

STSM Report

REFERENCE: Short Term Scientific Mission, COST TD1404 NEOH

Beneficiary

Luis Pedro Carmo

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Host

Liza Rosenbaum Nielsen

Professor with special duties in Disease Control and Prevention

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University of Copenhagen

Denmark

Period: from 01/10/2015 to 31/10/2015

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1. Purpose of the visit

The objectives of this Short Term Scientific Mission (STSM) were: 1) to gain a deep insight on the Danish systems that are in place regarding the usage and resistance of antimicrobials in food-producing animals; 2) to get access to detailed Danish data on antimicrobial usage and resistance in livestock; 3) to discuss with Danish experts the systematic review on the relationship between antimicrobial use in livestock and development of resistance in food-producing animals, animal products and humans.

2. Description of the work carried out

The grantee attended the One Health International Summer Course organized by University of Copenhagen and the Technical University of Denmark. This course was of great value to further improve the knowledge and understanding of the One Health concept. Other NEOH partners were involved in the course for teaching and discussions, which facilitated networking. During the course, the Danish Agriculture & Food Council was visited for presentations of the agriculture sector's view on the antimicrobial resistance challenges, and discussions were therefore possible with several of the essential stakeholders during the STSM.

Several meetings were held with experts from the Danish Integrated Antimicrobial Resistance Monitoring and Research Programme (DANMAP), the VetStat database (database on the usage of antimicrobials in animal species) and the University of Copenhagen Research Centre for Control of

Antimicrobial Resistance (UC-CARE). These meetings were a cornerstone to gain a deep knowledge of the Danish system on antimicrobial usage and resistance for food-producing animals. The grantee could also attend one meeting in a group of researchers from multiple institutions working with data from the VetStat database. This meeting was of great use for gaining a profound insight of the characteristics of the Danish prescription monitoring system for animal antimicrobial usage, its strong points and drawbacks.

Two studies were designed and initiated during this period: 1) an investigation of the ecological association on a national level between livestock antimicrobial usage and the prevalence and patterns of resistance of bacteriological isolates. This will be done in the form of a time-series analysis; 2) an analysis of the association between antimicrobial usage in specific farms and the isolates collected on DANMAP's scope from those same farms. The methodologies for both analyses were discussed and data was shared with the grantee together with an explanation of the dataset contents and structure. In the ambit of the grantee's Ph.D. project, an expert elicitation involving three countries (Denmark, Portugal and Switzerland) was initiated in August 2015. The objective of this project is to understand the usage of antimicrobials from the veterinarians' perspective as well as to describe the usage patterns of specific substances throughout the production cycles of the most relevant food-producing industries (broilers, swine, dairy cattle and slaughter cattle). The comparison between the countries might help us to further understand the discrepancies on antimicrobial usage between European countries. Despite this project falling outside the main objectives of the STSM, it was of relevance for the grantee to comprehend some idiosyncrasies with respect to the key components on the chain of antibiotic usage in livestock production and the role of the veterinarians on it. The results of this study might be interesting for governance purposes related to antimicrobial usage.

During the STSM the grantee also worked on the systematic review (currently in the full-text screening process) that intends to analyse the link between the usage of antimicrobials in livestock and the development of resistance in food-producing animals, animal products and humans. Danish experts working on antimicrobial usage and resistance were contacted to participate on the search verification process. This procedure is meant to identify further literature on the research topic, namely grey literature (such as theses or national reports) that might be difficult to identify through electronic databases.

The grantee also contributed (as 2nd author) to a poster about the NEOH COST Action and framework presented at the European College of Veterinary Public Health (ECVPH) annual meeting that took place in Belgrade, Serbia (October 2015). The poster was entitled "Transdisciplinary collaboration across Europe to promote Global Health: Network for Evaluation of One Health (NEOH)" (Attachment 1). This helped to further disseminate the NEOH project within the scientific community. The poster won the "Roberto Chizzolini Memorial Poster Prize 2015" for the best conference resident poster. Concomitantly with the grantee's stay, Dr. Simon Ruëgg (WP1 co-leader in NEOH) was in Denmark for an STSM at the University of Copenhagen. It was then possible to discuss possible contributions for the NEOH handbook with Dr. Ruëgg and Professor Liza Rosenbaum Nielsen. This has led to the grantee being co-author on a paper currently in the writing process for submission to Lancet about evaluation of One Health.

3. Description of the main results obtained

The most relevant result of this STSM relates to the knowledge developed with respect to the VetStat database and the DANMAP programme. A meeting is being planned to transmit the knowledge that the grantee acquired to the Swiss Authorities.

Moreover, as initially planned, it was possible to obtain detailed data from VetStat database, as well as from the microbiological samples collected in the scope of DANMAP's programme. Specificities of the data were discussed with experts on these databases and methods for future analysis were also debated.

With regards to the systematic review, it was possible to better define the including/excluding criteria for the full text-screening. This process was also initiated during this STSM. Additionally, it was possible to assemble some manuscripts that were not available at the University of Bern databases. Some feedback was collected and additional manuscripts were identified by Danish experts on the matter.

Dissemination of knowledge about One Health evaluation and the NEOH COST Action was successfully achieved, and a scientific manuscript springing out of the NEOH consortium is currently in process.

4. Future collaboration with host institution

On the scope of several projects, the grantee will continue to collaborate with the University of Copenhagen (Professor Liza Rosenbaum Nielsen), the Danish Agriculture & Food Council (Adjunct Professor Lis Alban), the Technical University of Denmark (several researchers) and DANMAP (several researchers). A follow-up meeting with Liza Rosenbaum Nielsen and Lis Alban will be scheduled for March 2016 with the objective of discussing the progress of the joint projects. Furthermore, a contribution for the NEOH handbook will be prepared.

5. Projected publications resulting or anticipated to result from the STSM

Within the scope of the grantee's Ph.D. programme several scientific publications are to be expected, two of them strictly related to the projects that were conducted during this stay.

As mentioned previously, the collaboration with Liza Rosenbaum Nielsen might also provide a contribution for the NEOH handbook.

6. Confirmation by the host of the successful execution of the mission

The STSM was carried out as planned and contributed substantially to the implementation of the COST Action and its dissemination. Also important discussions with DANMAP, VETStat and UC-Care participants were beneficial for future potential evaluation of these One Health initiatives in NEOH.

7. Financial summary

Expenses	Total expenses in EUR	% covered by NEOH grant (EUR)
Travel	225 EUR	88.9 % (200 EUR)
Accommodation	1532 EUR	39.2 % (600 EUR)
Consumables (meals)	1500 EUR	40.0 % (600 EUR)
Total	3257 EUR	43.0% (1400 EUR)

8. Other comments

I would like to thank Professor Liza Rosenbaum Nielsen for the indispensable help provided during my stay for the success not only of this STSM, but also of all the projects that were carried out during this exchange period.

Signatures

Date 01 November 2015

Grantee

Luís Pedro Carmo

Host 3/11-2015

Liza Rosenbaum Nielsen

Transdisciplinary collaboration across Europe to promote Global Health: Network for Evaluation of One Health (NEOH)



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Background

- A One Health (OH) approach requires **transdisciplinary** responses to societal challenges by applying natural and social sciences to human, animal health and environmental sustainability
- There is a need for a **standardised** methodology to **evaluate** OH initiatives systematically and to **quantify** the potential advantages of such an holistic approach
- NEOH is an **open network** that brings together people from a wide range of disciplines (e.g. ecology, economics, epidemiology, human and animal health) and with varying expertise and experience who have an interest in One Health and evaluation
- 22 COST countries have joined the network to date

Aims of NEOH and expected outcomes

- Provide guidance to evaluate One Health initiatives in a systematic and comparable manner
- Generate scientific evidence on the efficiency and cost-effectiveness of OH activities
- Provide information for decision-makers to support the development of sustainable policies, and to efficiently allocate resources

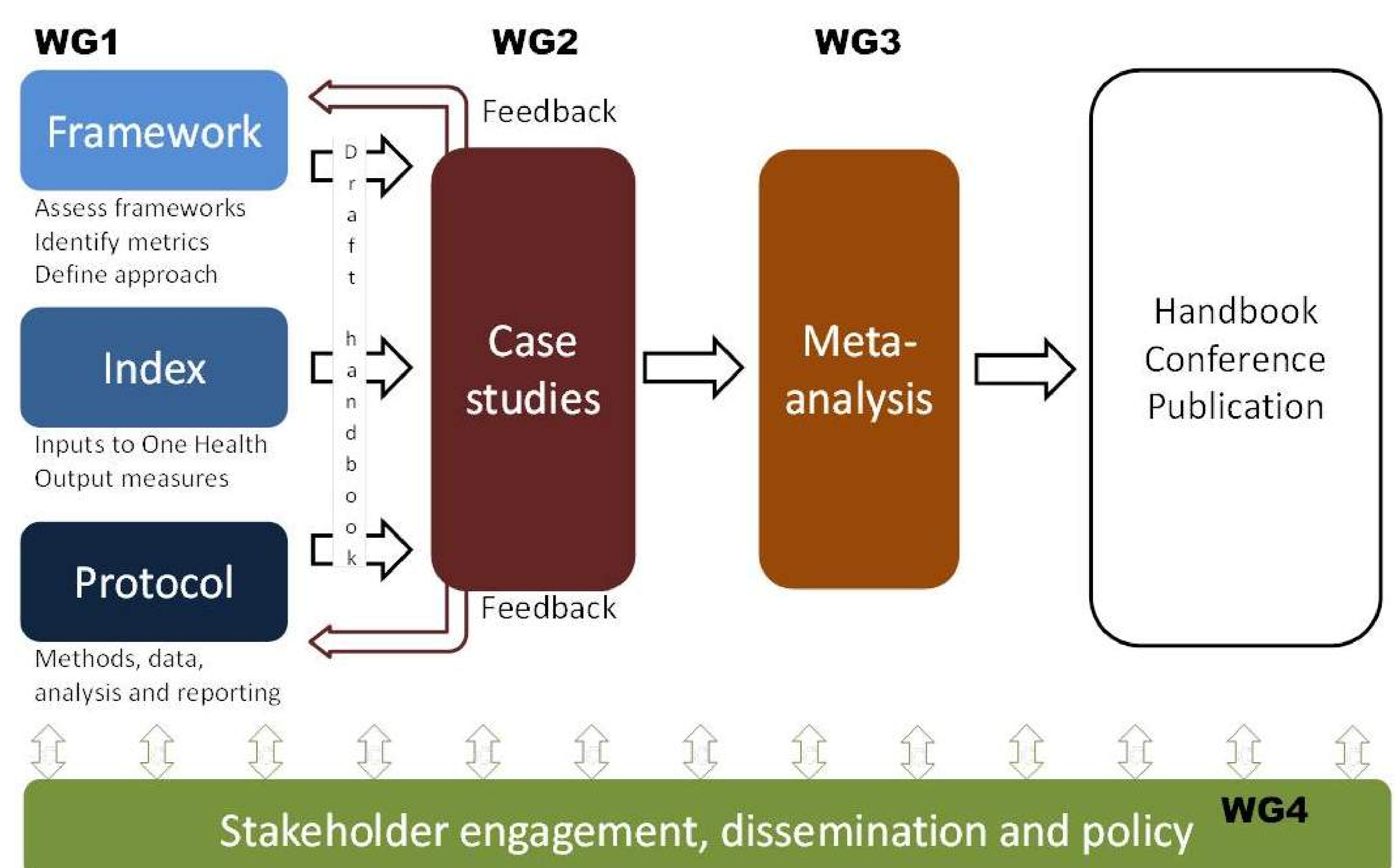
Methodology

Participants are working together in four working groups (WG):

- **WG1** - developing a framework, index and protocol to be included in a **handbook**
- **WG2** - applying the handbook in selected **case studies** using available primary and secondary datasets stemming from ongoing OH initiatives including but not limited to research projects, surveillance or disease control activities, educational programmes
- **WG3** - conducting a **meta-analysis** of the available case-study results to facilitate international comparison and elaborate policy recommendations
- **WG4** - seeking **dialogue** with national governments, NGOs, research organizations and industry throughout the project to ensure that the evidence produced addresses stakeholders and decision-makers' needs

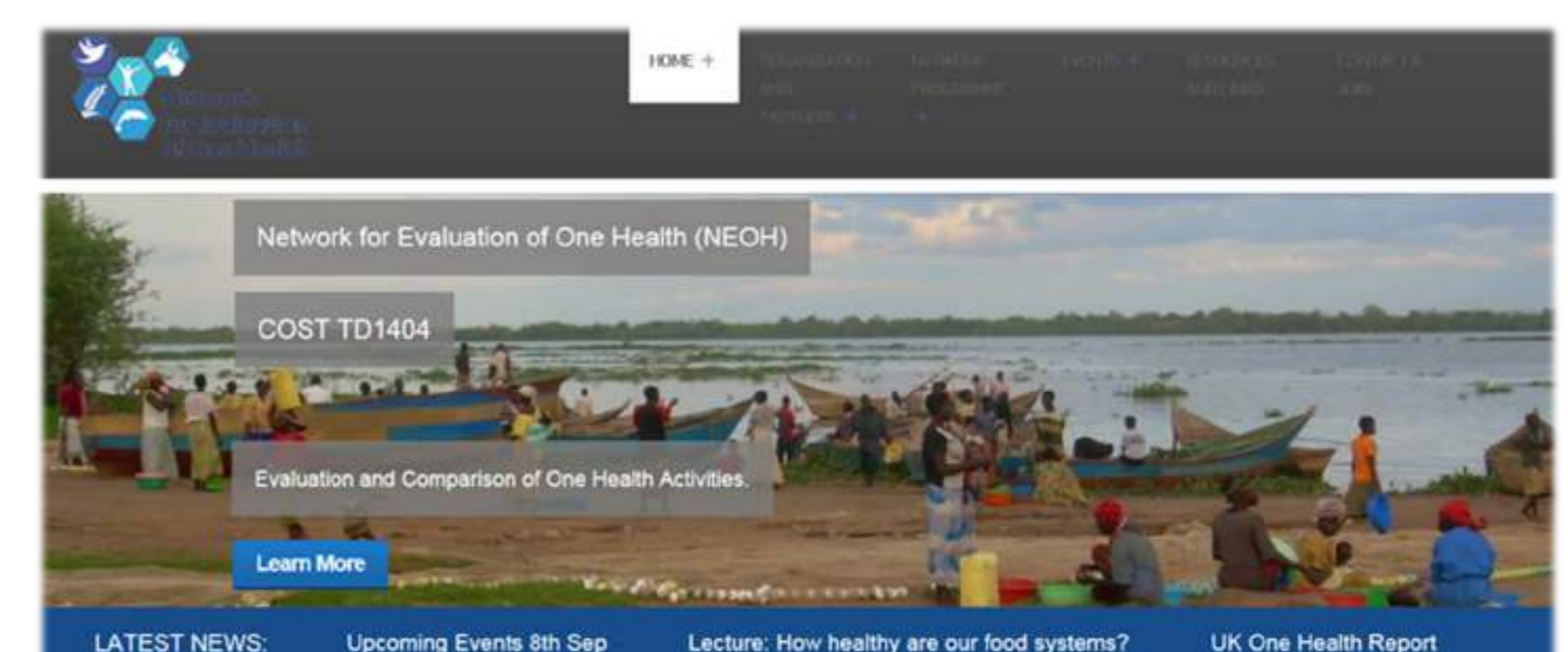
The network provides financial support to short-term-scientific-missions, training schools, working group meetings, stakeholder meetings and dissemination activities to facilitate the work.

Working groups



Final Notes

- NEOH is in its first year of operation and the activities to date focused on establishing the network, the elaboration of the handbook content and structure, as well as dissemination and engagement activities.
- NEOH can be joined by (a) any researchers, engineers or scholars from all COST Member Countries and its Cooperating State; (b) researchers from institutions in Near Neighbour Countries, International Partner Countries and International Organisations on the basis of mutual benefit.
- To **know more** about the Network and COST Action and to learn **how to join**, please visit <http://neoh.onehealthglobal.net/>



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