

European Commission One Health Program in Asia: Integrating Education and Action for One Health

Overview

Massey University is implementing a One Health program in four South Asian countries—Afghanistan, Bangladesh, Bhutan and Nepal—from April 2014 to March 2017, funded by the European Commission under the One Health Program in Asia (EuropeAid/133708/C/ACT/Multi; Contract DCI-ASIE/2013/331-217).

The overall objective of this program is to develop a collaborative approach to investigation and control of zoonotic diseases among the human, animal, and wildlife health sectors through education and joint action.

Specific objectives are:

1. To provide formal postgraduate training in human, animal, and wildlife disease epidemiology and develop local language teaching materials for national implementation in Afghanistan, Bangladesh, Bhutan and Nepal;
2. To undertake pilot investigations of zoonoses to determine national priorities based on a range of assessment factors then learn how these approaches can be applied to a wider range of diseases;
3. To build and strengthen collaborative relationships within and between countries by integrating project participants into One Health Hubs that have already been implemented in the Region.

The core of the program is a *One Health Epidemiology Fellowship Program* in which participants from the human health, animal health, and wildlife sectors will undertake Master's degree training in epidemiology and biosecurity, and then apply that training in a collaborative framework to conduct situation assessments and evaluate surveillance and control strategies for priority zoonotic diseases in each country using a multi-sectoral approach. In parallel, Massey University will develop and evaluate software tools to be used by the participants for evaluating appropriate One Health strategies across a broad range of disease epitypes.

A: One Health Epidemiology Fellowship

A *One Health Epidemiology Fellowship* will be undertaken by six (6) participants in each of the four (4) participating countries (24 participants in total), comprising two public health, two animal health and two wildlife health participants.

The participants will undertake the Fellowship program in their home country and will be co-located and work together in multi-sectoral groups within one or two host organisations in each country that will provide a collegial and collaborative work environment and facilitate in-country supervision of Fellowship activities.

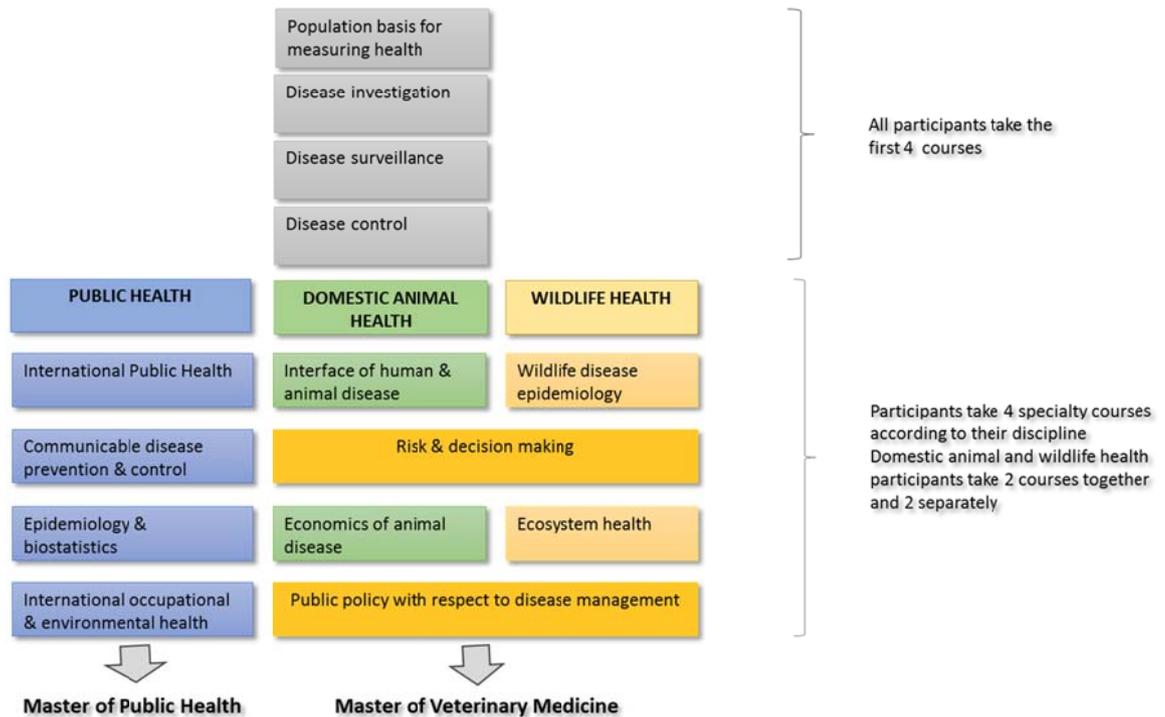
The Fellowship program will run for 24–30 months from September 2014 to February 2017 and will include the following three components:

1. Master’s degree training: MPH (Biosecurity) and MVM (Biosecurity)

Fellows will undertake a postgraduate study program delivered using a combination of on-line learning and face-to-face workshops over a period of approximately 16 months. Public Health participants will study for a Master of Public Health (MPH–Biosecurity) whilst animal and wildlife health participants will study for a Master of Veterinary Medicine (MVM–Biosecurity).

Each Master’s degree program comprises eight papers; four fundamental epidemiology papers common to all, and four specialty papers focussed on the needs of each sector, as outlined below.

MVM/MPH (Biosecurity) Degree Course Structure



2. Applied epidemiology studies and evaluation of zoonotic disease control strategies

In parallel with the Master’s degree training, applied epidemiology studies will be conducted by Fellowship program participants that include situation assessments and evaluation of surveillance and control strategies for selected diseases using a One Health multi-sectoral approach. These studies will provide practical opportunities to apply the knowledge taught in the degree program to real-world disease problems in each country.

The studies will focus on a matrix of 16 diseases representing a broad range of disease epitypes prevalent in the South Asia region. The studies will also test methodologies and software tools that integrate epidemiological and economic analyses as part of a structured policy evaluation system which can be applied nationally and regionally to select appropriate One Health strategies for controlling zoonotic diseases. The matrix of the selected diseases by country is given in Table 1. Each participant will focus on two of the four diseases selected for their country, for which further evaluation and investigation is needed in order to formulate appropriate future control strategies.

These diseases have been chosen to represent a spectrum of the principal epidemiological types (epitypes) of zoonoses and other diseases that require a One Health approach for control. They include diseases that occur in wildlife as well as in domestic animals, vector-borne diseases, and diseases that have strong environmental influences on their occurrence. Two diseases (bracken-fern

poisoning and heavy-metal poisoning) are not zoonoses, but have been chosen as important diseases that affect both people and animals and that would benefit from a One Health approach for control.

This spectrum will enable participants to develop experience and understanding of a range of approaches used for evaluating and controlling different disease epitypes.

Table 1. List of infectious zoonotic diseases and non-infectious disease conditions of animals and humans selected for assessment in each country during the Fellowship Program.

| Country | Disease 1 | Disease 2 | Disease 3 | Disease 4 |
|--------------------|-----------------------|------------------------|--------------|----------------------------------|
| Afghanistan | Tuberculosis | Rabies | Q fever | Zoonotic cutaneous leishmaniasis |
| Bangladesh | Nipah virus | Anthrax | Rabies | Heavy-metal poisoning |
| Bhutan | Anthrax | Bracken-fern poisoning | Fascioliasis | Tuberculosis |
| Nepal | Porcine cysticercosis | Japanese encephalitis | Tuberculosis | Zoonotic visceral leishmaniasis |

Study components

The epidemiology studies and disease control evaluations will comprise three principal components:

a) Situation assessment (collect and review existing data)

Existing disease information will be collated and used to construct the first version of a model for evaluating disease control options. A substantial amount of data is already available for some of these diseases but the data tends to be fragmented. A structured approach to assembling available information in a way that directly relates to assessment of disease risk and control will enable gaps in available data to be clearly identified.

Completion of this exercise will provide baseline data for disease evaluation modelling and demonstrate the nature and scale of missing information, which will be used to design prospective epidemiological studies.

b) Epidemiological studies (collect and analyse new data)

Fellows will be mentored and supported to design and complete prospective epidemiological investigations to obtain as much of the missing information as possible during Years 2 and 3 of the Program.

Fellows will work with collaborating organisations in their country that are involved in researching and/or managing the diseases of interest. These organisations may be able to provide one or more of the following for these projects: access to data on the disease of interest or have networks through which data can be made available; relationships and permissions needed to collect the necessary data; field samples and/or diagnostic support for the projects.

Agreements will be established between Massey University, the host organisation(s) and the collaborating organisations to support Program implementation.

c) Evaluating disease control options

Data analysis activities will take place primarily during Year 3 of the program. Participants in

each country will work in conjunction with expert mentors to carry out analyses of the impact of the four diseases selected for their country on human, animal and wildlife health, and will then evaluate the potential benefits of alternative control strategies using the software and evaluation models developed by Massey University in Year 1. They will be guided in using these tools to evaluate optimal control strategies for the diseases of interest, taking into consideration factors in affected human, animal and wildlife populations.

As much as possible, the participants will work with the government institutions responsible for controlling the diseases of interest, to discuss and evaluate the various disease control strategies using the methodologies and software tools provided. In this way, the knowledge, skills and methodologies developed will serve to strengthen the responsible government institutions as well as amongst the participants of the Fellowship program.

3. Train the trainers and action leaders

Following completion of the Master's degree training, Fellows will work with selected collaborating organisations in their own countries to adapt the teaching materials and epidemiological approaches learned to in-country training needs of public health, animal health and wildlife health workers and students in medical and veterinary schools and other national institutions. This will involve preparing training curricula based on identified needs and adapting appropriate training materials from the teaching resources provided, plus translation into local languages as necessary. This activity will have the following components:

a) Epidemiology training program/curriculum development

- Assess the current knowledge and needs of the target audiences and identify the epidemiological information and training appropriate to meet those needs.
- Develop a curriculum/epidemiology training program appropriate to meet the needs of the trainee audiences.

b) Adaptation of teaching materials

- Prepare epidemiology training materials to deliver the curriculum/training program (eg Powerpoint presentations, exercises, resources, support materials, etc).
- Oversee translation of the materials into local languages if necessary.
- Deliver a training course using these materials.
- Evaluation of training program, training materials and delivery.

B: Development Of Software Tools For Evaluating And Optimising Zoonotic Disease Control Strategies

In parallel with the Fellowship program described above, Massey University will develop HandiManager, a software tool for evaluating and optimising zoonotic disease control strategies for diseases that are already present within a country. This will be developed from HandiResponse ('Human and Animal Disease Incident Response' system), existing software that Massey has developed to evaluate and optimise risk-based surveillance strategies to detect diseases not known to be present within a country or a region but that have a high potential for incursion, such as avian influenza H7N9.

HandiManager will be developed by significantly enhancing HandiResponse for use in situation assessment and for evaluation of alternative surveillance and control policies for endemic zoonotic diseases, including those in which wildlife species are epidemiologically important. Disease transmission

models will be developed for disease epitypes spread through mechanisms other than direct infectious transmission, such as food-borne, environmentally-sourced and vector-borne diseases. The 16 diseases chosen for study include examples of all these epitypes. The enhanced tool will be used by the Fellows to conduct comprehensive socio-economic assessments of disease control strategies for each disease, using data collected on the four focal diseases in their country.

C: Building Strong Cross-Sectoral Networks

One Health Hubs in each country and a regional One Health Network–South Asia have been established by Massey University under a previous EC-funded program completed in early 2014. Fellows will work with the host and collaborating organisations in each country to further build and strengthen these networks and cross-sectoral collaboration at national and regional levels.

Program activities will be coordinated, managed and communicated using *Hubnet*, an online communication and collaboration platform serving the existing One Health Hubs and the One Health Network–South Asia. *Hubnet* will also provide a core vehicle for the dissemination of new information within and between the participating countries, and to other countries that are part of the Network.

Hubnet provides a useful platform to support communication, collaboration and enhance information flow between sectors within and between countries.

Expected Results Of The Program

Through participation in the program, people completing the Fellowship will have contributed to achievement of the following results:

1. Completion of theoretical and applied postgraduate training in epidemiology and biosecurity by six people from the human health, animal health and wildlife sectors in each of the four participating countries, with experience gained working in a One Health cross-sectoral environment.
2. Adaptation of curricula and teaching materials to extend education in One Health approaches to managing emerging and endemic diseases to wider audiences in national languages in each country.
3. Development and validation of an approach for disease situation assessment and evaluation of control policies, for animal health problems which require a One Health approach to solve.
4. Furthering national and regional collaboration on the adoption of a One Health approach by strengthening the One Health Hubs and the regional One Health Network–South Asia, and the use of Hubnet as a vehicle for communication and collaboration within and between countries.
5. Publication of scientific papers reporting results of the studies undertaken, both with respect to the specific diseases investigated and with respect to the methods used and the software developed.
6. Improved health and welfare of people exposed to the risk of infection with zoonotic and emerging diseases, especially rural and peri-urban disadvantaged people who are most at risk.

Contact person:

Dr Peter Jolly

Director, International Development Group
Institute of Veterinary, Animal & Biomedical Sciences
Massey University, Palmerston North, New Zealand
Email: p.d.jolly@massey.ac.nz

This document has been produced with the financial assistance of the European Union. The contents of this document are the sole responsibility of Massey University and can under no circumstances be regarded as reflecting the position of the European Union.