats.
- To stimulate scientific excellence by co-funding Joint Research Projects and Joint Integrative Projects that have the potential to enhance scientific knowledge and provide tools for disease surveillance at both the national and European level.
- To foster the harmonisation and standardisation of laboratory methods by bringing together scientific and technical expertise.
- To exchange and communicate with European and international stakeholders, first and foremost with the European Centre for Disease Control and Prevention (ECDC) and the European Food Safety Authority (EFSA).
- To promote and develop food safety research in the European Unions by training, education and communication both nationally and internationally.



CONSORTIUM STRUCTURE

A governing and management system was established at the beginning of the One Health EJP.

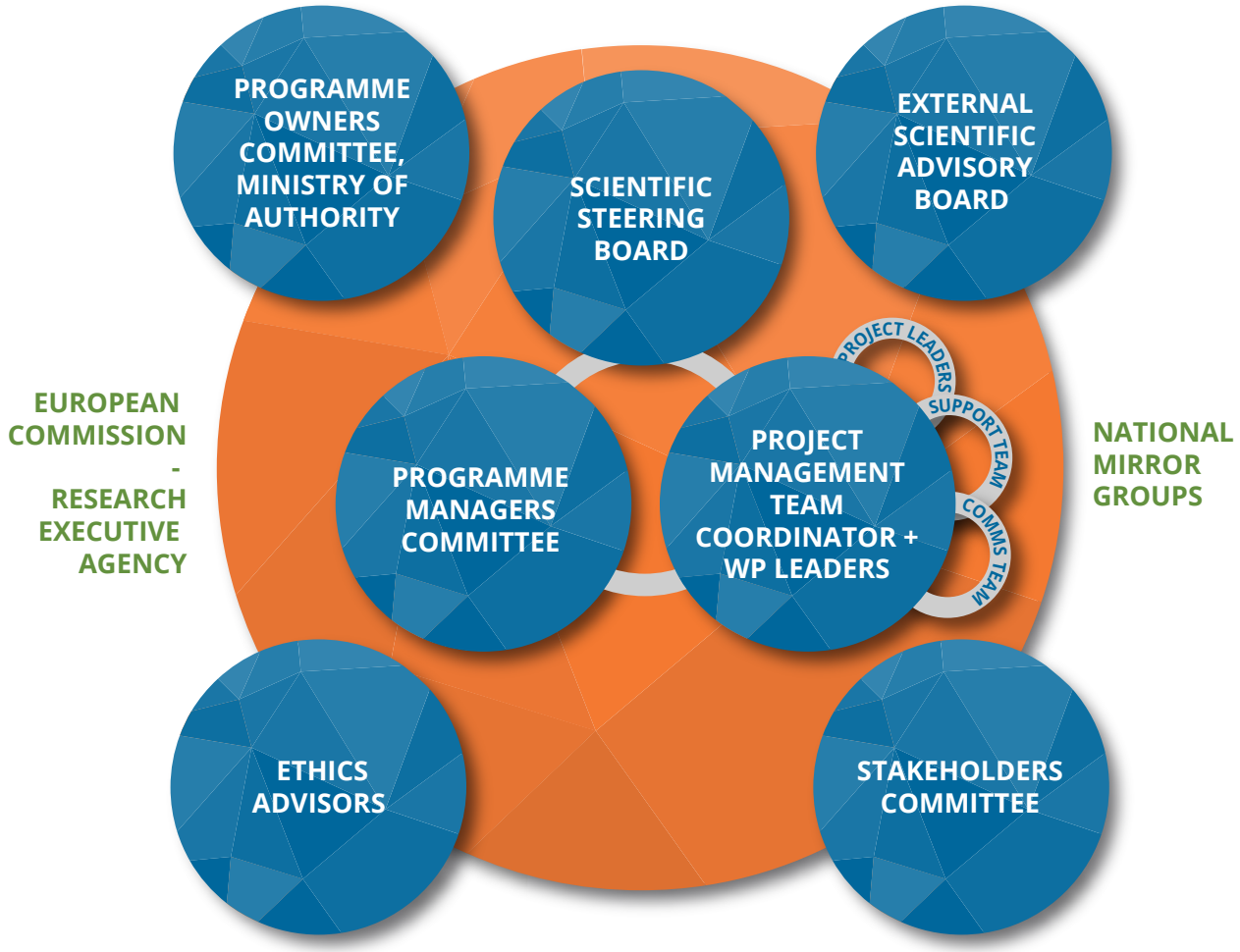
The governing boards specific to the OHEJP include: The Project Management Team (PMT), Scientific Steering Board (SSB) and Programme Managers Committee (PMC).

There are also important contributions from members outside of the OHEJP and these include: The Programme Owners Committee (POC), the External Scientific Advisory Board (ESAB), the Stakeholders Committee (SC), the Ethics Advisors and National Mirror Groups.

The OHEJP Coordination Team are based at the French Agency for Food, Environmental and Occupational Health & Safety (ANSES), France.

The OHEJP Scientific Coordinator resides at Sciensano, the Belgian Institute for Health.

The Project Management Team consists of all the Work Package (WP) Leaders and Deputy Leaders.



OUR STRUCTURE

The OHEJP consist of seven work packages, all are targeted towards specific overarching needs and objectives of the OHEJP. Each work package ensures the alignment and integration in the implementation of the project. Visit the One Health EJP website for more information about the different work packages.

Coordination - Work Package 1

WP1 enables the successful functioning of the OHEJP and maintains the environment where scientists can effectively and actively collaborate.

Strategic Research Agenda - Work Package 2

WP2 is responsible for the Integrative Strategic Research Agenda of the OHEJP, which identifies research and integrative priority topics aligning to stakeholder needs.

Joint Research Projects (JRPs) - Work Package 3

WP3 supports the Joint Research Projects which carry out jointly prioritised research projects and stimulate collaboration and harmonisation across the projects and partner institutes.

Joint Integrative Projects (JIPs) - Work Package 4

WP4 is responsible for organising selection, supervision and evaluation of the Joint Integrative Projects and stimulating harmonisation across partner institutes and with other ongoing EU initiatives.

Science to Policy Translation - Work Package 5

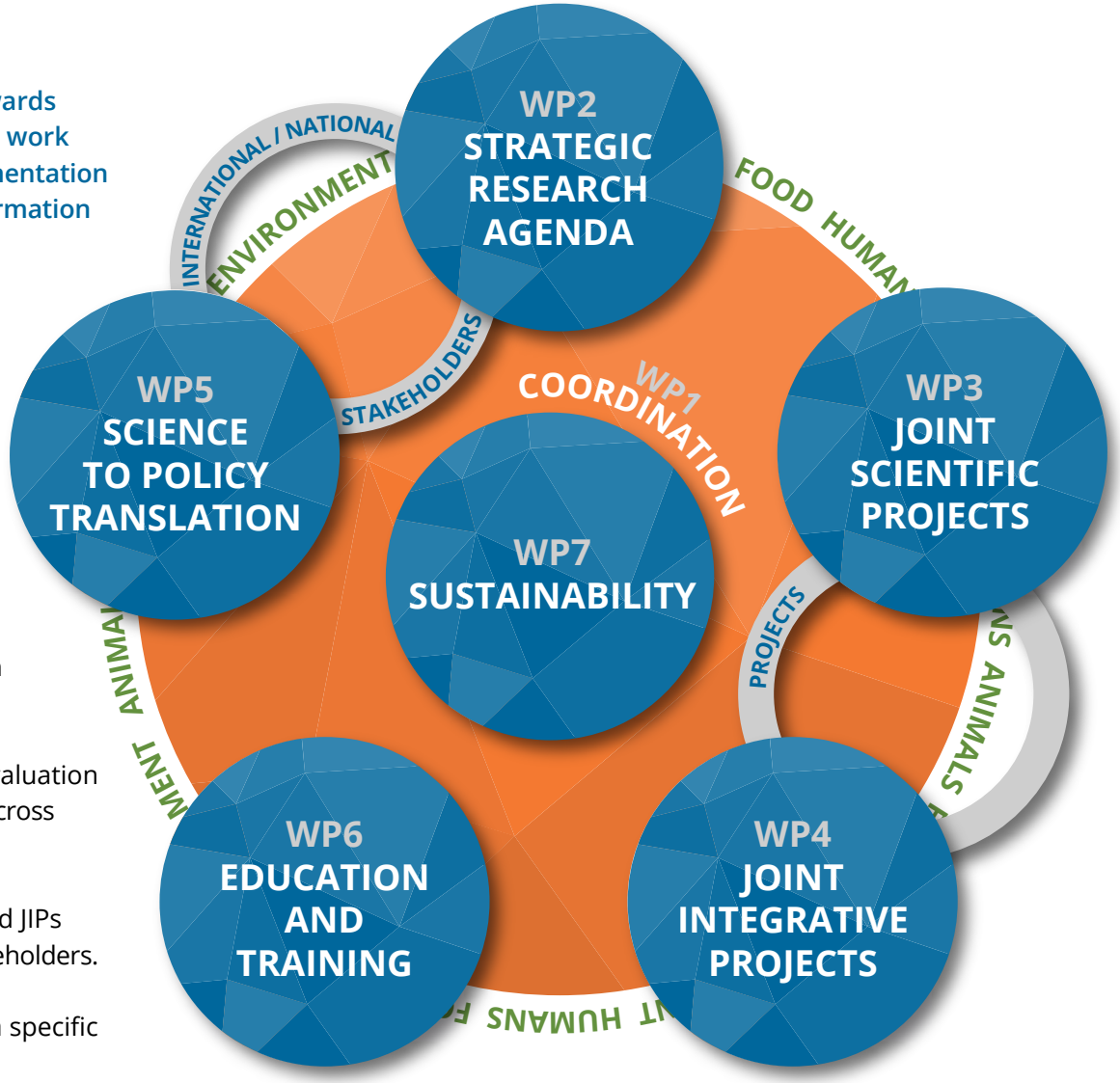
WP5 ensures best use of the scientific outcomes of the JRPs and JIPs through dissemination activities and networking with OHEJP stakeholders.

Education and Training- Work Package 6

WP6 develops and delivers innovative training platforms with a specific focus on One Health.

Sustainability- Work Package 7

WP7 explores operational means to sustain long-term research and innovation beyond the duration of the OHEJP.



What has the One Health EJP achieved in the second year?

IMAGE: PIXABAY

COORDINATION OF THE ONE HEALTH EJP

The coordination of the One Health EJP involves overseeing the organisation (WP1), coordinating the Joint Research and Joint Integrative Projects (WP3 and WP4 respectively) and coordinating the Education and Training activities (WP6), in addition to carrying out all central communication activities (WP1).

What were the key coordination activities in year two?

- Successful monitoring of the progress of the One Health EJP and reporting to the European Commission (EC). Additionally, communication with the Research Executive Agency (REA) on the One Health EJP Scientific Outcomes was essential.
- Successful co-ordination and management of the finalisation of 115 project deliverables and 26 overarching deliverables to the REA.
- The Coordinators have worked alongside the consortium governance bodies to establish strong working relationships, scientific collaborations and two-way communication.
- The Communications Team have enhanced communication throughout the consortium, stakeholders and external audiences. The One Health EJP website and social media platforms are informative for all audiences to share successes.
- A One Health EJP ethics report was prepared with the Ethics Advisors to ensure that all projects adhere to ethical principles.
- Ongoing support for the JRPs, JIPs, Education and Training activities and other One Health EJP events.
- The second round of Joint Research Projects (JRPs), Joint Integrative Projects (JIPs) and PhD projects were funded and supported.
- Guidelines for the Data Management Plan (DMP) were published and Zenodo, OpenAire were more extensively utilised to ensure that the One Health EJP data is open access.
- The calls to organise the 2020 One Health EJP activities: The Annual Scientific Meeting (ASM) and ASM Satellite Workshop, Summer School, CPD Module, Short Term Missions, Communication and Media Workshop were launched. These calls were internal to the consortium and will be hosted by one of the consortium member institutes.
- Contact was made with relevant Eastern European partner countries to facilitate their increased involvement in the One Health EJP activities.

IMAGE: PXHERE

TRANSLATION OF SCIENCE TO POLICY

A key aim of the One Health EJP is to identify Stakeholders' needs to update the Strategic Research Agenda (WP2), which ensures the scientific outcomes are useful, and supports the sustainability of the consortium (WP7). The impact of the One Health EJP's outcomes was maximised by targeted dissemination and communication to One Health EJP Stakeholders (WP5 and WP7).

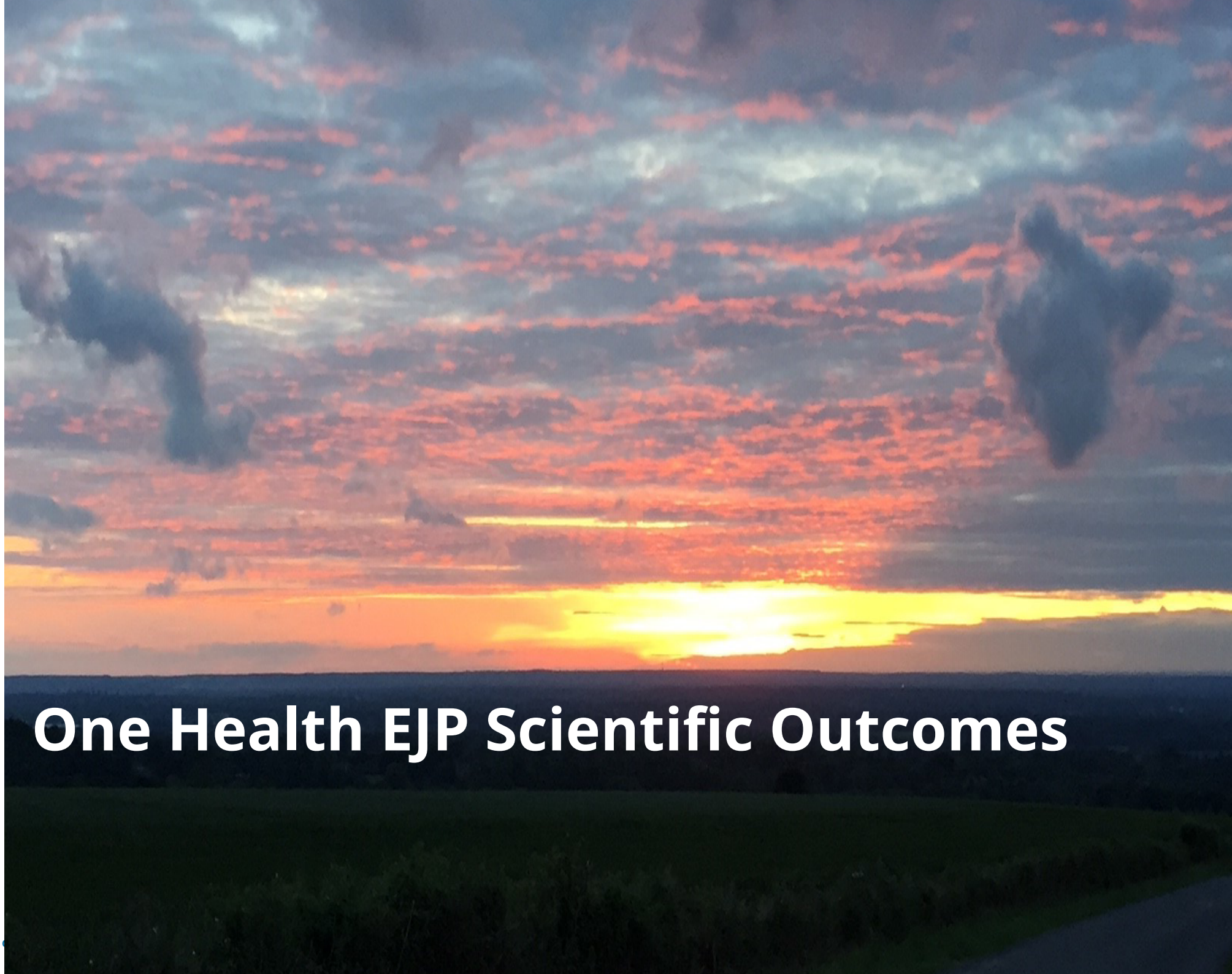
What were the key outcomes for year two?

- Year two focussed on the strengthening relationships and interactions with the One Health EJP stakeholders ECDC and EFSA. A key focus was working towards increasing collaborations with the JRPs and JIPs to ensure an open dialogue.
- The One Health EJP Annual Scientific Meeting proved to be an excellent platform for linking stakeholders with representatives from the One Health EJP JRPs and JIPs.
- The needs of the key EU stakeholders were integrated in the One Health EJP Strategic Research Agenda (SRA) and are continuously monitored to ensure that research is aligned to priorities at European level. Furthermore, interactions with other EU projects was established to create synergy and to avoid duplication.
- Contact was also being established with other international stakeholders: the Food and Agriculture Organisation (FAO), the World Organisation for Animal Health (OIE), the World Health Organisation (WHO), the European Environment Agency (EEA) and the European Medicines Agency (EMA).
- All One Health EJP scientific and integrative outcomes, as well as timely updates of the JIPs and JRPs were collected and documented in the "One Health EJP Outcome Inventory" which is currently in the process of being designed and implemented for a public audience.

Interactions with Stakeholders

- EU projects participated in the November Stakeholders Committee meeting, including the Joint Programming Initiative on AMR (JPIAMR) and the Joint Action of AMR and Healthcare Associated Infections (EU-JAMRAI), strengthening the relationships with other projects, facilitating knowledge sharing and avoiding duplication of work.
- A cogwheel workshop was set up with the EU projects IRIDA, INNUENDO and COMPARE to identify how the One Health EJP could build upon the outcomes of these projects.
- In many countries mirror groups have been initiated, where exchanges with national line Ministries were made possible or intensified.
- Discussions with DR-AGRI, DG-SANTE and DG-RTD have taken place during two REA Steering Group meetings this year.
- Contact with STAR-IDAZ and the Standing Committee of Agricultural Research Collaborative Working Group on Animal Health and Animal Welfare have been well maintained in 2019.
- ECDC and EFSA input was integrated into the topics of the 2nd call for JIPs and JRPs. The key EU stakeholders also provided feedback to the project proposals.
- Bilateral collaborations between JIPs, JRPs and stakeholders are ongoing on specific topics.

IMAGE: FAEK WIKI



One Health EJP Scientific Outcomes

ONE HEALTH EJP SCIENTIFIC OUTCOMES

To date, the One Health EJP has funded 24 Joint Research and 5 Joint Integrative Projects (WP3 and WP4) and a number of Education and Training activities (WP6) including a Doctoral Programme which has funded 16 PhD projects, 4 Short Term Missions, which are travel grants to facilitate travel to learn new skills, a number of workshops including 1 Satellite Workshop at the One Health EJP Annual Scientific Meeting, 1 Continuing Professional Development Module and 1 Summer School. To share the success of all of these scientific activities, the One Health EJP hosted its first Annual Scientific Meeting in Dublin, Ireland in May 2019.

What were the key scientific outcomes in the second year?

- An additional 13 Joint Research Projects were funded in the second call for projects to begin in January 2020.
- An additional 3 Joint Integrative Projects were funded in the second call for projects to begin in January 2020.
- The Kick-Off Meeting for these projects took place in Berlin, Germany in November 2019. This meeting welcomed all of the new OHEJP project leaders to the consortium.
- An additional 12 PhD projects were funded through WP6.
- One additional PhD student is working in the area of Social Sciences on the institutionalisation of One Health in a project called SUSTAIN, which is supported by the One Health EJP's sustainability Work Package, WP7.
- 4 Short Term Missions and 9 Short Term Integrative Missions were funded to facilitate the sharing of knowledge, information and to train researchers in new skills.
- 8 scientific publications were published.
- Additionally, tools and guidelines developed by the JIPs been published on publicly available websites (see COHESIVE and ORION updates).

IMPART

The IMPART project aims to develop and harmonise laboratory methods for the detection of antibiotic resistance. The optimisation and harmonisation of laboratory methods for detection of resistant bacteria is essential for antimicrobial resistance surveillance in animal pathogens and determining the risk of transmission of resistance from animals to humans via food.

Following the success of preliminary ring trials in the first year, the IMPART project used the second year to validate and harmonise laboratory protocols. The final design of the ring trials was confirmed and performed in the summer and autumn of 2019. Samples for the final trials were prepared at ANSES and sent to all partners in the project. These trials aimed to test different selective medias to detect bacteria resistant to carbapenems. The results from these trials will be available early in 2020.

Harmonisation of antibiotic resistance testing was also carried out on 17 different species of bacteria important in human, animal and environmental health. For most of these species, at least 5 project partners collected data from over 100 strains. Across partners, these data were shared and are currently being analysed. These data will be published on the EUCAST website which is the European database for antibiotic sensitivity testing, jointly organised by ESCMID, ECDC and European national breakpoint committees.

A draft protocol for disk diffusion tests was developed, optimised and standardised for *Clostridium difficile*. The ring trial for this will be completed when all partners have reviewed this protocol. Antimicrobial cut-off values for *C. difficile* will be determined early in 2020.

IMAGE: MICRORAO

ARDIG

The ARDIG project has made significant progress in the last year with important contributions from each of the ten partners, enhancing the collaborative efforts across Europe. Furthermore, a bioinformatics workshop was hosted at the lead institute, the APHA, which sought to train those within the project on whole genome sequencing methods used to characterise antimicrobial resistance (AMR). As a result of this workshop a priority list of AMR plasmids and *E. coli* sequence types were selected for characterisation within the project.

A key aim of the ARDIG project is to compare AMR and antibiotic sales and usage data from each of the partner national surveillance and research programs. These data have been collated for publication. Additionally, the collaboration between human and animal sectors has facilitated cross sector longitudinal studies on AMR, which were subsequently discussed on the bioinformatics workshop at the APHA. Consequently, partners will examine national collections of plasmids and *E. coli* isolates across countries and sectors. The project also aims to characterise AMR, plasmid transmission and fitness of multi-drug resistant isolates. Partners have been using a combination of molecular techniques, including whole genome sequencing. Partners will take approximately 500 *E. coli* isolates and compare five different AMR pipelines across institutes, so that a harmonised method can be used in the future.

One of the key goals of this project has been to consider the current approaches recommended by EU policy to tackle AMR, and to examine an array of surveillance and laboratory techniques in order to provide valuable information to support AMR policy in the EU.

IMAGE: FLICKR

RADAR

The RaDAR project aims to improve and harmonise modelling methods for improved understanding of risks, sources and disease burden by developing risk assessment models to quantify the on-farm development of antimicrobial resistance (AMR) and the subsequent spread to humans. In the last year, significant progress has been made using bioinformatic tools, risk assessment models and source attribution and disease burden models.

Public databases were used to collect AMR plasmid sequences and their metadata, these data were compiled into a comprehensive database which gave a global overview of plasmid diversity and classification. Additionally, this database has provided information on plasmid host range and transmission rates across human and animal health sectors. The project will continue to integrate new datasets into this database.

Modelling frameworks and datasets have been developed and completed to model the relationship between the use of antibiotics and the development of antimicrobial resistance, in addition to the on-farm transmission of resistance.

An inventory of risk assessment models to calculate risk of human infection by antibiotic resistant *E. coli* from food sources was developed in the first year and this year additional work to make this inventory functional and user friendly was undertaken.

Machine learning methods are important in this project to enable the quantification of risk and health effects of AMR bacteria in the food chain and the environment. Datasets for this aspect of the project were analysed with standard methods and have subsequently been published.

A mathematical model was designed to determine the extent at which infections with antibiotic resistant bacteria add to the burden of infection, in addition to analysing the number of antibiotic susceptible bacteria vs antibiotic resistant bacteria.

All of these models aim to improve the understanding of disease burden and AMR in the food chain and environment. Containment of AMR spread is important to address using a collaborative and integrative approach and the improvement of attribution and risk assessment activities have been encouraged by EFSA.

Publications:
Attributable sources of community-acquired carriage of Escherichia coli containing β-lactam antibiotic resistance genes: a population-based modelling study. 2019. Mughini-Gras L, Dorado-García A, van Duijkeren E, van den Bunt G, Dierikx CM, Bonten MJM, Bootsma MCJ, Schmitt H, Hald T, Evers EG, de Koeijer A, van Pelt W, Franz E, Mevius DJ, Heederik DJJ; ESBL Consortium. **Lancet Planetary Health**. 2019 Aug;3(8):e357-e369. doi: 10.1016/S2542-5196(19)30130-5.

IMAGE: PXFUEL

MAD-Vir

Metagenomics is the study of genetic material detected directly from humans, animals, food and the environment. The aim of the MAD-Vir project is to further develop and validate a metagenomic PanVirus microarray for the rapid detection of viral foodborne pathogens and emerging viral disease that cause illness in humans and animals. The developed PanVirus microarray provides a cheap, rapid, simultaneous and unbiassed detection of all known virus species and identification of novel viruses belonging to known virus families.

The developed microarray technology has been implemented, harmonised and tested in four EU reference laboratories. Other European reference laboratories have expressed interest in implementing this microarray and it is expected that at least five additional institutes will implement the technology in 2020. During the course of the project, 1,210 samples from human and animal origin were analysed with the microarray and showed success in detection from samples from many different sample types including but not limited to serum samples, respiratory samples, cell culture samples, skin swabs and water.

The microarray is also capable of detecting virus in unknow co-infections. Co-infections are predominantly identified in domestic farm animals and in gastrointestinal samples, with up to 10 different virus species.

This harmonised PanVirus microarray has clinical sensitivities comparable to that of qPCR in all samples except fish and whole blood. This tool is fast, easy and inexpensive, and could be used instead of whole genome sequencing. It may aid in early detection of both human and animal pathogens and will aid in sustained European preparedness and response to foodborne viruses. The results from this project have had significant interest within the human and animal health communities.

Publications:

Field samplings of *Ixodes ricinus* ticks from a tick-borne encephalitis virus micro-focus in Northern Zealand, Denmark. Petersen A, Rosenstierne MW, Rasmussen M, Fuursted K, Nielsen HV, O'Brien Andersen L, Bødker R, Fomsgaard A. Ticks Tick Borne Dis. 2019 Aug;10(5):1028-1032. doi: 10.1016/j.ttb-dis.2019.05.005. Epub 2019 May 19. sciencedirect.com

IMAGE: PEXELS

NOVA

The NOVA project strives to develop new surveillance tools and methods and to harmonise and optimise the use of existing surveillance data.

In the second year, work to align One Health terminology for the One Health Glossary in collaboration with the Joint Integrative Projects ORION and COHESIVE was ongoing. The common objective here is to create a cross sector glossary of One Health terminology that can facilitate collaboration.

The work to investigate surveillance opportunities and barriers across the food chain remains ongoing. During the summer of 2019 a qualitative study based on interviews was conducted with the aim of understanding the barriers and opportunities in foodborne disease surveillance from a One Health perspective. Furthermore, barriers of using consumer food purchase data or food data from healthcare systems have been explored through questionnaire studies. A network of European stakeholders who are interested in these data have been identified and a framework for using consumer food purchase data to map outbreaks has also been initiated. In addition, a review of outbreaks within health institutions has been conducted to review data that is now available.

Surveillance tools and algorithms have been explored for monitoring the incidence of *Salmonella* and *Campylobacter* from food and animal production to humans. High and low prevalence areas across Europe are also being investigated in order to understand the spatial aspects of disease surveillance. These studies are also studying the role of the environment in spread of disease, therefore using a truly One Health approach. Other tools are being utilised to investigate the effect of surveillance in animal production on consumer exposure to foodborne pathogens. Data are being collected to assess the efficacy of metagenomic surveillance in different parts of animal production in different countries across Europe. Analysis of these data will continue in the third year of the project.

The NOVA project has developed new methods and more effective use of existing data and methods. These will aim to bridge the gap between human and animal foodborne pathogen surveillance and aligns with ECDC's long-term surveillance strategy and EFSA's research requirements.

Publications:
Marta Martínez-Avilés, Macarena Garrido-Estepa, Julio Álvarez, Ana de la Torre. *Salmonella* Surveillance Systems in Swine and Humans in Spain: A Review. Vet. Sci. 2019, 6, 20; doi:10.3390/vetsci6010020 www.mdpi.com/journal/vetsci.
mdpi.com

IMAGE: PXFUEL

TOX-detect

The TOX-detect project focuses on three foodborne bacteria: *Staphylococcus, Bacillus* and *Clostridium*. These bacteria are responsible for a number of food poisoning outbreaks across Europe, as a result of the toxins produced by these bacteria. The goal of this project is to fill in the gaps in the methods used to detect these toxins and the bacteria that produce them.

The strains selected in the first year have been characterised, including the characterisation of the toxins and virulence factors that they produce. Characterisation of toxins and virulence factors was completed using mass spectrometry techniques. This is the first time that a spectra library and reference collection of strains have been developed and characterised across the EU. These relevant tools will enable partners to develop methods to improve food outbreak characterisation due to toxins produced by bacteria.

According to EFSA annual zoonoses reports, bacteria toxin outbreaks remain poorly characterised, therefore it is important that tools are developed to monitor these outbreaks, this is the main focus of the TOX-detect project.

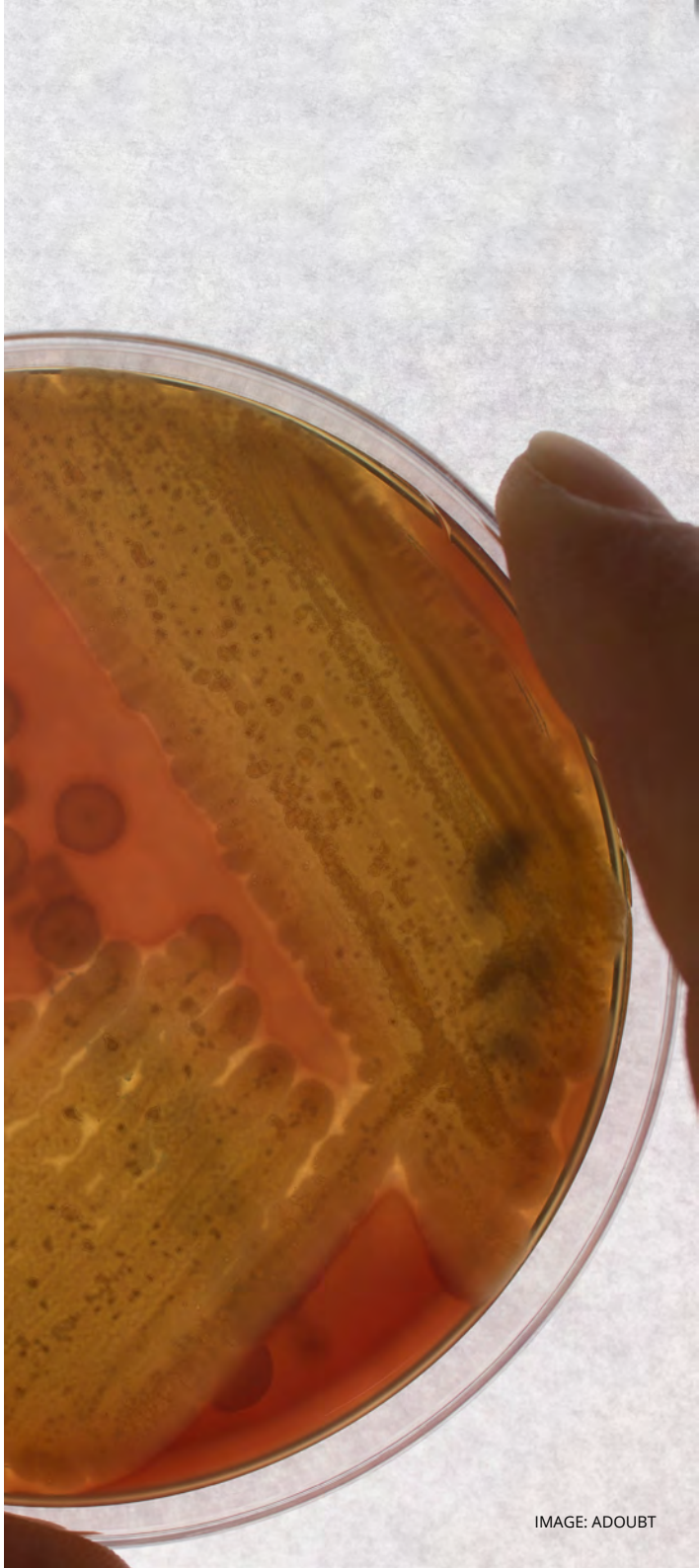


IMAGE: ADOUBT

LISTADAPT

A collection of 1738 characterised strains of *Listeria monocytogenes* were collected by different partners within the LISTADAPT project. The collection is the first of its kind in Europe and consists of strains collected from the environment (soil, river, farm environment), wild and farm animals (both healthy and with clinical symptoms of disease), ready to eat food and human infection. To collect such a comprehensive strain collection, collaboration between partners was essential and required several sampling campaigns.

Each of these strains was genome sequenced and characterised in the laboratory. Laboratory characterisation included assessing the susceptibly of the strains to 14 antibiotics and 8 biocides, in addition to observing strain survival in soil, in food and in the gastrointestinal environment. The genomic and laboratory data were analysed to further understand the *L. monocytogenes* strains and their resistance to antibiotics and other antibacterial substances such as biocides. Determining how resistance is conferred (plasmids, mobile genetic elements, transposons etc) is an important aim of this work.

The research conducted during this project facilitated the use of whole genome sequencing as a method of *L. monocytogenes* surveillance in Europe. This approach has been previously recommended by both ECDC and EFSA. Furthermore, these genomic approaches could provide useful information for the development of new diagnostic tests to screen food, environments and animals for *L. monocytogenes*, these tests would improve surveillance and policy for food processing and food safety.

IMAGE: KADENA

METASTAVA

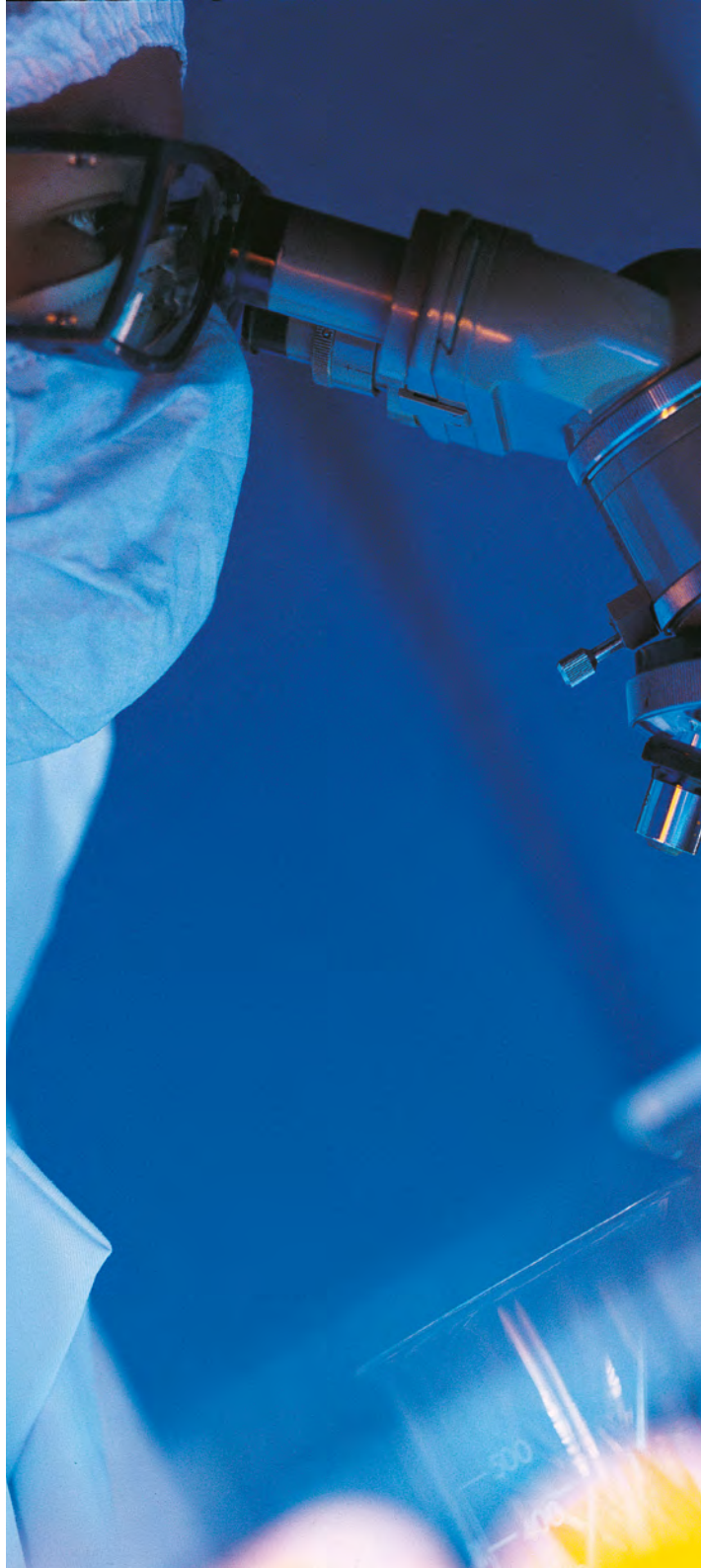
The main aim of the METASTAVA project is to evaluate the potential use of metagenomic data analysis, using targeted collection of reference data from public health reference laboratories. Metagenomics is the study of genetic material recovered directly from environmental samples and it is being increasingly used to identify possible causes of unexplained disease outbreaks.

A key task in the second year of the project was to standardise workflows for the generation and analysis of metagenomic data, in order to achieve this, a schematic was created providing guidelines for sample preparation, critical parameters for analysis, appropriate interpretation criteria and potential follow up strategies.

The project addresses gaps in knowledge for hepatitis E virus, norovirus, zoonotic pox viruses, antibiotic resistant bacteria and Shigatoxigenic *E. coli* (STEC) and subsequently these pathogens have been used to develop methods and reference datasets. Collaboration between all partner has been essential to evaluating methods, interpreting data and also evaluating quality control methods on parallel datasets.

Partners of the METASTAVA project participated in the COMPARE 2018 food metagenomics proficiency test, and later in the year carried out a METASTAVA proficiency test using samples from one of the project partners. The data collection is being finalised and the analysis is planned for the third year of the project.

The work to standardise and validate metagenomics methods in both human and animal reference laboratories will allow improved understanding of the One Health approach, in addition to increasing preparedness for emerging threats. METASTAVA also provides a platform for diagnostic laboratories from both human and animal health sector to jointly discuss parameters when implementing metagenomics methods for diagnostic purposes, thus promoting a One Health approach.



MoMIR

The MoMIR project aims to develop new approaches to predict, identify and prevent the appearance of animal and human 'super-shedders' based on immune response and composition of the gut bacteria. 'Super-shedders' are those that spread high numbers of bacteria in their faeces and often have a high level of the bacteria in their gut; the focus of the MoMIR project is *Salmonella*. The project also aims to develop a mathematical model to investigate *Salmonella* transmission between animals, in addition to exploring control measures such as pre- and probiotics.

By the end of the second year, the project identified predictive biomarkers associated with animal super-shedder status, in addition to identifying key differences in the composition of gut bacteria between high and low *Salmonella* shedders.

The suitability of pre- and probiotics as preventative measures for *Salmonella* super-shedders was also investigated concurrently with a mathematical model to investigate the dynamic interplay between gut bacteria, the pathogen and the host's immune response. The mathematical model is now be validated and refined as necessary to create a useful tool for future studies. Finally, a draft inventory of relevant intervention measure against *Salmonella* in layer hen production was developed, with the cost effectiveness of probiotic intervention strategies to reduce *Campylobacter* prevalence in boiler hens also being calculated. This model has been refined for use in several countries across Europe.

The research conducted within the MoMIR project is working towards the EFSA recommendations, which are to control *Salmonella* with the use of preventative measures throughout the whole food production chain.

Publications:

Rebollada-Merino A., Bárcena C., Ugarte-Ruiz M., Porras-González N., Mayoral-Alegre F., Tome-Sánchez I., Domínguez L. and Rodríguez-Bertos A. Effects on Intestinal Mucosal Morphology, Productive Parameters and Microbiota Composition after Supplementation with Fermented Defatted Alperujo (FDA) in Laying Hens. Antibiotics. 8:215. 2019. (A). ISSN: 2079-6382. DOI: 10.3390/antibiotics8040215

IMAGE: PIKIST

MedVetKlebs

The main objective of the MedVetKlebs project is to develop and disseminate novel methods to detect *Klebsiella pneumoniae* in complex environments, such as food and soil. This will help to define strategies to control the spread of *K. pneumoniae* which is a significant threat to public health when associated with multi-drug resistance.

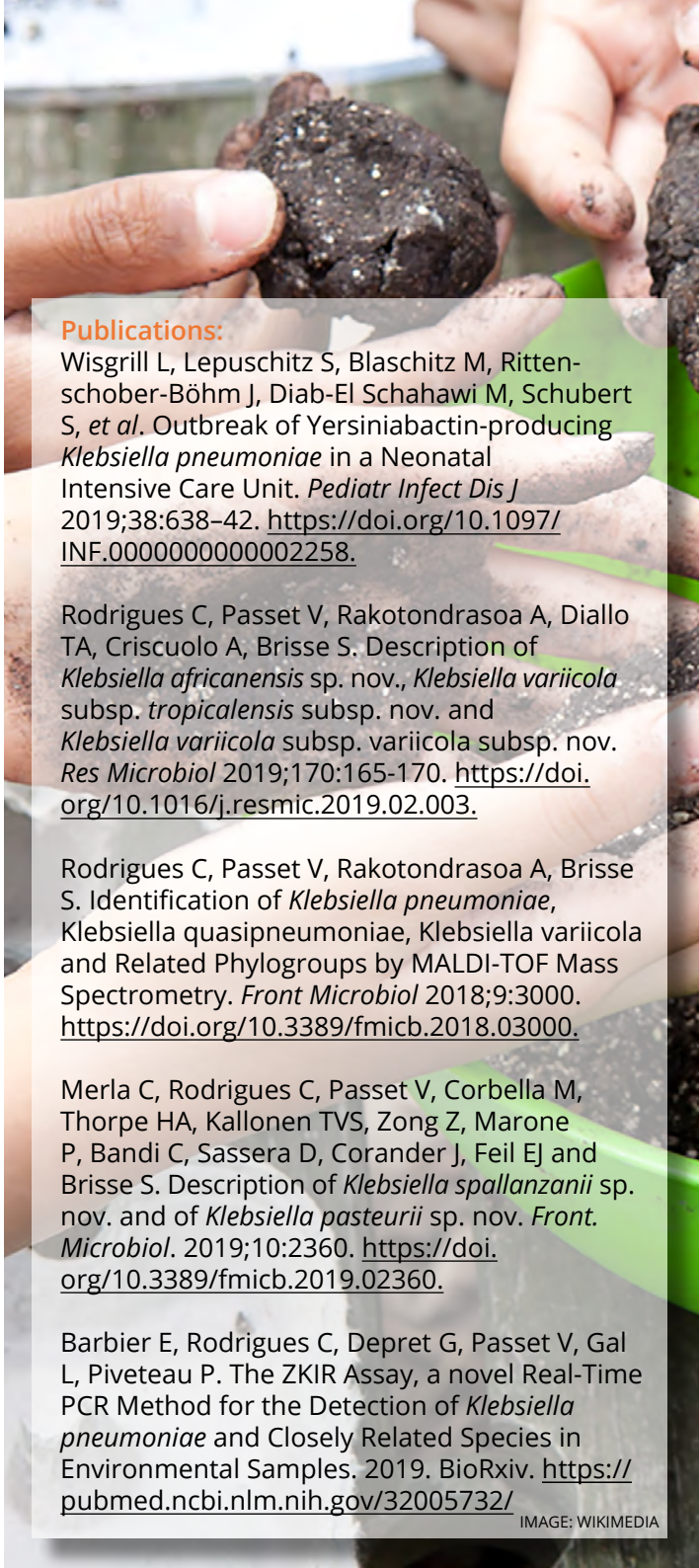
The isolation and detection *K. pneumoniae* required harmonisation, and within this project Simmons Citrate with Inositol agar (SCAI) was determined as the most suitable growth media. This agar also allows selective growth across a wide range of *K. pneumoniae* strains. To ensure these culture methods were suitable to culture these bacteria from food, *K. pneumoniae* isolation protocols were optimised and are readily available here.

In addition to laboratory culture methods, molecular methods were developed using real-time PCR for the detection of *K. pneumoniae*, the protocol is also readily available and can be found here.

These methods have enhanced the capacity for *K. pneumoniae* surveillance in food, veterinary and environmental microbiology. This subsequently improves the One Health knowledge of this organism.

Broad sampling from 3,781 different samples was conducted, these samples were primarily from food and environmental samples. Of these samples, chicken meat and ready-to-eat salads were selected for further analysis. The aim of this research was to compare molecular and culture methods to detect *K. pneumoniae* from different environments.

The work within the MedVetKlebs project has also led to updates of the *Klebsiella* taxonomy which have subsequently been published.



Publications:

Wisgrill L, Lepuschitz S, Blaschitz M, Ritten-schober-Böhm J, Diab-El Schahawi M, Schubert S, *et al*. Outbreak of Yersiniabactin-producing *Klebsiella pneumoniae* in a Neonatal Intensive Care Unit. *Pediatr Infect Dis J* 2019;38:638–42. https://doi.org/10.1097/INF.0000000000002258.

Rodrigues C, Passet V, Rakotondrasoa A, Diallo TA, Criscuolo A, Brisse S. Description of *Klebsiella africanensis* sp. nov., *Klebsiella variicola* subsp. *tropicalensis* subsp. nov. and *Klebsiella variicola* subsp. variicola subsp. nov. *Res Microbiol* 2019;170:165-170. https://doi.org/10.1016/j.resmic.2019.02.003.

Rodrigues C, Passet V, Rakotondrasoa A, Brisse S. Identification of *Klebsiella pneumoniae*, Klebsiella quasipneumoniae, Klebsiella variicola and Related Phylogroups by MALDI-TOF Mass Spectrometry. *Front Microbiol* 2018;9:3000. https://doi.org/10.3389/fmicb.2018.03000.

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IMAGE: WIKIMEDIA

AIR SAMPLE

The AIR SAMPLE project aims to develop and validate air sampling as a low-cost method to detect *Campylobacter* in broiler production, replacing analysis of faecal droppings and boot swabbing. The research in this project aims to move through four phases:

Harmonisation -> Implementation -> **Evaluation** -> Validation

In the second year, the project successfully moved to the evaluation stage. All method harmonisation and implementation was completed across the project partners. The methods developed use an air sampling device, which is type of mini vacuum cleaner which is fitted with a special filter to collect bacteria from the chicken house environment. To detect *Campylobacter*, a combination of culture and PCR testing is used. These methods can produce results in two hours, compared to four days for traditional methods.

Field studies have tested 44 flocks from four EU member states (Italy, Czech Republic, Denmark and Poland), in addition to using Norwegian flocks as a negative control as Norwegian chicken flocks are generally *Campylobacter* free. The data from these studies have shown that the air sampling methods quadruples the likelihood of detecting *Campylobacter* in the environment.

To understand more about this method, the AIR SAMPLE group have created a video to demonstrate the protocol.

These methods have the potential to become part of future surveillance of *Campylobacter* in the poultry industry across the world due as they use low-cost, commercially available instruments. Furthermore, they have the potential to have a positive impact on contamination control in poultry production across Europe.

Publications:

Gro S. Johannessen[1a], Giuliano Garofolo[2a], Gabriella Di Serafino[2], Ivana Koláčková[3], Renáta Karpíšková[3], Kinga Wieczorek[4], Jacek Osek[4], Julia Christensen[5], Mona Torp[1] and Jeffrey Hoorfar: *Campylobacter* in chicken – critical parameters for international, multicentre evaluation of air sampling and detection methods. Food Microbiology.

IMAGE: WIKIMEDIA

ORION

The primary aim of the ORION project is to establish and strengthen collaboration and cross-disciplinary knowledge transfer to promote One Health disease surveillance. This project consists of 13 partners from veterinary and public health institutes from seven different European countries. Each of these institutes is committed to adopting best practice One Heath surveillance solutions.

In the second year, the project progressed from the "inventories and requirements analysis" phase in to the "improvements and new resources" phase. This phase includes One Health pilots in different countries, in addition to the development of new resources which were identified in the first year.

In 2019, the design of the ORION "One Health Surveillance Codex" was completed. This codex complies with and extends the Tripartite Guide to Addressing Zoonotic Diseases in Countries as it evolved in to a guidance document that provides practical recommendations, solutions and resources for the ORION research. Additionally, the "One Health EJP Glossary" was further developed to provide a glossary of One Health terminology which is designed to support animal health, public health and food safety sectors.

Another aim of the ORION project was to create a "One Health Surveillance Knowledge Hub", which was drafted in the second year. This knowledge hub is a cross disciplinary inventory of the data sources, methods and tools currently available that support One Health surveillance.

The project has designed a number of country specific pilots which aim to illustrate and validate the usefulness and added value of the ORION research and concepts developed throughout the project thus far.

The overall integrative activities of the ORION project increasingly create impact as the project aims to harmonise surveillance tools using a One Health approach and cross sector collaboration. Furthermore, the project has strong relationships with the OHEJP stakeholders ECDC and EFSA, this will ultimately aid in facilitating the translation of science to policy.

Publications:

S. Stelzer, W. Basso, J. Benavides Silván, L.M. Ortega-Mora, P. Maksimov, J. Gethmann, F.J. Conraths, G. Schares, *Toxoplasma gondii* infection and toxoplasmosis in farm animals: Risk factors and economic impact, Food and Waterborne Parasitology, Volume 15, 2019, e00037, ISSN 2405-6766.

IMAGE: PEXELS

COHESIVE

The COHESIVE project aims to strengthen the human-veterinary-food collaboration, with the ultimate goal of improving risk assessment, communication and exchange of information and data. The project has worked closely with the Tripartite Guide to Addressing Zoonotic Diseases in Countries to determine the national One Health approaches that could be established and/or strengthened in European countries. To promote these collaborations, the COHESIVE project has begun to draft a simplified European guidelines regarding the implementation of the Tripartite Guide. Barriers to the implementation of these guidelines have also been identified and discussions are ongoing.

Another key aim of this project is to develop a tool to decide which tools and models are best for risk assessment in different situations. An early prototype of this tool has been developed in the second year and a webinar was held to inform all COHESIVE members of the prototype and welcome feedback to further improve and refine the tool.

Workshops were held to discuss how information on disease events and outbreaks is shared across Europe. It was decided that it would be useful to identify the different factors that contribute to successful ways to share information and to explore why signal sharing works well in context. Interview guidelines were developed, and interviews were held in the second year. These data will be analysed in the third year. Further questionnaires were disseminated to investigate horizon scanning tools; horizon scanning is a technique for detecting developments through examination of potential threats. Drivers for change for One Health issues and future challenges have also been discussed.

A list of available tracing tools were compiled, evaluated and published so that they are widely available to interested parties. It can be found here. In addition, a physical tracing web portal was set up and several prototype modules for data collection, data cleaning, data visualisation and reporting were implemented. Data formats to collect sample and case data were developed. Their visualisation was tested in case studies and in a current outbreak.

COHESIVE aims to bridge the gaps in risk-analysis in the public health, food safety and veterinary health sectors, by enhancing collaboration on all zoonotic threats. COHESIVE works closely with key stakeholders such as ECDC, EFSA, the European Commission and national policy makers to ensure the research is beneficial, non-duplicative and uses a One Health approach.

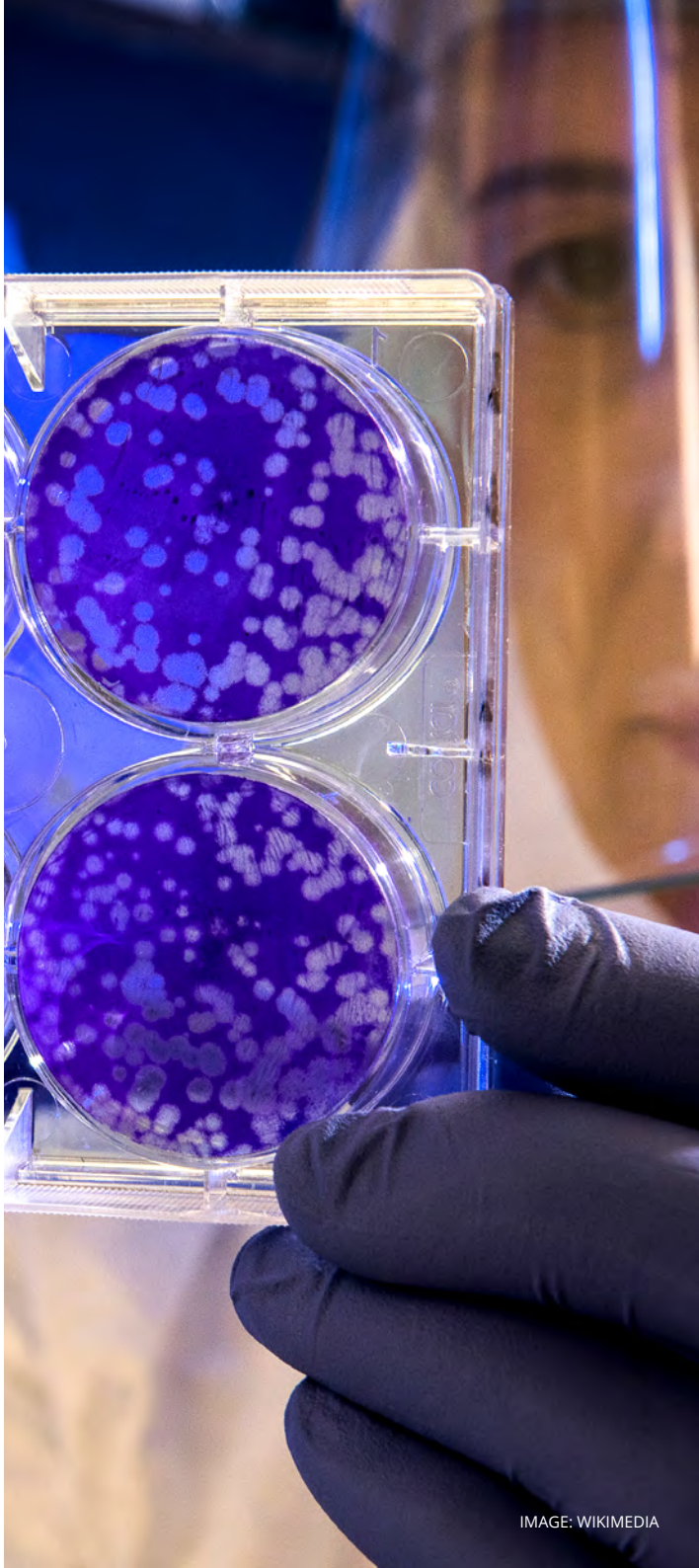


IMAGE: WIKIMEDIA

One Health EJP PhD Programme Progress

The One Health EJP Doctoral Programme is an Education and Training activity (WP6) and provides an interdisciplinary training environment for the next generation of One Health researchers in Europe. The Education and Training activities contribute to the transdisciplinary cooperation, integration of activities and the sustainability of the One Health approach. The Programme offers flexibility in the PhD projects ensuring innovative hypothesis driven research, and provides opportunities to explore and share skills, expertise and knowledge from the OHEJP consortium, therefore accelerating both the rate and quality of research. In total, WP6 has co-funded 16 PhD projects. Of these, two projects (LIN-RES and ECO-HEN) began at the start of 2019; six PhD projects started at the end of 2019, and eight PhD projects will start in 2020.

LIN-RES

The LIN-RES project aims to investigate the origin, transferability and risk factors associated with Linezolid resistance in Gram- positive bacteria from both human and animal origin. Linezolid is an antibiotic used as one of the last resort drugs to fight human infections by multi-drug resistant Gram- positive bacteria such as *Streptococcus, Staphylococcus* and *Enterococcus*.

In 2019, 1,049 faecal samples from cattle, pigs and poultry and 131 nasal swabs from pigs were collected in Belgium and investigated for Linezolid resistance. Of the 1,180 samples, 87 Linezolid resistant strains were isolated. From human samples (urine, blood or skin lesion), 3 Linezolid resistant strains were isolated. Full genome sequencing has been completed on 13 of these strains and 3 key resistance genes were detected: *cfr, optrA* and *poxtA.* Additionally, mutations that confer resistance were identified in the 23S rRNA gene. More strains are currently being sequenced and Linezolid resistance determinants are being identified.

ECO-HEN

The main aim of the ECO-HEN project is to fill in the knowledge gaps regarding the transmission of antibiotic resistant *E. coli* from the commercial laying hen industry and to determine to what extent this animal production poses a public health risk via food and/or environment contamination.

A collection of *E. coli* whole genome sequences from strains collected from a laying hen farm over a four year period were analysed using bioinformatic tools. The aim of this was to investigate antimicrobial resistance genes (using ResFinder) and antimicrobial resistance plasmids (using PlasmidFinder), in addition to using phylogenetic analysis to visualise the relationships between the strains collected (using SNP analysis). The investigation of antimicrobial resistance genes found that some resistance genes are found on plasmids in some *E. coli* strains and in the chromosome of other strains that share similar environments. Work to investigate the horizontal transfer of antimicrobial resistance genes has started and is ongoing.

IMAGE: RAWPIXEL

One Health EJP Dissemination Activities

IMAGE: PIQSELS

ONE HEALTH EJP DISSEMINATION ACTIVITIES

The OHEJP is committed to sharing the results and knowledge from all its activities.

All of the OHEJP consortium members play a key role in this. There are several ways in which we do this:

- The OHEJP has developed a Communication Strategy to ensure that its activities are well publicised to maximise the impact of the scientific research and collaborative activities. This strategy is comprehensive and defines key audiences, channels for internal and external communications (including a digital strategy), communication tools and OHEJP branding. It is important that the OHEJP targets not only scientists, but also policy makers, our stakeholders, public health government departments and the general public.
- A Data Management Plan has been developed to ensure that the OHEJP is transparent and our data is FAIR: findable, accessible, interoperable and reusable.
- The OHEJP has developed a Dissemination Procedure and a Publication Policy to maximise the efficiency of dissemination of scientific results to the target audiences using the appropriate communication channels.
- The OHEJP website and social media platforms serve as central platforms to publish all events, research activities, news and key information to a wide audience.
- The OHEJP issues regular newsletters which contain highlights and links to the OHEJP's scientific and collaborative activities, these newsletters are an important tool to disseminate news on a regular basis.
- Press releases are released for OHEJP events or OHEJP related news of public interest. Each OHEJP ASM has a press release following each event in the local hosting country.
- Every year the OHEJP organises an Annual Scientific Meeting. This is a key OHEJP event to communicate and disseminate the scientific outcomes of the Joint Research and Joint Integrative Activities, in addition to the OHEJP PhD projects. This event will also facilitate collaboration with One Health experts both internal and external to our consortium.

IMAGE: PXFUEL

- The website has an internal events survey for consortium members to complete to document dissemination activities such as conferences, meetings and workshops.
- The OHEJP Project Management Team (consisting of all Work Package Leaders and Deputy Leaders) communicate on a weekly basis to discuss their progress, exchange information with each other and update on Stakeholder needs.
- Establishing excellent relationships with key Stakeholders, including ECDC and EFSA facilitate our aim to translate science to policy, in addition to ensuring there is no duplication of research between major European organisations.
- The OHEJP also disseminates important scientific results on a regular basis to our funders and the Research Executive Agency (REA), ensuring exchange of information and knowledge and maximising impact.
- Close relationships have been established with other EU projects such as EU- JAMRAI, JPIAMR, EFFORT and COMPARE with the aim of exchanging scientific and technical expertise in the scientific community.
- Collaborative relationships have also been established with the One Health Platform, a One Health scientific reference centre and network of One Health stakeholders; and with the One Health Commission, a globally focused organisation dedicated to implementing One Health actions around the world. The Communications Team have worked very closely with the Communications Teams of these two organisations to promote OHEJP's open events such as the ASM.
- Organising Education and Training activities to aid in training the next generation of One Health researchers.
- Scientific and integrative outcomes, as well as timely updates of JIPs and JRPs, have been collected and documented in the 'One Health EJP Outcome Inventory' which was prepared to be launched for the use of wider audience.

IMAGE: PXHERE

The First One Health EJP Annual Scientific Meeting

The very first One Health EJP Annual Scientific Meeting was held on the 22nd-24th May 2019 in Dublin, Ireland.

The event was a huge success and bought together almost 300 delegates from across Europe, showcasing a wide variety of One Health research with over 80 posters and over 60 oral presentations. The quality of the One Health research presented was exceptional from all researchers and PhD students. This event facilitated collaboration across the EU and the creation of a One Health Community. It also provided a platform for the One Health EJP JIPs, JRPs and PhDs to present their work to the wider One Health community, meet one another and to meet key stakeholders.

The event was jointly organised by TEAGASC and NUI Galway, our Irish partner institutes. This conference offered an ideal platform for presenting research and initiating collaborations between partner institutes. It also provided the Communications Team the opportunity to meet with consortium members for the first time, share One Health EJP merchandise and offer communication and website support.

In addition to an exceptional scientific programme, the social events provided the perfect platform to catch up with colleagues, friends and collaborators, all while taking in Dublin's Trinity College and all of its history, eating great food at the Teagasc BBQ and learning to dance at the Round Room at the Mansion House at the Gala Dinner.

Our Keynote speakers provided captivating and inspiring talks and in particular we would like to extend our sincere gratitude to Lord Jim O'Neill, Stef Bronzwaer from EFSA, Dr. Karin Johansson from ECDC, Professor Martin Cormican from NUIG and Dr. Arie Havelaar from the University of Florida for contributing to the Annual Scientific Meeting.

Educating the next generation of One Health researchers

EDUCATION AND TRAINING

WP6 develops and delivers innovative training platforms and materials with a specific focus on One Health. The activities are targeted towards early career researchers, professional researchers and students at different stages of their education.

ONE HEALTH EJP SUMMER SCHOOL 2019

One of the main objectives of WP6 is to develop and deliver innovative training platforms and materials with a specific focus on One Health. The activities are targeted towards early career researchers, professional researchers and students at different stages of education.

Our annual summer schools are an important component of the One Health EJP, as they provide One Health training opportunities for the next generation of One Health scientists from across Europe and worldwide.

Organising institutes: University of Surrey, UK in collaboration with Public Health England, UK and Wageningen Bioveterinary Research, the Netherlands.
Location: University of Surrey, Guildford, UK and Chatham House, London, UK
Dates: 19th-30th August 2019

Collaborative interactions: The summer school programme provided opportunities to have collaborative discussions, for knowledge and experiences to be shared and for collaborative engagements and future relationships to be formed amongst speakers and 20 delegates from across the globe including Italy, Spain, France, Kenya, USA, Thailand, Russia, India, Poland, Hungary, Switzerland, the Netherlands and the UK.

Delegates also had opportunities to network and socialise with each other and with speakers at the organised social events.

Since the summer school, some delegates have applied to attend the OHEJP's other training and educational events, and so this workshop directly contributes to building a future consortium to support the sustainability of the OHEJP (WP7), and to extend the OHEJP outside the EU in alignment with the "Go Global" approach.

Delegates: Delegates belonged to a range of education levels and interdisciplinary backgrounds which brought a diverse pool of experience and knowledge in One Health to provide this opportunity of these unique multi-disciplinary and collaborative interactions. The delegates' profiles included veterinary surgeons, Doctor of Medicine, Epidemiologists, Early Career Researchers, post-doctoral researchers, institute researchers, MSc students, and finally PhD students in public health, animal health, environmental health, antimicrobial resistance, biological sciences, veterinary medicine, nutrition, health economics, global one health, and wildlife ecology.

Programme: The theme of the two-week OHEJP Summer School 2019 was 'One Health Operationalisation', which focused on the challenges involved in identification of concrete actions to implement the One Health concept across the three domains- human health, animal health and environmental health. One Health actions must contribute more value than the traditional domain-specific approaches. The necessary steps to support a value-driven and efficient One Health operationalisation were at the centre of this summer school. The programme delivered an introduction to One Health basics, prediction approaches, analyses of integrated disease surveillance, outcomes research, risk management, and decision quality.

For further information about the programme, to view delegate testimonials, click here.

ONE HEALTH EJP ASM SATELLITE WORKSHOP 2019

One of the main objectives of WP6 is to develop and deliver innovative training platforms and materials with a specific focus on One Health. The activities are targeted towards early career researchers, professional researchers and students at different stages of education.

Our annual satellite workshops run alongside our Annual Scientific Meeting, and each workshop focuses on one of the priority areas of the One Health EJP.

Organising institutes: National Veterinary Institute (SVA), Sweden in collaboration with University of Surrey, UK and Sciensano, Belgium.
Location: Teagasc Conference Centre, Dublin, Ireland
Date: 21st May 2019

Collaborative interactions: The workshops provide opportunities for collaboration and knowledge and skills exchange between OHEJP partners. These scientific and social interactions are an important goal and aspect of integration of the workshop. This workshop also contributes to building a future consortium to support the sustainability of the OHEJP (WP7).

Delegates: The workshop hosted 44 delegates belonging to the OHEJP Consortium. The three health domains that constitute the One Health concept were represented at this workshop, demonstrating a truly One Health Approach. Furthermore, the three key OHEJP research domains (foodborne zoonoses, antimicrobial resistance and emerging threats) were also well represented at this workshop. Attendees to this workshop included researchers, research group leaders and PhD students at academic institutes within the OHEJP consortium. It was exciting to see the interest from PhD students as encouraging the use of data management plans early on in their scientific career is of increasing importance in research.

Programme: The workshop theme was 'Digital Innovation and Data Management', which aimed to provide a platform to discuss digital innovation in the research domains of foodborne zoonoses, antimicrobial resistance and emerging threats. The workshop also aimed to develop an understanding and interest in data management plans. This proved to be an excellent opportunity to understand how data management plans can be applied to one's research.

The programme consisted of an introductory lecture by OpenAire, who presented the initiative, and explained how it links to EOSC, the European Open Science Cloud and how these new resources could be of benefit to the OHEJP partners. The lecture was followed by a practical workshop on how to plan your data management. The second part of the satellite workshop was dedicated to digital innovation lectures, focusing on the use of Artificial Intelligence (AI) within the scope of the OHEJP for tackling foodborne zoonoses, antimicrobial resistance and emerging threats.

For further information about the programme, click here.

SHORT TERM MISSIONS

Short Term Missions (STMs) are small travel grants with the aim of:

- Sharing scientific expertise, methodologies, equipment and facilities to harmonise the existing approaches and methodologies within the large OHEJP European network.
- Driving the research forward in a collaborative and non-duplicative fashion to strengthen both the scientific capacity within the OHEJP.
- Contributing to future prevention, preparedness, detection and response of the EU to foodborne and other emerging threats across human-animal-environmental sectors.

THE ONE HEALTH EJP FUNDED 4 SHORT TERM MISSIONS IN 2019

STM 1: Training on the application of source attribution models

Home Institute: IZLER, Italy
Mission Hosting Institute: RIVM, the Netherlands
Duration of mission: 1 week

Aim of mission: The aim of this mission was to enhance source attribution skills through an *ad hoc* structured and supervised training, which included exercises with real data and validation of learnt competences.

The need for this mission fell within the context of an ongoing process of updating the current routine surveillance of foodborne pathogens with sequence based techniques at IZSLER. IZSLER carries out surveillance plans for the most populous region of Italy, Lombardy, producing large amounts of data. Therefore, the integration of surveillance data with source attribution analyses, could be of great usefulness to improve the positive outcomes on the regional territory.

For further details and complete testimonials, view the STM case study.

"...I am thoroughly grateful to the OHEJP for having granted such a stimulating and professionalizing experience, and I am confident that the newly learnt competence will advance the positive impact of our ongoing surveillance activities."

Virginia Filipello, IZLER

STM 2: Application of advanced epidemiological analytical methods for antimicrobial resistance data of Salmonella in pigs

Home Institute: VISAVET-UCM, Spain
Mission Hosting Institute: Centre for Statistics, Hasselt University
Duration of mission: 7 weeks

Aim of mission: The aim of this mission was to develop skills in analysing data on phenotypic antimicrobial resistance (AMR) to identify patterns among the occurrences of resistance of different antimicrobials to better understand the interactions and dynamics in *Salmonella* in pigs.

During this STM, analysis of AMR data for *Salmonella* isolates collected between 2001-2013 through the Spanish Veterinary Antimicrobial Resistance Surveillance Network programme was performed. The antimicrobials included Cefotaxime, Chloramphenicol, Ciprofloxacin, Florfenicol, Gentamicin, Nalidixic acid and Tetracycline.

Multiple techniques, including principal component analysis, multiple correspondence analysis, hierarchical clustering, and latent class analysis, were performed to detect potential patterns and clusters among the AMR data. Generalised estimating equations were conducted to examine the evolution of the proportion of the resistant strains of each of the seven antimicrobials. Additionally, the structures of relationships among the antimicrobials were examined by Bayesian network analysis. Efforts to develop new approaches to Bayesian network analysis in Stan also took place.

The work performed during this STM demonstrated useful analytical techniques to explore the interactions among AMR and associations between AMR and *Salmonella* serotypes. On the base of this action, development to explore AMR phenotypes continues to be carried on.

For further details and complete testimonials, view the STM case study.

"...This short-term mission allowed us to extend connection to institutes external to OHEJP and to form new collaboration. Besides the benefits at the project and institute level, I as a researcher also benefited greatly... Thanks to OHJEP for giving me this opportunity!"

Kendy Tzu-Yun Teng, VISAVET-UCM

STM 3: Training in bioinformatics to study the dynamics of E. coli in laying hens: Training on the application of source attribution models

Home Institute: VISAVET-UCM, Spain
Mission Hosting Institute: DTU, Denmark
Duration of mission: 4 weeks

Aim of mission: The aim of this mission was to improve the participants' existing bioinformatics knowledge. The National Food Institute of DTU is part of the Centre of Genomic Epidemiology which has several web services for the analysis of whole genome sequences.

During this month, the participant learned to perform phylogenetic analysis using the complete DNA sequence and worked in the construction of phylogenetic trees with both programs of the Centre of Genomic Epidemiology and with other web-available programs. They also analysed resistance genes and how they move between bacteria, focusing on mobile genetic elements. The participant also had the opportunity to further analyse their own research data and participated in collaborative discussions where they were given scientific advice and ideas for the work that they can do next. During their stay, the participant also attended some sessions of a course where they were taught to use some tools for the analysis of WGS data.

For further details and complete testimonials, view the STM case study.

"...I not only learned a lot, but I also met colleagues from other parts of the world who work on similar tasks and with whom I have been able to share ideas and impressions. I had the opportunity to live a motivating experience both academically and personally. It is enriching to know other places with different cultures and different way of working. Therefore, I would like to thank OHEJP for the grant and members of the DTU for helping me and making me feel comfortable in an unknown place..."

Irene Aldea Ramos, VISAVET-UCM

STM 4: Skills development focused on development of a framework for reporting outbreak investigations using consumer purchase data

Home Institute: FHI, Norway
Mission Hosting Institute: SSI, Denmark
Duration of mission: 1 week

Aim of mission: The aim of this mission was to work towards developing a framework for reporting outbreak investigations using consumer purchase data. During this mission, the participant also reviewed the current and previous use of purchase data and the potential of its future use. The participant worked with collaborative colleagues at SSI on a description of "best practice" for using purchase data with the aim of harmonising the use of this kind of surveillance data amongst the European countries. In addition, the collaborative team started drafting an opinion paper describing the method and existing barriers for the benefit of new users and with the hope that these barriers eventually can be overcome.

For further details and complete testimonials, view the STM case study.

"...SSI has previous experience with using consumer purchase data in several outbreak investigations... it was very useful to become a part of their team for a week and work together with the highly skilled epidemiologists on developing the use of this tool further..."

Solveig Jore, FHI

One Health EJP Communications

IMAGE: PXFUEL

COMMUNICATING SUCCESS

The Communications Team sits centrally to the OHEJP Consortium in WP1, delivering communications and coordinating activities effectively to ensure the OHEJP achieves its goals and fulfils its potential.

A Communications Strategy and Plan was developed in Year 1: its purpose, to set out the OHEJP vision, aims and objectives, and to define how to effectively communicate these to our segmented target audience groups.

Both the Strategy and Plan have allowed us to better structure and control information flow to fully exploit the output and scientific outcomes of the OHEJP.

In Year 2, as the OHEJP became further established, the Communications Team identified new opportunities to support the consortium and engage our audiences with up-to-date accurate messages. This enabled us to consistently grow affiliation with the internal and external audiences.

Communications Activities

Powerful, appropriate communication has always been about getting people to pay attention. Every day, people are inundated with a substantial amount of data; the Communications Team identified and prioritised what we wanted to communicate and when. This was key to ensuring the most current, concise information was presented effectively and had the biggest possible reach to the appropriate target audiences.

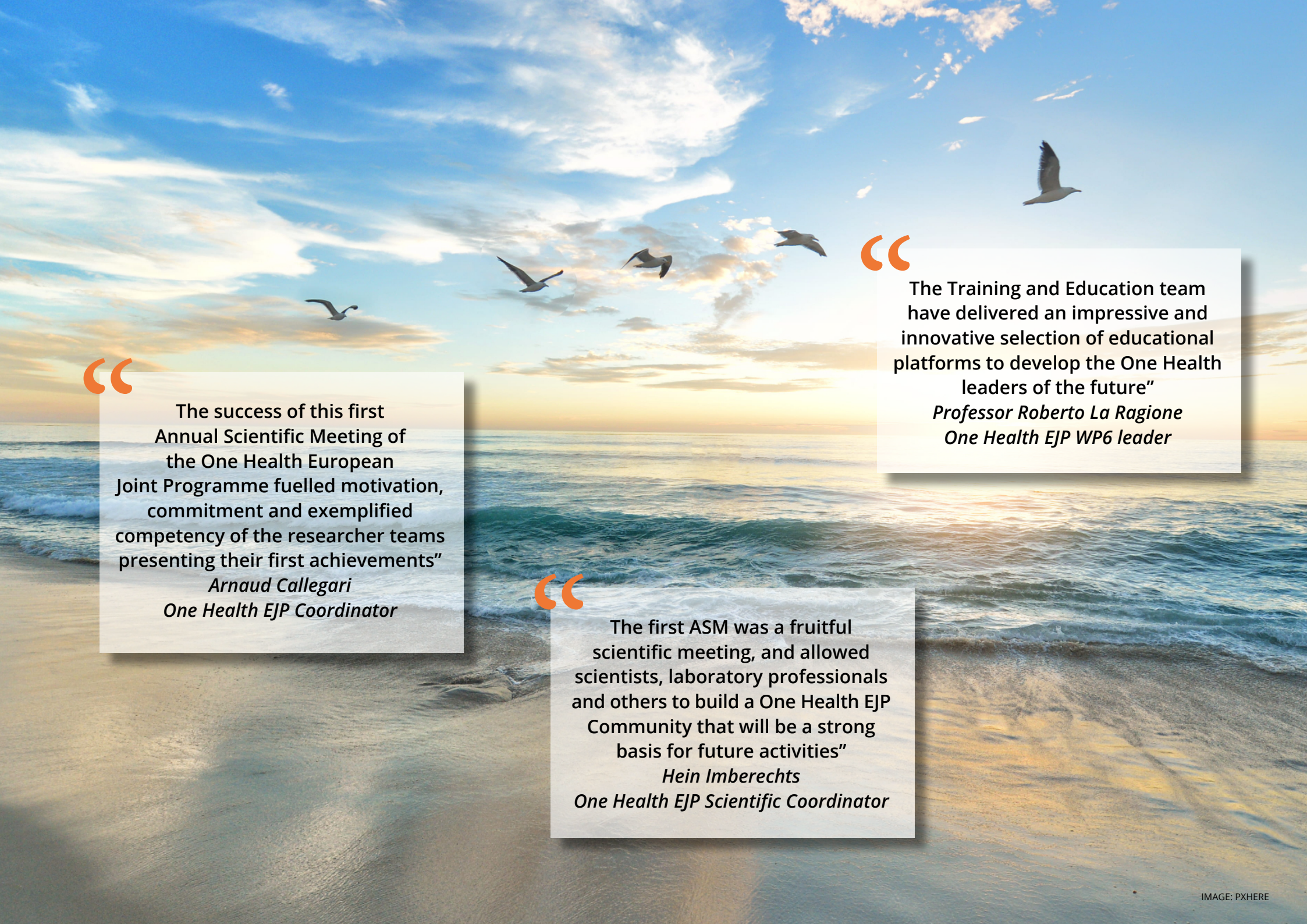
Audience Growth

We have seen consistent growth in the key communication areas:

- Social media: an 80% increase in Twitter impressions and 1346% in LinkedIn impressions compared to the same time previous year.
- E-newsletter: the audience increased by 181% in 12 months.
- Website: the number of users increased by 122% compared to the same time previous year and the number of page views increased by 53%.

The communication channels and methods we used were shown to be effective in reaching and resonating with our target audiences.

IMAGE: PXHERE



"The success of this first Annual Scientific Meeting of the One Health European Joint Programme fuelled motivation, commitment and exemplified competency of the researcher teams presenting their first achievements"

Arnaud Callegari
One Health EJP Coordinator

"The Training and Education team have delivered an impressive and innovative selection of educational platforms to develop the One Health leaders of the future"

Professor Roberto La Ragione
One Health EJP WP6 leader

"The first ASM was a fruitful scientific meeting, and allowed scientists, laboratory professionals and others to build a One Health EJP Community that will be a strong basis for future activities"

Hein Imberechts
One Health EJP Scientific Coordinator

IMAGE: PXHERE