

One Health (Infectious Diseases)

MSc



In recent years the One Health paradigm, which recognises the relationship between health and disease in human and animal populations, has become an important focus in both medical and veterinary science. Many diseases can pass between animals and humans, while food production, human diet and community stability are harmed by diseases that infect livestock and wildlife. The One Health approach helps to resolve complex health, social and economic challenges. It is a worldwide, multidisciplinary and collaborative effort to work towards good health for humans, animals and the environment.

Changing environmental, social and agricultural conditions are a threat to animal and human health and welfare. Emerging animal and human diseases emphasise the threat posed by these changes. Significant amongst these are infectious diseases such as zoonotic strains of highly pathogenic avian influenza viruses (H5N1- bird flu and H7N9) currently circulating in the Far East, pandemic human influenza H1N1 (known as swine flu), Ebola and Nipah Viruses and SARS/MERS coronaviruses.

Key academic staff

Professor Richard Kock
Chair in Wildlife Health
and Emerging Diseases,
Department of Pathology
and Pathogen Biology, RVC

Dr Mandy Nevel
Senior Lecturer, Department
of Pathology and Pathogen
Biology, RVC

Dr Jo Lines
Academic Lead, London
School of Hygiene and
Tropical Medicine

The Programme

Our unique Master's course is delivered jointly by the Royal Veterinary College (RVC) and London School of Hygiene and Tropical Medicine (LSHTM). Participants spend two terms at the RVC and LSHTM in central London, followed by a four-month research project.

The programme addresses a range of topics under the One Health paradigm and includes seven compulsory modules which are outlined overleaf.

Aims

Graduates will be able to respond rapidly to disease outbreaks as well as controlling endemic disease at the interface between humans, animals and the environment. The course will benefit those interested in One Health and disease control, particularly in the developing world. It provides a comprehensive foundation on the principles of diseases in the context of socio-ecological systems, global health and food safety.

Learning Outcomes

At the end of the course you will be able to:

- Approach One Health problems using a trans-disciplinary methodology.
- Understand the origin, context and drivers of infectious disease at the human, animal and environment interface.
- Evaluate impacts of multi-host infections on human, animal and ecosystem health, directly or indirectly via food, vectors or the environment.

- Develop a One Health systems-based approach to disease in surveillance, diagnosis, prevention and control.
- Critically review published literature.
- Design and complete a research project.

Career Impact

A postgraduate degree from the RVC and LSHTM is highly regarded and recognised internationally. This course is one of very few face-to-face MSc One Health courses designed to develop the skills and knowledge needed for this complex area. One Health is now globally recognised as a necessary and valuable approach to resolving highly complex health challenges.

Ministers of State and international agencies have endorsed this approach and governments are establishing joint committees between public health and veterinary authorities, with close links to wildlife and environmental agencies, with a view to developing inter-sectoral programmes. Our MSc provides training to fulfil this growing demand. It will continue to contribute to the track record of successful careers in government, research and other organisations where professionals are involved in the implementation and management of health programmes.

Programme Content

The course starts in September or October each year and has a modular structure:

Term One

Induction

A one-week study orientation at RVC and LSHTM, including computing and study skills, and with sessions at the London International Development Centre and Animal Health Veterinary Laboratory Agency. Participants are introduced to methods of group working, problem-based learning and working together on collaborative exercises.

Module 1: Foundations of One Health

Introducing a critical understanding of the trans-disciplinary nature of One Health as an approach to problem solving; examining contrasting approaches used to control human, domestic and wild animal health across sectors. The approach provides the tools for working across health sectors on environmental change, such as climate change, and on human behaviour and globalisation impacts on future threats. The course uses a systems approach to examine the ecology of disease. Case studies are used throughout.

Module 2: Introduction to Disease Agents for One Health

Providing a knowledge of the life cycles and characteristics of major infectious disease agents that have a strong environmental component and affect both animals and man; the principal intervention strategies used to combat these and analysis of factors contributing to the success or failure of systems of control and intervention, showing where a One Health approach is beneficial.

Module 3: Infectious Disease Emergence

Basic biology, epidemiology and pathogenesis of emerging diseases, with particular attention to food safety, agro-ecology, biodiversity, genetics and innovation in control under the One Health paradigm. It includes the application of risk analysis from human, animal and environmental perspectives and an introduction to available tools.

Module 4: Introduction to One Health Epidemiology

This module provides detail on surveillance and outbreak investigation using an integrated approach in human, animal, environmental and ecosystem health. It includes basic statistics and modelling.

Term Two

Module 5: One Health Economics

The application of economics to One Health, showing (where sufficient data and modelling expertise are available) the application of economic tools and principles, including: the quantification of the economic effects of One Health; use of economic methods to aid decisions at individual, local and national levels; economic evaluation of specific One Health procedures and control programmes. No prior knowledge of economics is required.

Module 6: One Health Skills

This module focuses on addressing complexity in disease ecology from biomedical, socio-ecological, behavioural, epidemiological and management perspectives, and application of change theory, systems analysis, syndemics and an ecosystem approach, taking into account values, morals and ethics. It provides a route to integrating science and policy, using modern communication, informatics and analytical tools. It also provides a basis for scenario and contingency planning for unexpected events and consequences, research design appropriate to One Health problems and use of interdisciplinary teams and social capital in disease control.

Module 7: Medical Anthropology and Public Health

This module provides an understanding of the social drivers of disease with a focus on medical anthropology and public health. It includes a demonstration of the analytical understanding of a range of concepts and principles and definitions used in medical and social anthropology. Participants evaluate the role of anthropological enquiry in One Health and public health arenas and will use this perspective to critically evaluate epidemiological, medical, veterinary and public health approaches.

Module 8: Choices

Students choose between four LSHTM modules:

- **Vector Biology and Vector-Parasite Interactions** focuses on population and epidemiological study. It demonstrates knowledge of key aspects of vector behaviour, vector ecology and vector parasite interactions and applies a range of practical entomological techniques and tools.
- **Environmental Epidemiology** covers key issues in environment and health, and methods for investigation of environmental health hazards, from climate change to water-related health risks, which includes a number of infectious diseases. Problems of measurement and estimations of exposure will be addressed and solutions discussed, including use of GIS, time series and cluster analysis.
- **Epidemiology and Control of Infectious Diseases** covers aspects of the compulsory Introduction to One Health Epidemiology module in more depth, providing an opportunity for exploring mathematical models of infection dynamics and sero-epidemiology. Outbreak investigation and surveillance will include a simulated outbreak which students investigate, analyse and write-up. Vaccinology is covered in detail mostly from the human perspective.
- **Globalisation and Health** covers key issues in global health, including: definitions and conceptual frameworks, forms of global change related to health, and theoretical and methodological challenges of measuring links between global change and health. Major issues in global health such as trans-border health risks, global health inequalities, changing determinants of health and aspects of global health governance will be described and discussed.

Term Three

Project

The final four months of the programme are spent working on an individual project, under the guidance of a supervisor. The project consists of a research proposal and literature review and a study, which can be either empirical, strategic or policy oriented. Participants sponsored by their employer often carry out a project related to their work.

Assessment

Assessment takes place during and at the end of each module and involves a variety of methods including written work, traditional exam questions, open book methods and in-course assignments such as problem-based learning presentation assessments. There is also a project report and an oral examination.

Entry Requirements

Applicants must have (or expect to receive) a first or second class university honours degree. We invite applications from candidates with a background in public health, veterinary sciences, biological sciences, social and environmental sciences and ecology and wildlife health.

English Requirements

Applicants whose first language is not English will be asked to provide evidence of proficiency in spoken and written English, including scientific usage and comprehension. They will be required to achieve an overall score of 7.0 in IELTS with a minimum of 6.5 in each sub-test; or a TOEFL score of at least 93 (internet-based test with no element below 23).

Course Duration

The full-time MSc is completed over one year full-time study and is delivered in a flexible, modular format, with assessment during and at the end of each module.

Applications

Applications to the programme will close on 31st August 2013.

To register your interest, please email graduateschool@rvc.ac.uk and we will get in touch with you as soon as possible.

Future Options

It is anticipated that shorter study courses e.g. certificates, diplomas or individual modules as well as part time study options will be available in future years.

Advance your career and apply...



Please visit www.rvc.ac.uk/postgraduate/courses/one-health

The Graduate School
The Royal Veterinary College
Royal College Street
London
NW1 0TU
Telephone: +44 (0)20 7468 5134
Email: graduateschool@rvc.ac.uk
www.rvc.ac.uk