

ADVANCED ONE HEALTH (AHE 812)

(Course leader: Mieke Stevens)

The module Advanced One Health builds on the module One Health Basic Concepts (OHB 801) by assisting students to evaluate and plan One Health implementation.

Critical to the successful establishment of One Health principles in institutions as well as various levels of governance, is our ability to identify gaps in the implementation of One Health followed by our ability to devise strategies to fill the gaps. The application of One Health in practice depends on a health practitioner's ability to take active steps towards implementing One Health principles in institutions and governance structures, whether at the local, regional or international level. In this module students will be expected to become familiar with criteria for One Health evaluation, assess their validity and analyse reported One Health initiatives and approaches by means of literature-based research, after which gaps in One Health implementation must be clearly defined. Working alone and in groups, students will develop their own and peer review each other's strategic and operational One health plans. Based on the gaps identified, students will be expected to devise practical steps and actions by means of a provided tool which they could take to address the identified gaps in order to ensure implementation of One Health. Based on gaps identified, they will develop and peer-review research plans to address any relevant gaps.

NUMBER OF CREDITS

4 ECTS

MODE OF STUDY

The educational approach in this module is entirely web-based distance learning. Self-directed learning by the student is therefore essential. Although there is some required reading material, much of the module will depend on the student's own broader reading and research in order to complete an assignment successfully. The learning experience will be complemented with activities that include discussions, written assignments and group work by means of the interactive tools in ClickUP. It is the student responsibility to actively participate in these. The students are also encouraged to interact with the fellow students, to stimulate some creative thinking! Assignments submitted should be the students own work, or in the case of group work, the collective work of the group members

LEARNING OBJECTIVES

The objective of this module is to give the student a multidisciplinary view (One Health) of the concepts and principles of integrated human, animal and ecosystem health and management. There will be a special focus on understanding the relationship between ecosystem health and infectious/parasitic diseases of animals and humans (zoonoses) in order to improve disease control policies, ecosystem sustainability, food security and rural development.

Students should be able to:

- Discuss the criteria that define/form the basis of a One Health approach.
- Critically evaluate the 'One-healthness' of approaches that claim to implement One Health.

- Describe the criteria for evaluating the effectiveness of One Health approaches.
- Recognise the value that non-health issues can add to a One Health approach.
- Describe the identification and selection of stakeholders in a One Health initiative
- Demonstrate knowledge of the roles of the stakeholders identified
- Critically analyse criteria used to evaluate 'one-healthness' of a strategic and operational plan for a One Health intervention
- Propose a strategic and operational plan for a One Health intervention for a theme provided
- Critically analyse proposed strategic and operational plans according to the criteria provided
- Collaborate with colleagues to reach consensus on a strategic and operational plan
- Propose a research plan to address any gaps or areas where knowledge is lacking.

CONTENT

The content of the module is distributed between various tasks to pace your learning. The due dates for the assignments can be found in clickUP by clicking on the “Schedule” link. To gain most benefit from this module it is imperative to adhere to the schedule. Please note that although there are a number of activities that are not graded, full participation in those activities is compulsory as they are a vital part of your learning experience. Failure to participate will result in deduction of 5-10 marks from your final grade, depending on your level of participation.

Introductory activities (Not graded)
<p>Introductory Activity 0.1: Discussion</p> <p>Introduce yourself on the discussion forum titled “Welcome”.</p>
<p>Introductory Activity 0.2: Blog entry: Your work environment and One Health</p> <p>Post a blog in which you identify one example of a One Health challenge, if possible in the context of your own work but if this is not possible, from the field of your broader interests in the context of the livestock-wildlife-human interface.</p>
Theme 1. Getting to know One Health in real life: identify good and bad examples and evaluate One Health challenges
<p>Activity 1.1: Prescribed Reading (not graded)</p> <p>Read all the material supplied for Theme 1.</p> <p>This includes the course notes and all of the prescribed reading material for Theme 1 on the Library Reference page.</p>
Activity 1.2: Consider the following list of 15 topics and classify them as One Health or non-One Health issues (not graded)
<p>Activity 1.3 (graded): Written assignment</p> <p>Based on activity 3.2, select a bad example of a One Health approach, identify the gaps in the approach and post a short report (maximum 250 words)</p>
<p>Activity 1.4 (not graded): Facilitated discussion</p> <p>Based on your reading of the paper by Baum et al., 2017 (prescribed reading), participate in the facilitated online discussion on the following topic:</p>

How do we measure the successful implementation of One Health?

Activity 1.5 (graded): Written assignment

Identify a problem that can be/has been approached using a single discipline or a One Health approach and compare the advantages and disadvantages of each approach in a table. Post the table, together with a short explanatory document (maximum **250 words**).

Activity 1.6 (not graded):

Find a relevant paper on the non-health added value of a one health approach.

Theme 2. Stakeholder analysis

Activity 2.1 (not graded)

Read the course notes, which include an example of a stakeholder analysis, and prescribed material for Theme 2.

Activity 2.2 (graded): Written assignment

Select a case study from the list of Prescribed reading provided and post a stakeholder analysis, including a diagram on a power point, using the template provided.

Activity 2.3 (graded): Facilitated online discussion

Based on a prescribed peer-reviewed article, participate in a facilitated online discussion on the appropriateness of the stakeholder selection, the contribution they were likely to make, and whether you have identified any important omissions.

Theme 3. Strategic and operational plan (group work for Themes 3 and 4 will be carried out via a forum established for the purpose)

Activity 3.1 Prescribed reading (not graded)

Read the course notes and the prescribed reading for Theme 3, as well as relevant articles from the prescribed reading for Themes 1 and 2, with a view to preparing a strategic and operational plan for a One Health initiative.

Activity 3.2 (graded): Written assignment

Analyse the six criteria proposed in the APEC OH action plan in terms of the application of One Health. Post a blog of not more **250 words** on whether the criteria are appropriate for One Health, whether there are any gaps, and if so how they could be addressed. Peer review each of the other participants' blogs and post your review as a comment.

Activity 3.3 (not graded): Group exercise

Two topics and two groups have been selected by the coordinator. A topic will be assigned to each participant in the module by e-mail, which will also indicate the group to which you have been assigned. Write the outline of a strategic and operational plan on the topic that has been assigned to you. Share your plan with the other members of your group via a forum, read each of the plans submitted by your group, and come to a consensus within your group on a strategic and operational plan. Share this plan with the other group for them to peer review it.

Activity 3.3 (graded): Written assignment

Each group to post their plan and peer review on ClickUP for review and grading by the coordinator.

Theme 4. Research plan**Activity 4.1 Prescribed reading (not graded)**

Read the course notes and prescribed reading for Theme 4.

Activity 4.2 (not graded): Written assignment

Based on gaps identified in the operational plan, write the outline of a research plan to address those gaps.

Activity 4.3 (graded): Written assignment

Share your plan with other members of your group and reach consensus on a joint plan for your group. Post the plan as a written assignment.

TEACHING AND LEARNING METHODS

The educational approach is for the majority of the module web-based distance learning. Self-directed learning by the student is therefore essential. Although there is some reading material recommended, much of the facilitation of learning in this module will be done through the interactive tools on an online platform, in particular through audio recorded lectures, on-line discussions and other co-operative methods. It is the students` responsibility to actively participate in these.

ASSESSMENT

To pass this module, students must complete and submit all assignments/exercises. One assignment is foreseen for each theme. The final score for the module will be based on the scores obtained for each of these assignments.

Theme 1: Get to know One Health in real life: good and bad examples and evaluation of One Health strategies

- A bad example of a One Health approach is analysed and the results, with reasons, are presented in a report.
- The advantages and disadvantages of using a single or multidisciplinary approach to a specific problem are compared in a table and are presented together with a short explanatory report.

Theme 2. Stakeholder analysis

- The selected stakeholders for a particular One Health initiative are assigned to different categories according to their roles and the results are presented in a table and a diagram, using a template provided.

- The composition and roles of the stakeholders described in a prescribed peer reviewed article are analysed in an online discussion forum.

Theme 3. Strategic and operational plan

- The six criteria proposed in the APEC OH action plan are analysed in a blog and peer reviewed by all of the colleagues using the Comments facility.
- Working in two groups to which they are assigned, a consensus strategic and operational plan for a One Health intervention on a topic provided will be prepared, peer reviewed by the other group and posted, with the review, as a written assignment.

Theme 4. Research plan

- Based on gaps identified by peer review or areas where research is required to support the intervention, each group will develop a consensus research plan and post it as a written assignment.

Activity	Marks (%)
Activity 1.3: Written assignment	15
Activity 1.5: Written assignment	15
Activity 2.2: Written assignment	15
Activity 2.3: Online discussion	10
Activity 3.2: Blog	15
Activity 3.4: Written assignment (group exercise)	15
Activity 4.3: Written assignment (group exercise)	15
Total	100

ADMISSION REQUIREMENTS

Identical to the admission requirements of the MSc in Tropical Animal Health.

SELECTION CRITERIA

Identical to the selection criteria of the MSc in Tropical Animal Health.

READING MATERIAL

Mandatory reading

Theme 1

- Baum, S.E., et al 2017. Evaluating One Health: are we demonstrating effectiveness? One Health, 3, 5-10.

- [Centers for Disease Control and Prevention, 2010. Operationalizing 'One Health': A policy perspective - Taking stock and shaping an implementation roadmap. Meeting Overview, National Center for Emerging and Zoonotic Infectious Diseases, CDC, Stone Mountain, Georgia. May 4-6, 2010.](#)
- [Conrad, P.A. et al 2009. Evolution of a transdisciplinary 'One Medicine - One Health' approach to global health education at the University of California, Davis. Preventive Veterinary Medicine, 92, 268 - 274.](#)
- [Degeling, C., et al 2015. Implementing a One Health approach to emerging infectious disease: reflections on the socio-political, ethical and legal dimensions. BMC Public Health, 15: 1307 \(11 pages\).](#)
- [Johnson, I., et al 2018. The challenges of implementing an integrated One Health surveillance system in Australia. Zoonoses Public Health, 65, e229-e236.](#)
- Kahn, L. H. 2012. The Challenges of Implementing One Health. A policy position paper prepared for presentation at the conference on Emerging and Persistent Infectious Diseases (EPID): Focus on the Societal and Economic Context, convened by the Institute on Science for Global Policy (ISGP) July 8-11, 2012, at George Mason University, Fairfax, Virginia.
- [Kelly, T.R., et al 2017. One health proof of concept: bringing a transdisciplinary approach to surveillance for zoonotic viruses at the human-wild animal interface. Preventive Veterinary Medicine, 137, 112-118.](#)
- [Rüegg, S.R., et al 2017. A blueprint to evaluate One Health. Frontiers in Public Health, 5, Article 20 \(5 pages\).](#)

Theme 2

- [Kimani, T., et al 2016. One Health stakeholder and institutional analysis in Kenya. Infection Ecology and Epidemiology, 6: 31191 \(13 pages\).](#)
- [Mazet, J.A.K., et al 2014. Stakeholders in One Health. Revue scientifique et technique, Office International des Epizooties, 33\(2\), 443-452.](#)

Theme 3

- Asia-Pacific Economic Cooperation, 2011. One Health Action Plan. A Framework to assist APEC economies strengthen cross-sectoral networks and functioning against the threat of emerging and zoonotic diseases. September 2012.
- Brookes, V.J., et al 2015. Preparedness for emerging infectious diseases: pathways from anticipation to action. Epidemiology and Infection, 143,

Theme 4

- [Coker, R., et al 2011. Towards a conceptual framework to support one-health research for policy on emerging zoonoses. Lancet Infectious Diseases, 11, 326-331. DOI: 10.1016/S1473-3099\(10\)70312-1.](#)
- [Lebov, J., et al 2017. A framework for One Health research. One Health, 3, 44-50.](#)

- [Zinsstag, J., et al 2009. Towards a 'One Health' research and application tool box. Veterinaria Italiana, 45 \(1\), 121-133.](#)

Recommended reading

Theme 1

- World Health Organization, 2015. Global Action Plan on Antimicrobial Resistance. World Health Organization, Geneva, Switzerland. <https://www.who.int/antimicrobial-resistance/global-action-plan/en/>.
- [Gabriël, S., et al 2017. Control of Taenia solium taeniasis/cycticercosis: the best way forward for sub-Saharan Africa? Acta Tropica, 165, 252-260.](#)
- Benelli, G., et al 2018. Mosquito control with green nanopesticides: towards the One Health approach? A review of non-target effects. Environmental Science and Pollution Research, 25(11), 10184-10206.
- [Lorenz, V., et al 2014. Malaria vaccine development and how external forces shape it: an overview. International Journal of Environmental Research and Public Health, 11, 6791-6087.](#)
- Pastoret, P.-P., et al 2014. Eradicating rabies at source. Revue scientifique et technique, Office International des Epizooties, 33(2), 509-519.
- [Stark, K.D., et al 2015. One Health surveillance - more than a buzz word? Preventive Veterinary Medicine, 120\(1\), 124-130.](#)
- [Rock, M.J., et al 2017. Dog-bites, rabies and One Health: towards improved coordination in research, policy and practice. Social Science and Medicine, 187, 126-133.](#)
- [Anon, 2018. The Progressive Control Pathway for Foot and Mouth Disease Control \(PCP-FMD\). Principles, Stage Descriptions and Standards \(2nd edn\). FAO/OIE/GF-TADS/EU-FMD.](#)
- [Miguel, E., et al 2014. Characterising African tick communities at a livestock-wildlife interface using repeated sampling protocols and models. Acta Tropica, 138, 5-14.](#)
- Michel, A.L., 2014. Improving specific disease outcomes through a One Health approach - tuberculosis. Revue scientifique et technique, Office International des Vâpizooties, 33(2), 583-592.
- [Nabarro, D. & Wannous, C., 2014. The potential contribution of livestock to food and nutrition security: the application of the One Health approach in livestock policy and practice. Revue scientifique et technique, Office International des vâpizooties, 33\(2\), 475-485.](#)
- [Bengis, R.G. & Frean, J., 2014. Anthrax as an example of the One Health concept. Revue scientifique et technique, Office International des epizooties, 33\(2\), 593-604.](#)
- [Beineke, A., et al 2015. Cross-species transmission of canine distemper virus - an update. One Health, 1, 49-59.](#)
- [Dantas-Torres, F., et al 2012. Ticks and tick-borne diseases: A One Health perspective. Trends in Parasitology, 28\(10\), 437-446.](#)

- [Dorjee, S., et al 2016. One-health simulation modelling: a case study of influenza spread between human and swine populations using NAADSM. *Transboundary and Emerging Diseases*, 63, 36-55.](#)
- [Sahlu, I., et al 2019. Estimating the association between being seropositive for cysticercosis and the prevalence of epilepsy and severe chronic headaches in 60 villages of rural Burkina Faso. *PLoS Neglected Tropical Diseases*, 13\(1\): e0007101 \(15 pages\).](#)

One health surveillance

- Bisson, I.-A., et al 2015. Early detection of emerging zoonotic diseases with animal morbidity and mortality monitoring. *EcoHealth*, 12, 98-103.
- Darea, F. & Vial, F., 2016. Animal health syndromic surveillance: a systematic literature review of the progress in the last 5 years (2011-2016). *Veterinary Medicine: Research and Reports*, 7, 157-170.
- [Mariner, J.C., et al 2014. Experience in participatory surveillance and community-based reporting systems for H5N1 highly pathogenic avian influenza: a case study approach. *EcoHealth*, 11, 22-35.](#)
- [Queenan, K., et al 2017. Using local language syndromic terminology in participatory epidemiology: lessons for One Health practitioners among the Maasai of Ngorongoro, Tanzania. *Preventive Veterinary Medicine*, 139, 42-49.](#)
- [Vial, F. & Berezowski, J., 2015. A practical approach to designing syndromic surveillance systems for livestock and poultry. *Preventive Veterinary Medicine*, 120, 27-38.](#)

Other recommended references:

- [Alders, R., et al 2014. Using a One Health approach to promoting food and nutrition security in Tanzania and Zambia. *Planet@Risk*, 2\(3\), Special issue on One Health \(Part I/II\), 187-190.](#)
- [Aljofan, M., 2013. Hendra and Nipah infection: emerging paramyxoviruses. *Virus Research*, 177, 119-126.](#)
- [Chua, K.B., 2003. Nipah virus outbreak in Malaysia. *Journal of Clinical Virology*, 26, 265-275.](#)
- Green, B.L., 2007. The missing calculation: the human cost. *Veterinaria italiana*, 43(2), 299-301.
- Mephram, B., 2001. Foot and mouth disease and British agriculture: ethics in a crisis. *Journal of Agricultural and Environmental Ethics*, 14, 339-347.
- Myers, S.S., et al 2013. Human health impacts of ecosystem alteration. *Proceedings of the National Academy of Sciences (PNAS)*, 110(47), 18753-18760.
- [Scheele, B.C., et al 2019. Amphibian fungal panzootic causes catastrophic and ongoing loss of biodiversity. *Science*, 363, 1459-1463.](#)
- von Dobschuetz, S., et al 2019. Ebola in animals - our knowledge to date: assessing human exposure risks. *International Journal of Infectious Diseases*, 79(51), 1.

Theme 2

Background and examples of stakeholder analyses

- Darea, F., et al 2014. Toward One Health: are public stakeholders aware of the field of animal health? *Infection Ecology and Epidemiology*, 4: 24267 (4 pages). <http://dx.doi.org/10.3402/iee.v4.24267>.
- Mariner, J., not dated, Institutional mapping and One Health institution building. Power Point presentation, https://www.grease-network.org/content/download/4762/35590/version/1/file/One+Health+stakeholders+mapping_Dr+Jeffrey+Mariner.pdf.
- Mekaru, S.R. & Brownstein, J.S., 2014. One Health in social networks and social media. *Revue scientifique et technique, Office International des epizooties*, 33(2), 629-637.
- Marner, T., et al 2014. The value of increasing the role of private individuals and organisations in One Health. *Revue scientifique et technique, Office International des epizooties*, 33(2), 605-613.

Case studies to consider for Activity 2.2

- [Miller, M.A., et al 2019. Fatal tuberculosis in a free-ranging African elephant and One Health implications of human pathogens in wildlife. *Frontiers in Veterinary Science*, 6, Article 18.](#)
- [Muñoz-Prieto, A., et al 2018. Application of the NEOH framework for self-evaluation of One Health elements of a case-study on obesity in European dogs and dog-owners. *Frontiers in Veterinary Science*, 5, Article 163 \(9 pages\).](#)
- [Mwakapeje, E.R., 2017. Prevention, detection and response to anthrax outbreak in Northern Tanzania using One Health approach: a case of Selela ward in Monduli district. *International Journal of One Health*, 3, 66-76. doi: 10.14202/IJOH.2017.66-76.](#)

Theme 3

References relating to multidisciplinary management of an emerging zoonotic disease

- [Aljofan, M., 2013. Hendra and Nipah infection: emerging paramyxoviruses. *Virus Research*, 177, 119-126.](#)
- [Anderson, L.J. & Tong, S., 2010. Update on SARS research and other possibly zoonotic coronaviruses. *International Journal of Antimicrobial Agents*, 36S, S21-S25.](#)
- [Chua, K.B., 2003. Nipah virus outbreak in Malaysia. *Journal of Clinical Virology*, 26, 265-275.](#)
- [Lu, J., et al 2016. A brief historical overview of emerging infectious disease response in China and the need for a One Health approach in future responses. *One Health*, 2, 99-102.](#)
- [Wang, L.-F. & Cramer, G., 2014. Emerging zoonotic viral diseases. *Revue scientifique et technique, Office International des epizooties*, 33\(2\), 569-581.](#)
- Zumla, A., et al 2016 (editorial). [Taking forward a 'One Health' approach for turning the tide against the Middle East respiratory syndrome coronavirus and other zoonotic pathogens with epidemic potential. *International Journal of Infectious Diseases*, 47, 5-9.](#)

References relating to multidisciplinary management of an outbreak of an endemic zoonotic disease

- [Bengis, R.G. & Frean, J., 2014. Anthrax as an example of the One Health concept. *Revue scientifique et technique, Office International des epizooties*, 33\(2\), 593-604.](#)
- [Braae, U.C., et al 2019. Stepwise approach for the control and eventual elimination of *Taenia solium* as a public health problem. *BMC Infectious Diseases*, 19: 182 \(6 pages\).](#)
- Girmay, G., et al 2018. Community-based tsetse fly control minimizes the effect of trypanosomosis on livestock in Metekel zone, Ethiopia. *Tropical Health and Production*, 50, 621-627.
- [Meyer, A., et al 2018. Integrated cost-benefit analysis of tsetse control and herd productivity to inform control programs for animal African trypanosomiasis. *Parasites and Vectors*, 11: 154 \(14 pages\).](#)
- [Mwakapeje, E.R., et al 2017. Prevention, detection and response to anthrax outbreak in Northern Tanzania using One Health approach: a case of Selela ward in Monduli district. *International Journal of One Health*, 3, 66-76.](#)
- [Pastoret, P.-P., Van Gucht, S. & Brochier, B., 2014. Eradicating rabies at source. *Revue scientifique et technique, Office International des Epizooties*, 33\(2\), 509-519.](#)

Theme 4

- Saéz, A.M., et al 2014. Investigating the zoonotic origin of the West African Ebola epidemic. *EMBO Molecular Medicine*, 7, 17-23.
- Websites:
 - CDC - Centers for Disease Control and Prevention: One Health - <https://www.cdc.gov/onehealth/index.html>
 - Operationalizing One Health: The Stone Mountain Meeting - https://www.cdc.gov/onehealth/pdf/atlanta/brief_overview.pdf;
 - Manhattan Principles on 'One World, One Health' - http://www.wcs-ahead.org/manhattan_principles.html;
https://www.afcd.gov.hk/english/quarantine/qua_vb/files/OWOH2.pdf
 - World Organization for Animal Health (OIE) - <http://www.oie.int/en/for-the-media/onehealth/>
 - World Health Organization - <https://www.cdc.gov/onehealth/>
 - <https://www.cordsnetwork.org/wp-content/uploads/2014/04/ehj-cords-supplement.pdf>
 - <https://www.oie.int/doc/ged/D6296.PDF>
 - <https://www.vet.cornell.edu/departments/centers/wildlife-health-cornell>

STAFF INVOLVED

Dr Mieke Stevens – Module coordinator

Dr Chiara Trevisan – Module facilitator

A number of international colleagues are invited to provide recorded lectures, however these change based on the yearly availability and content proposed.