

Veterinary Students as Global Citizens



Exploring opportunities for embedding the global dimension in the undergraduate veterinary curriculum

This report has been funded by UK aid from the UK Government, however the views expressed do not necessarily reflect the UK Government's official policies.

The views expressed in this report are the opinions of the authors based on the experience gained during the Students as Global Citizens project and do not necessarily reflect the views of their institutions or wider professions.

Veterinary Students as Global Citizens

Exploring opportunities for embedding the global dimension in the undergraduate veterinary curriculum

Authors

Jenny Maud

Project Officer, Students as Global Citizens
Royal Veterinary College

Nicole Blum

Lecturer in Development Education
Development Education Research Centre
Institute of Education

Nick Short

Head, E-Media Unit
Royal Veterinary College

Nigel Goode

Senior Lecturer in Comparative Biomedical Sciences
Royal Veterinary College

© Royal Veterinary College, University of London and Development Education Research Centre, Institute of Education, 2012.

Published by Royal Veterinary College and Development Education Research Centre, Institute of Education.

ISBN: 978-0-9574546-4-4

Contents



Foreword	3
Executive Summary	4
Introduction	5
What is the global dimension of veterinary medicine?	8
Why is it important to include the global dimension in veterinary education?	12
How can the global dimension be included in the veterinary curriculum?	16
What are the key challenges?	24
Conclusions	28
Further resources on global veterinary medicine and global awareness	29
References	30

Foreword

Veterinary surgeons are extremely well placed to positively influence the future health and welfare of all animals, including humans. Expansion of this role for the profession is becoming increasingly urgent as the human population expands and the earth's ecology appears to be veering towards a dangerous imbalance. These strains will inevitably increase as demands on limited resources grow, reflecting the affluence and aspirations of emerging economies.

Vets should play increasing roles in addressing the relevant associated questions, such as food security, efficient and sustainable production, control of animal diseases and zoonoses, conflict between conservation and livelihoods and harnessing benefits from biodiversity, to name a few. This 'Students as Global Citizens' project has looked at all of these questions in terms of the undergraduate veterinary medicine curriculum at the Royal Veterinary College and made some interventions to increase the students' understanding of these broad topics. This report describes some of these developments with a view to sharing experience and encouraging other veterinary schools to address these important issues.

Our initial efforts have had a clear development studies slant, and have set the ground work for broader interventions which will build upon existing teaching strengths, for example in epidemiology. The project has been well received by students, and future plans will aim to develop their inherent engagement with the complex topic of how societies use animals. Space has been made in our crowded curriculum to allow students to investigate these issues - we hope that a larger percentage of vet students will be enthused to go on to use their skills to tackle 'global' issues, and that all vet graduates will have a better understanding of their responsibilities as global citizens. Finally the students' responses to the interprofessional aspects of the study have been striking, and we aim to develop this interdisciplinary exposure in our plans.

We would like to thank Dr Doug Bourn, Professor Javier Guitan, Dr Wendy Harrison, Professor Richard Kock, Beverley Panto, Emily Slater, Professor Jeff Waage and Dr Barbara Weiland for their valuable assistance with the project and this publication.

Nigel Goode, Royal Veterinary College 2012



Executive Summary

Veterinary medicine has an increasingly important role to play in addressing the global challenges of the 21st century, particularly in working towards worldwide disease control and food security. This contribution will be vital in the face of pressures resulting from a rapidly expanding, increasingly mobile human population and climate change. Globalisation will, conversely, also see world affairs impacting upon veterinary practice in the United Kingdom as never before. Veterinary undergraduate education must reflect these challenges and equip tomorrow's veterinary surgeons with the knowledge and skills that they will require to practise in a rapidly changing world, and to contribute effectively to society's needs.

This report is based on the work of the Department for International Development (DFID) funded 'Students as Global Citizens' project, which has investigated methods of embedding global and international development issues in undergraduate medical, veterinary and pharmacy curricula. It explores the contributions that veterinary medicine can make to global health and development and highlights the need for improved undergraduate teaching in this area. The report outlines the potential benefits of learning about global and development issues both for graduates who plan to work

in global fields and those who plan to work in traditional practice. Using practical examples from the Students as Global Citizens project, it reflects on how this might be achieved and the barriers to change. These include limited space within undergraduate curricula, approaches to teaching and learning, perceptions of the relevance of global health to training and professional development, and the need for greater support from relevant professional bodies. Finally, it makes a number of recommendations for future work on these issues within UK veterinary education.



Introduction

The advances of the 21st century have led to a world that is extensively interconnected. People, information and resources move around the globe at unprecedented rates and with ever more complex interactions. Yet despite these advances today's globalised world also faces unprecedented challenges, not least the pressures on the environment, health and livelihoods brought about by rapid population expansion and climate change.

These factors have not gone unnoticed by the veterinary profession, which has recently begun to place increased importance upon its global role in animal, human and environmental health, and in sustainable development. In particular, the concept of 'One Health' has risen to prominence amongst the veterinary and wider community in the last decade. This principle recognises that human health is intrinsically linked to that of animals and of the environment, and that many of the answers to the pressing health and welfare problems of the 21st century can be found through interdisciplinary collaboration between professionals working in a wide variety of fields^{1,2}.

Alongside growing appreciation of the importance of 'One Health' there has been recognition of the need for improved veterinary education related to issues of global importance³. Various studies have been conducted into the likely workforce needs in veterinary medicine in the future, including the 2002 VET2020 European study⁴, the 2006 Association of Veterinary Medical Colleges (AAVMC) Foresight report⁵, and the 2012 United States National Academy of Science's "Workforce Needs in Veterinary Medicine"⁶. These reports concluded that in future there will be a greater requirement for vets working in non-traditional fields such as environmental health, food safety and security, public health research and epidemiology, and have led to calls for enhanced teaching

in these areas. Speaking at the 2012 British Veterinary Association Congress, newly appointed veterinary peer Professor Lord Trees commented that global challenges relating to food security, emerging diseases and climate change had "huge veterinary dimensions" and suggested that the veterinary profession could do more to help tackle them. In particular, he argued, there is a need to inspire the next generation of vets to ensure that there is "a cohort of the profession interested, inspired and involved enough in these big issues to claim our rightful place in dealing with them"⁷.

The veterinary profession is not alone in recognising the increasing importance of developing a global perspective, and the last decade has seen a significant move towards internationalisation amongst policymakers and many higher education institutions. A range of UK and international policy frameworks have led a growing number of universities to develop their internationalisation strategies. These include, for instance, responses to the Bologna Process, the current 'UN Decade for Education for Sustainable Development' (2005-14), the Leitch Review of Skills and initiatives organised by bodies such as the Higher Education Academy^{8,9,10}. These frameworks promote internationalisation, not only as a way of attracting international students and exporting expertise around the world, but also in recognition of the need to create "globally competent professionals"¹¹. Indeed, globalisation and internationalisation present a

number of challenges for higher education, and in particular a demand for the “creation of new world citizens with proper knowledge of, skills for, disposition applicable to, the globalised world”¹². Central to higher education responses to globalisation, therefore, is a need to identify and support learners in developing (i) the skills to make sense of what is happening around them, (ii) the ability to recognise diverse interpretations and viewpoints and perhaps

above all (iii) techniques to deal with diversity and complexity¹³.

Developing these skills requires the broadening of curricula and the inclusion of new approaches to teaching and learning. These might include, for example, the addition of new curriculum content and new opportunities for international study or work, as well as new teaching and learning strategies. In practice,



Global Veterinary Careers

Nick Lyons, PhD Student, London School of Hygiene and Tropical Medicine

I graduated from Cambridge University in 2005. After graduation I undertook an internship in large animal medicine at Dublin University, followed by a residency in dairy cattle health and production at the Royal Veterinary College. Following a period in private farm animal practice I returned to London to complete an MSc in Veterinary Epidemiology. I am currently undertaking a PhD at the London School of Hygiene and Tropical Medicine.

My current research is focused on international control of foot and mouth disease, looking at East Africa in particular. My work is looking at how to implement effective vaccination strategies to reduce disease impact both in commercial and smallholder dairy farms. The work is field based and also integrates economic impact into the approach. Through more effective vaccination, the impact of disease can be lessened with direct economic benefits to farmers. Long term, control at a national level may allow exports to disease free countries that should further increase revenues to farms. Knowledge transfer on epidemiological approaches to controlling this diseases may sustainably assist with control of other animal diseases.

Veterinary roles in future should be directed towards trans-boundary disease control of the significant zoonotic and economic diseases of livestock. Multinational collaborations of academic institutions, NGOs, clinical veterinarians and governments will evolve in response to the inevitable demand, alongside increased roles for international consultants.

Undergraduates should have a clearer understanding of global issues in animal health and be made aware of opportunities outside domestic clinical practice. This should include funds being available for dedicated students wishing to undertake research projects in developing countries.



this means not only incorporating particular themes (e.g. sustainable development, global forces and processes, the role of the student as a global citizen) within existing curricula, but also attending to the nature of the learning taking place.

More broadly, developing a global perspective on health within higher education may require higher education institutions to consider their core purpose. As Gough and Scott (2007) pose with reference to the role of higher education in sustainable development:

"If we are secure in our estimation of the worth of what we already know, and clear about what we want to happen next, then we can certainly decide what the next generation needs to know, and universities can teach it to them.

On the other hand, if we recognise and acknowledge our human failures, and are nervous about the future, then we need universities to prepare a generation that will understand, and act, better than any of us presently do"¹⁴

This raises significant questions for educators about how educational programmes should be organised so that they encourage learners not only to master particular areas of subject knowledge, but also to develop the skills of analysis and critique which they can use to understand and respond to the rapidly changing world around them.

This drive from higher education policymakers to equip all UK graduates with the skills they will need to contribute meaningfully to tomorrow's challenging global society dovetails with the drive within the veterinary profession to look beyond the traditional 'James Herriot' view of the veterinary surgeon. Alongside continuing to equip graduates with world-class single animal clinical skills, this additionally requires institutions to provide them with the ability to recognise and contribute towards the role of their profession on a global level. It also requires students to be educated to

recognise the ways in which global issues will impact on their practice, regardless of where they work in the future. Veterinary medicine, and the healthcare disciplines in general, are some of the higher education courses for which internationalisation is most relevant; the skills of these professionals are applicable throughout the world, and they have much to contribute to international development.

It was in this environment that in 2009 DFID funded a three-year project, 'Students as Global Citizens'^{15,16}. The initiative was a collaboration between the Institute of Education (IoE), the Royal Veterinary College (RVC), the Institute for Global Health at University College London (UCL), the UCL School of Pharmacy, and the London International Development Centre (LIDC). The research partnership aimed to develop and evaluate methods of integrating teaching on global and international development topics into the undergraduate curricula for veterinary medicine, medicine and pharmacy.

The report which follows is based on the experiences of the Students as Global Citizens project. It aims to stimulate further discussion on the inclusion of global topics and perspectives within the undergraduate veterinary curriculum. Whilst the report is especially relevant to veterinary educators, it will also be of interest to the wider veterinary profession, and to the higher education community in general. In addition it is intended that veterinary undergraduates will find this report thought provoking. We hope that student readers will be inspired to consider adding their own views to the debate on veterinary education in this area, and to consider how the global dimension will impact upon their future careers.

What is the global dimension of veterinary medicine?

What exactly does 'global' veterinary medicine involve? What should a global veterinary education therefore include?

The global dimension of veterinary medicine includes the vast array of its applications on a population or global scale, and conversely how population level and global issues can influence the local practice of veterinary medicine. It can also refer to the role of the veterinary profession in promoting human health and wellbeing. This includes the social, political, cultural, economic and environmental contexts that impact on animal and human health, explores how these factors interrelate, and suggests why they might be different in diverse parts of the world.

It is important to note that a global veterinary perspective is more than the traditional discipline of tropical veterinary medicine,

which focuses mainly on the less economically developed world. It recognises that the world is increasingly interconnected and that the local and the global are intrinsically related. Global veterinary medicine is as much about the impact of global factors on local veterinary practice as it is about veterinary practice overseas.

There is therefore a wide range of global topics relevant to veterinary professionals, including:

- Zoonotic, emerging and trans-boundary disease¹⁷
- Population medicine and epidemiology
- The role of veterinary science in livestock health and welfare¹⁸, promoting efficient food

Box 1: Student perspectives on global issues

As part of the work of the Students as Global Citizens project, second and third year veterinary students took part in focus group sessions. These sessions aimed to explore students' existing perspectives on global issues, their views on the relevance of global topics to their careers and their views on integrating global topics into the veterinary curriculum. A sample of responses to the question **"What do you think 'global and development issues' means in the context of veterinary medicine?"** are given below:

"Using veterinary knowledge to help with poverty reduction"

"A global community of vets around the world and how they can work together"

"Learning about the economics of farming and how vets affect the bigger picture"

"The veterinary course is geared towards individual animals, this means looking at things on a broader scale"

"Disease spread in other countries and how it might affect the UK"

production and poverty reduction

- Inequalities in global resources and how these might be addressed
- Global food security
- Food hygiene and safety¹⁹
- Ecology, ecosystems and their interactions with human and animal health²⁰
- Climate change
- Human population expansion and its consequences including urbanisation, livestock farming intensification and pressures on animal protein as a food source.
- The interaction of livestock farming with the environment
- Non communicable disease
- Antimicrobial and antiparasitic resistance²¹
- Global trade and its implications²²
- Politics and animal health legislation
- Veterinary roles in disaster and emergency relief
- Diverse cultural attitudes to animals and their welfare
- The differing roles of veterinary practitioners around the world

The role of interdisciplinary collaboration

The One Health concept has risen to prominence in recent years, as discussed earlier and in Richard Kock's case study overleaf. The concept is a broad one, and its exact meaning and significance are the matter of some debate. The underlying principles, however, mesh with the global perspectives discussed above.

One Health recognises that ecosystem, animal and human health are inextricably linked and seeks to apply a holistic approach to health. In particular the concept recognises that risks at the human-animal-environment interface must be controlled by considering all of the diverse factors that contribute to disease,

beyond the aetiological agent itself. One Health seeks to apply a cross disciplinary, 'whole society' approach to health, and as such emphasises the importance of interdisciplinary collaboration. The concept therefore promotes and facilitates the integration of disciplines such as ecological, biological, environmental, social, medical and veterinary sciences.

In recognition of the One Health concept, global veterinary education should therefore inform students of the importance of interdisciplinary collaboration and provide them with examples of the efficacy of this approach (see Box 2).

Global skills

Providing a global perspective within veterinary education not only involves ensuring that students have a basic understanding of the factual information behind these global issues, but also supports them in acquiring the skills to apply this knowledge effectively. Educational research suggests these might include:

- An ability to understand perspectives and cultural values which are different from one's own
- Communication skills and the ability to work in an interdisciplinary team
- An ability to critically analyse problems involving a complex range of social and ethical concerns
- An ability to be flexible, adaptable and to prioritise in resource poor situations²³

Many of these skills are applicable to practise in any veterinary discipline, but the global dimension provides a particularly clear example of their importance.

Global Veterinary Careers

Richard Kock, Professor of Wildlife Health and Emerging Diseases, Royal Veterinary College

I have spent my career working as a wildlife veterinarian, researcher and conservationist. From 1983-2010 I was attached to the Zoological Society of London, working in zoological medicine from 1983-90, and then seconded to the Kenya Wildlife Service in Nairobi from 1991-98 where I worked to start a new veterinary unit. Alongside starting this unit, which now involves 72 permanent staff, I provided support to conservation initiatives in the region, and worked to build networks and veterinary capacity. From 1999-2005 I was seconded to the African Union Inter African Bureau for Animal Resources, working on Rinderpest and other transboundary diseases in wildlife and livestock. This work included diagnosis



and control of the last outbreak of Rinderpest globally. I returned to the UK in 2006 and worked on regional conservation projects in deserts and rangelands with a wildlife health perspective, including in Nepal, India, East Africa and Central Asia. In 2011 I took up my current post at the RVC, where I am working on infectious disease at the interface between humans, animals and the environment, for example Saiga antelope disease in Kazakhstan, ecohealth in Tanzanian Masai communities and village chickens and their disease ecology across Africa.

I have an interest in One Health teaching from a wildlife and ecosystems perspective, and am involved with development of novel One Health training modules and courses, including the development of a new One Health MSc course between the RVC and the London School of Hygiene and Tropical Medicine. One Health recognises that the health of humans, animals and ecosystems is intimately connected and involves a coordinated, collaborative, multidisciplinary and cross-sectoral approach to addressing a wide range of potential or existing risks at the animal-human-ecosystem interface. The One Health movement strives to develop new methods



to assess human and animal health, their respective social and environmental determinants and to assess the value of improved cooperation and collaboration of human and animal health disciplines. One Health learning is a participatory and highly reflective process involving a wide variety of ideas and skill sets across multiple disciplines. It involves students gaining an understanding of trans-disciplinary methods of engagement, study and research, of socio-economics and of the fundamentals of disease from a systems perspective. It

is a comprehensive methodology that includes all disciplines relevant to establishing disease ecology and epidemiology and its prevention or control. This involves moving beyond the primary aetiological agent to include co-factors and drivers e.g. behaviours, genetics and even ecological immunity. More broadly, One Health education involves students in an appreciation of the importance of shifting from a narrow fortress mentality towards infection and disease - using only biomedical and restrictive measures - to a more holistic ecological health approach, focused on avoidance and prevention through change in systems and behaviours.

Box 2: Severe Acute Respiratory Syndrome (SARS); an example of global veterinary medicine in action

The 2002-03 outbreak of SARS involved 8000 human clinical cases in 37 countries, including 4 in the UK, and over 900 deaths²⁴. Our understanding of the aetiology and epidemiology of the SARS outbreak provides a good example of the network of complex interactions involved in global disease in the 21st century.

The origins of the SARS virus have been traced back to the Guangdong region of Southern China. SARS-like coronaviruses²⁵ with phylogenetic links to the human SARS virus have been isolated from wild fruit bats²⁶. Other similar viruses have been isolated from palm civets²⁷ in marketplaces in the region. It has been hypothesised, but not yet proven, that bats might have been the initial reservoir for the virus, which then spilled over, via a series of intermediate hosts, to the civets and humans. At each host step the virus will have undergone a series of mutations until this evolutionary process finally allowed it to persist and amplify in humans.



The crucial factors in this process are the human social conditions that allowed viral evolution and transmission to occur. An economic boom in China drove demand for the unusual delicacy of civet meat. A rise in intensive methods of farming led to farmed animals being kept in close proximity and under stress, ideal circumstances for virus spread. Social urbanisation in China meant that there were large numbers of people living in close proximity to the animal markets, in ideal conditions for zoonotic transmission. Once established in humans, SARS was then able to spread to so many countries so quickly due to the volume of air travel occurring in the 21st century (there were 5.2 trillion passenger kilometres flown in 2011)²⁸.

The response to the SARS outbreak illustrates some of the benefits of interdisciplinary collaboration. Scientists from different disciplines in organisations such as the World Health Organisation (WHO), the Food and Agriculture Organisation of the UN (FAO) and the OIE worked together with the Chinese authorities to investigate the outbreak²⁹. Without such collaborations the disease might have been less effectively controlled, or its source less readily identified.

Why is it important to include the global dimension in veterinary education?

What does a globally educated veterinary student have to offer the world?
What does a global education offer to the veterinary student?

What does a globally educated veterinary student have to offer the world?

It is no exaggeration to say that future challenges to global animal and human health and welfare are unprecedented. The world's human population is projected to reach 9 billion by 2050, an increase of almost 50% from the year 2000³⁰. This population expansion, combined with an increase in prosperity in the developing world, is predicted to dramatically increase demand for food products of animal origin. In what has been referred to by the Food and Agriculture Organisation of the United Nations (FAO) as the 'Livestock Revolution'³¹, demand for meat is predicted to rise from 229 million tonnes in 2001 to 465 million tonnes in 2050³².

While population growth increases demand for meat, climate change is predicted to impact heavily on the availability of space, food and water available for keeping livestock. This will particularly affect the 600 million of the world's poor who rely directly on smallholder farming for their livelihoods³³. The increased demand for food from animals, together with increased urbanisation, is likely to lead to farming intensification. Such intensification places increased pressures on the environment and also on animal health and welfare³⁴.

The effects of climate change, together with the recent dramatic increase in human and animal movement around the world, also mean that infectious diseases previously confined to the tropics now have global effects. Infectious diseases in animals not only have vast impacts on livestock production, but also on human

health, with approximately 70% of emerging and re-emerging human diseases being zoonotic³⁵. As human population size and movements increase, and humans and animals are forced into closer proximity, threats from pandemic zoonotic diseases, such as avian influenza, are predicted to increase.

Veterinary surgeons' unique cross-species understanding of disease, combined with their broad education in animal production systems and population medicine, makes them ideally placed to tackle this vast array of problems. A global veterinary education is therefore important in inspiring students to pursue careers which will make positive contributions to society.

What does a global education offer the individual veterinary student?

While one goal of a global veterinary education is to inspire veterinary students to enter global health fields in their careers, it is likely that the majority of veterinary graduates will continue to work in traditional clinical practice roles in the UK. It could be argued that a global education is not relevant to these students. Global awareness is currently not part of the Royal College of Veterinary Surgeons' (RCVS) essential competences required of the new veterinary graduate³⁶. However, given the global nature of future health challenges, and the skills and knowledge that are needed to address them, it is a crucial realisation that an understanding of global issues is relevant to **all** veterinary students, whatever field they choose to practise in.

Global issues have local impacts

The global dimension of veterinary medicine is not restricted to international settings. Veterinary surgeons working in the UK are now as likely to encounter 'global' issues in their practice as their counterparts working overseas. The most obvious example of this are diseases such as Bluetongue and Equine Infectious Anaemia, previously thought of as tropical diseases, but recently found in the UK. As discussed above, climate change and population movements mean that the frequency of UK outbreaks of diseases such as these is likely to increase in future.

Global economic and political factors also impact on UK veterinary practice. For example, the worldwide financial crisis has affected

all veterinary businesses. European animal health legislation, global trade and fluctuating food prices heavily impact UK farming. Due to increased migration the UK population is increasingly diverse, and veterinary students will encounter clients and colleagues from around the world with different perspectives on health, medicines and animal welfare. The development of a wider cultural awareness through a global veterinary education is therefore an important part of communication skills training for future professionals³⁷.

Wider skills applicable to all fields of veterinary medicine

Many of the skills acquired through global veterinary education, as described in the previous section, such as the ability to work

Box 3: RCVS Day One Competencies with relevance to global veterinary medicine³⁶

A1- General Professional Skills and Attributes

A1.1 **Communicate effectively with clients**, the lay public, professional colleagues and responsible authorities; listen effectively and respond sympathetically to clients and others, using language in a form appropriate to the audience and the context.

A1.3 **Work effectively in a multi-disciplinary team** in the delivery of services to clients.

A1.4 Be aware of the **ethical responsibilities** of the veterinary surgeon in relation to individual patient care and client relations, and also more generally in the community in relation to their possible **impact on the environment and society as a whole**.

A1.6 Be willing to use one's professional capabilities to contribute as far as possible to the advancement of veterinary knowledge in order to benefit veterinary practice and **further improve the quality of animal care and public health**.

A1.10 Be able to **cope with uncertainty** and **adapt to change**.

B1 Underpinning Knowledge and Understanding

B1.1 The sciences on which the activities of veterinary surgeons are based.

B1.2 Research methods and the contribution of basic and applied research to all aspects of veterinary science.

B1.8 The principles of disease prevention and promotion of health and welfare.

B1.9 **Veterinary public health** issues including **zoonoses**.

in a multidisciplinary team, to 'think outside the box' and to understand other cultural viewpoints are very important skills for any area of work. These skills **are** currently included in the RCVS 'Day One Skills' (Box 3). Many of these learning outcomes, which are already taught in other areas of the veterinary degree course, are particularly well addressed through attention to global contexts and concerns.

Advocates for the profession

Whatever their chosen career, qualified vets must act as diplomats for their profession. Even a veterinary surgeon working in small animal practice can expect to be asked questions relating to topical global health issues by their clients. A global veterinary education allows students to become more effective advocates for the role of the veterinary profession in global health, even if they do not work in such fields themselves.

Students recognise the importance of global perspectives

The final, but by no means least important, justification for the inclusion of the global dimension in veterinary education comes from the students themselves. Veterinary students are typically forward thinking, are interested in global affairs and have demonstrated a clear interest in global veterinary education. 100 first year veterinary students were surveyed by verbal questioning and electronic voting at the end of a lecture given as part of the Students as Global Citizens project. 87% either strongly agreed or agreed that veterinary education should prepare professionals to work overseas, and 74% said that they would like to work overseas at some point in their careers. Similarly, 75% of 90 final year veterinary students surveyed electronically during a lecture unrelated to global topics agreed that global and development issues should be taught as an **important** part of the undergraduate curriculum.

Box 4: Example second year veterinary student responses when asked during a focus group session: “Do you think it’s important to learn about global and development issues as part of the undergraduate veterinary medicine course?”

“The world is becoming a smaller place and there’s a lot more global trade. Vets need to be aware of diseases that may come into this country, or if they want to go out and help in the world it’s important to know what’s going on”

“It makes a change from anatomy and physiology!”

“I would like to work in developing countries when I qualify”

“ [Students coming straight from school] don’t necessarily have experience of different cultures and how things are done overseas and I think that it’s a very important thing that they should be made aware of”

“If a client starts talking to you about something in the news and you don’t know about it you will look like a pretty rubbish vet. You need to know about what’s going on in the world”

“The world is getting smaller and it is going to be more important to know about these issues in the future”

Global Veterinary Careers

David Hadrill, International Veterinary Consultant

I graduated from Bristol Veterinary School, and subsequently studied at the University of Edinburgh, gaining an MSc in Tropical Veterinary Medicine. I currently work as an Independent Veterinary Consultant, based in the UK. I worked with pioneering community-based animal healthcare (CBAH) projects in India and Kenya in the 1980's and have since undertaken long-term contracts in:



- *India (CBAH),*
- *The Caribbean (responsible for an island's veterinary services and control of the tick, *Amblyomma variegatum*, associated with dermatophilosis in cattle and other species),*
- *Mongolia (team leader of EU project to strengthen national veterinary services) and*
- *The Horn of Africa (support to marketing livestock from pastoralist areas of Ethiopia, Djibouti and Somalia following import bans associated with Rift Valley Fever).*

I have also undertaken many shorter assignments for NGOs, the UN Food and Agriculture Organisation (FAO), EU, World Bank and Asian Development Bank. This work includes project evaluation and management, control of transboundary animal diseases, participatory training and disaster relief.

I have been involved in authoring several publications including 'Horse Healthcare: A Guide for Animal Healthworkers and Owners' and the 'Livestock Emergency Guidelines and Standards (LEGS)' handbook. I am now one of the core team of LEGS trainers who are rolling out a programme of training-of-LEGS-trainers worldwide: I have co-led training courses in Cambodia, Senegal, South Africa and Ethiopia and will do one for French north African countries in Tunisia in December 2012.

Disaster relief work included helping NGOs and the FAO assist Mongolian herders to sustain their livelihoods in severe winter crises associated with huge die-offs of the herds that provide their food, income and employment. The crisis response comprised targeted feed provision and support to veterinary services.

I think that in future there will be a need for vets to:

- *take lead roles in global/regional control of transboundary animal diseases,*
- *lead the debate about international commodity-based trade and its certification for animal products including meat,*
- *be closely involved with changes reflecting a greater awareness of animal welfare in other countries,*
- *support community-based animal health care where local veterinary services do not meet needs.*

How can the global dimension be included in the veterinary curriculum?

This section will examine how global themes are currently included in the undergraduate curriculum, and how they might be better addressed in future. It is beyond the scope of this publication to examine veterinary curricula worldwide, or indeed within all UK veterinary schools. Instead, the work of the Students as Global Citizens project at the RVC, and the curriculum at the RVC in general, is used as an example.

How is the global dimension currently included in the curriculum?

Prior to the start of the Students as Global Citizens project, undergraduates at the RVC were primarily exposed to global topics through the extensive 'Population Medicine and Veterinary Public Health' strand which runs through years 1-4 of the BVetMed course. Teaching in this strand includes topics such as zoonotic disease, food safety, risk analysis, population medicine and an introduction to epidemiological principles. The veterinary public health course, however, must necessarily dedicate much of its teaching to core science topics, in order to satisfy compulsory requirements for teaching in these areas.

Students additionally received one lecture on global health in the first year, and had

access to global topics through activities such as one-off optional lectures, involvement in extra-curricular societies and self organised overseas placements. A final year elective in International Animal Health (See Box 5) is also available. Due to the optional nature of these activities, however, only students with a pre-existing interest in global and development issues were likely to pursue them.

Although the focus of the project was on the undergraduate course, for interested students a range of postgraduate opportunities also exists to pursue global and development topics. A number of taught MSc courses in One Health, veterinary epidemiology, public health and associated disciplines are available in the UK and overseas, and the number of these courses has been increasing in recent years. Opportunities for further training through research also exist at MSc and PhD level.

Box 5: International Animal Health Elective

An International Animal Health elective is one of the available options for 5th year veterinary students at the RVC. The elective is a week long intensive course and involves MSc and PhD students alongside undergraduates. Activities include lectures on topics including wildlife health, zoonotic disease, the control of epidemics and the roles of bodies such as the Food and Agriculture Organisation of the United Nations, the World Organisation for Animal Health (OIE) and the World Health Organisation. Guest lecturers with international experience are invited, such as Peter Roeder, who was secretary of the Global Rinderpest Eradication Programme from 2000-07. Students are also involved in preparing poster presentations on international animal health topics. The week ends with a visit to the Department for the Environment, Food and Rural Affairs (DEFRA) in London and the EU headquarters in Brussels.

Box 6: Visits to Overseas Universities

As part of the Students as Global Citizens project, Beverley Panto, a recent RVC graduate, travelled to Kenya and Tanzania in November 2010. The purpose of her trip was to explore perspectives on global issues and veterinary practice in East Africa and to gather materials for use in teaching at the RVC. Beverley spent time at veterinary schools in both countries and visited a number of veterinary projects run by Vetaid Kenya, a non governmental organisation.



The following year, Kimberley Schiller, another recent RVC graduate, travelled to Chittagong Veterinary and Animal Sciences University in Bangladesh. She had the opportunity to experience how veterinary students are taught by attending lectures and practical sessions and by shadowing students on their clinical rotations. She also visited several new initiatives being run by the university outside of Chittagong, including community-based and satellite clinics.

Both Beverley and Kimberley collected hundreds of hours of video footage using a simple flip camera and laptop. This included video interviews with students, academics, members of the community and vets in the field. These videos were then made into teaching resources for use as part of the directed learning sessions in the professional studies strand. They also wrote a blog of their experiences. The Veterinary Times covered this story in a number of articles that helped promote the value of global perspectives within veterinary education³⁸.

What has the Students as Global Citizens project involved?

The scope of global veterinary topics, as already discussed, is vast. There is not sufficient space in the undergraduate curriculum as it is currently organised to cover all of these topics in depth, and given that the majority of veterinary students will not go on to work in global fields in their careers, such very detailed teaching might not be appropriate for all students.

In recognition of the demanding nature of the undergraduate veterinary curriculum, the project therefore sought to integrate global issues within existing sessions and to complement what was already being taught. With many of the underlying scientific

principles already included in the veterinary public health course, the project has particularly aimed to 'set the scene', opening students' eyes to wider global issues, so that they can see how what they are taught in a number of other courses can be viewed through the lens of global health. Activities particularly focused on exploring veterinary roles in international development, developing cultural and socio-economic awareness and encouraging interdisciplinary collaboration (see Box 8). They were designed to reach all students, rather than just those with a pre-existing interest in global issues.

The project also aimed to employ teaching methods that encourage development of the 'global skills' identified earlier. This is because the complex nature of globalisation

necessitates a new paradigm for learning, including the need for skills to recognise different perspectives, to work in a more flexible manner and with diverse groups of people³⁹. Therefore, rather than focusing on traditional methods such as lecturing, exploration of global concerns is better suited to student centred approaches to teaching and learning. These include workshops, seminars and the use of case studies, as well as assessment involving short answers or essays instead of multiple choice questions. Communication skills, for instance, can be effectively developed through the use of teamwork and discussion exercises, and critical thinking and problem solving skills can be encouraged through analysis of case studies or outbreak scenarios.

What new opportunities for learning were developed?

The Students as Global Citizens project introduced the following additional opportunities for RVC students:

Years one and two:

Two lectures were introduced into the

professional studies strand. The first, 'Vets as Global Citizens' introduces students to their global roles and responsibilities. Recent graduates who have overseas experience gave sections of the lecture. The second, a lecture on 'One Health', was given by Dr Wendy Harrison from Imperial College, London, a vet working in tropical medicine, focusing on zoonotic and human disease.

In the second year, an option was introduced to the 'Integrated Concepts' session providing students with an opportunity to conduct research into a development related topic. This task involved a group of students working together to prepare a presentation on a global health topic, for instance global issues surrounding livestock as a food source.

Year three:

Students were engaged in two half-day scenario-based small group tasks. In the first students were presented with video footage recorded by recent RVC graduates who had visited East Africa and Bangladesh as part of the project (See Box 6). These case studies were used as the basis for discussions on issues such as ethics, animal welfare, the role

Box 7: Student Research Team

The RVC Student Research Team⁴⁰ involves a group of 8-10 students organising an expedition to a developing country in order to carry out research with the goal of "understanding the prevalence and effect of animal disease in order to improve the ability of farmers to support their families and communities through healthier stock".



The team members are required to fundraise to support their trip, and to present their findings on their return. The tradition began 50 years ago, and continues biannually to this day. In 2011 a team visited Indonesia in order to investigate sustainable aquaculture, and the 2013 team plans to visit Madagascar in order to investigate Swine Fever. For the first time the 2013 team will travel with two medical students who will investigate human socio-economic impacts of disease. Previous members of the student research teams have been inspired by their experiences and gone on to careers in global research fields.

of women in professions and the challenges of working as a veterinary professional in developing countries. The second session involved a simulation of endemic disease control in a developing country, allowing students to consider the vast array of factors, including socio-economic and wildlife vectors, impacting on outbreak management.

Third year students were also given the opportunity to attend evening sessions on overseas extra-mural studies (see below).

Year five:

Information was provided on career opportunities in global and development fields as part of the Professional Studies strand and in a careers evening.

In addition to these interventions at the RVC, the Students as Global Citizens project partners worked together to pilot a number of interdisciplinary learning sessions, see Box 8.

Overseas Extra Mural Studies

The importance of overseas experience has been recognised by a number of universities worldwide which have established schemes to enable improved student access to overseas placements⁴¹. One study commented that “veterinarians with international experience are better professionals because they are more resourceful and resilient, have expanded horizons and a wider professional perspective”⁴².

An additional focus of the Students as Global Citizens project has therefore been to encourage more students to undertake extra mural studies (EMS) overseas, particularly in developing countries. Allowing students to see veterinary practice overseas ‘first hand’ is a potentially powerful way of educating and enthusing them about global issues. Such experience can provide valuable practical training beyond what is available in the UK, and greatly improve students’ resourcefulness, communication skills and cultural awareness.

Organising overseas EMS, however, requires considerable time and money, which are often in short supply for students.

In response to this perceived opportunity the project introduced:

- An annual overseas EMS evening, providing practical information on how to organise overseas EMS, and talks from students and recent graduates who had travelled overseas previously.
- An extensive online overseas EMS guidebook. This was made available to all UK veterinary students through the project website⁴³, and was promoted in the British Veterinary Association’s support material for EMS.
- An online bank of reports from RVC students who had previously travelled overseas, to inspire and guide future students.

The activities of an existing RVC initiative, the Student Research Team (Box 7) has synergised neatly with this area of the project. The project’s inter-professional theme has been reflected in the current team’s decision to include medical students on their 2013 expedition.

What other opportunities are there to promote global awareness?

The Students as Global Citizens initiative has explored a range of ways of including global topics in the undergraduate curriculum, yet its list of curriculum interventions is by no means exhaustive. Based on the experiences of the project, and reports of similar initiatives at other institutions^{44,45} further suggestions for embedding global awareness within the curriculum might include:

Further inter-professional collaboration

The interdisciplinary learning session discussed in Box 8 was a particularly successful element of the Students as Global Citizens project. This positive reception is echoed by work carried out at other institutions. A recent study at Colorado State University College of Veterinary Medicine reported that

Box 8: Interdisciplinary Learning for Health Professionals

As discussed previously, and exemplified by the One Health concept, interdisciplinary collaboration is an important tool in addressing global health challenges

As part of its work, the Students as Global Citizens project organised two interdisciplinary workshops on Avian Influenza for students from UCL Medical School, the Royal Veterinary College and UCL School of Pharmacy. The aim of the sessions was to provide students with the opportunity to (i) have an increased appreciation of the complex nature of global health concerns, and particularly zoonotic disease outbreaks, and (ii) develop an understanding of the need for collaboration between health professionals and between actors and organisations at local, national, regional and international levels.

Participants were presented with the details of an outbreak scenario in Southern Sudan and then divided into interdisciplinary groups representing key national and international interests that respond to pandemic outbreaks: local health professionals, officials from the Ministry of Health and Ministry of Animal Resources in Sudan, representatives from international health organisations (e.g. WHO, Food and Agriculture Organisation, World Organisation for Animal Health), multinational pharmaceutical industry representatives, and local and international media organisations. Within each group, the players were instructed to discuss the response they would make to the scenario and the questions this raised in terms of both human and animal health. At various points in the workshop, the groups were also asked to negotiate about their planned activities with other relevant groups. Opportunities were also provided for whole group discussion and debate.



These interdisciplinary workshops were seen as a particularly successful part of the Students as Global Citizens project. Student feedback was overwhelmingly positive, with students recognising the importance of working across health professions and also seeing the value in a multi-levelled approach to complex global health concerns:

It is important, especially for medical students, to leave our insular 'bubble' once in a while and see the wider political, professional and international aspects of medical issues. UCL student.

It is important for people from different disciplines to come together to work on issues as each has different knowledge experiences and can contribute from different perspectives. SOP student.

It is important to realise how global issues regarding animals and humans are dealt with on a large scale (not just at the 'farm level'). RVC student.

74% of veterinary students surveyed said that they were “very interested” in lectures or courses taught by an interdisciplinary team of health professionals⁴⁶. Increased interdisciplinary teaching for veterinary students might include lectures from academics in other disciplines and cross-disciplinary student workshops or research projects. Such interventions have the potential to invigorate teaching and learning about global issues as well as to encourage inter-professional collaboration more generally^{47,48}.

Students take the lead

There is also potential for increased student-led activity in this area, for example through the establishment of extra-curricular student societies. The International Veterinary Students Association (IVSA) is an existing society which might be inspired to further explore global and development education. In addition, the medical student charity Medsin⁴⁹ is active in global health and has expressed an interest in including veterinary students amongst its membership. A fledgling ‘Development Society’ at the RVC was set up several years ago, however interest waned upon graduation of its core membership. Such initiatives should be encouraged, but may require the backing of academic staff to ensure their longevity.

Partnerships with overseas universities

Based on project’s initial positive experiences with student linkages in Nairobi, it may be possible for UK universities to develop partnerships with veterinary institutions overseas, particularly in the developing world. This might allow students to share experiences - either virtually, or through student exchanges. It would also allow co-operation between academics at both universities in teaching and research fields, to mutual benefit.

Making the most of recent graduates and postgraduate students

Recent graduates working in global or development fields, and postgraduate

students undertaking overseas research, are an important and underutilised teaching resource for undergraduates. Students see such graduates as approachable role models and recent graduates are often more able to give up their time for teaching purposes than senior academics. Peer tutoring and support schemes, for instance, could be created to encourage these interactions.

Outcomes of the Students as Global Citizens project

The positive reception given by both staff and students to the interventions of the Students as Global Citizens project have led to further improvements in global teaching and learning at the RVC. The project partners propose to further integrate the work of the project with the undergraduate curriculum, and particularly within the Population Medicine Veterinary Public Health course. As part of this, an additional six introductory lectures or interactive sessions are proposed for the first year of the BVetMed curriculum. These sessions will be provided by pre-eminent academics working in global health fields, and will aim to ‘set the scene’ for teaching later in the course. Additional interventions introduced by the Students as Global Citizens project, such as the directed learning sessions in the third year, and the overseas EMS evening, have now become permanent fixtures in the curriculum.

Alongside these developments, the project team at the RVC has proposed a set of learning outcomes for global veterinary medicine (Box 9). This echoes a similar list of learning outcomes developed by the medical profession and published in the Lancet⁵⁰. The Students as Global Citizens project partners at the UCL Medical School have adopted these learning outcomes and used them to embed global health issues throughout their undergraduate curriculum⁵¹ and the RVC is exploring the possibility of doing something similar.

Box 9: Proposed global veterinary medicine learning outcomes

The study of global veterinary medicine involves a wide variety of ideas and skills across multiple disciplines. For **undergraduate** veterinary students the outcomes include a **basic understanding of:**

1) Global trends in the 21st century

- Future global trends that will impact the veterinary profession including climate change and human population expansion.

2) Global disease: zoonotic, trans-boundary and pandemic

- Communicable and non-communicable diseases from a population or systems perspective, including epidemiological principles.
- Zoonotic disease and its impact on global human health.
- The nature and control of global epidemic disease.
- Global disease impacts on the UK.

3) Global agriculture and food security

- The importance of livestock to livelihoods and food security.
- The nature and impacts of global trade in livestock and products of animal origin.
- The role of the veterinary profession in ensuring efficient livestock farming; how this contributes towards global food security and interacts with the environment.
- The animal welfare implications of global livestock farming.

4) Socioeconomic and environmental determinants of disease

- The causes of disease beyond the primary aetiological agent, to include social, political, economic, genetic and ecological factors.
- The inter-relationships between environmental, animal and human health.

5) Interdisciplinary collaboration

- The importance and application of interdisciplinary methods of study and research.

6) Governance and politics

- The role of organisations such as the FAO, OIE and WHO in overseeing global health.
- The impact of politics and legislation on global disease control and food security.

7) Cultural diversity

- The influence of cultural background on human behaviour, and the implications this might have for animal health and welfare.
- The differing roles and attitudes towards animals and veterinary surgeons around the world.

In addition, global veterinary education involves students developing skills including:

8) Global skills

- The ability to think broadly and critically analyse complex and inter-relating socio-economic factors in relation to health and disease.
- The ability to understand perspectives different from one's own.
- The ability to communicate effectively with clients and colleagues from a diverse range of backgrounds.
- The ability to work effectively as part of an interdisciplinary team.
- The ability to be adaptable and respond positively to change.

Global Veterinary Careers

Holly Hufnagel, Consultant, Emergency and Rehabilitation Unit, Food and Agriculture Organisation (FAO) of the United Nations.

I graduated from Cambridge Vet School in 2011. During my studies I intercalated in Geography and in my 4th year I undertook a two-month internship with Save the Children USA's Pastoralists Livelihoods Unit in Ethiopia. After graduating I started an internship with the Food and Agriculture Organisation (FAO) of the United Nations that has led to working for them as a consultant.

I currently work in the Emergency and Rehabilitation Unit on the East Africa Desk. We implement disaster risk reduction and emergency projects with a strong focus on pastoralism. I've worked on a portfolio of projects in Kenya, Djibouti and Burundi. We aim to promote food security through increased agricultural production. I have undertaken an evaluation of the Djiboutian national veterinary services in order to assess which areas needed capacity building. We are also tackling public health issues by undertaking a national disease surveillance campaign for diseases such as Brucellosis, Foot and Mouth Disease and Pestes de Petits Ruminants. In addition, we are going to implement an awareness campaign to decrease zoonotic disease transmission.

For me, food security is the basis for the development of a country. This goes hand in hand with increased agriculture and safe food production. As livestock play an important role for many countries (and for pastoralist areas are the main source of income and nutrition) vets will be crucial for development in these countries. I therefore can only see a growing role for vets in international development. With growing export fluxes boosting economies of developing countries (for example millions of livestock from sub Saharan Africa to the Middle East), control of major zoonoses is becoming ever more important. I believe, however, that the link between human and animal health needs to be taken into greater consideration for human health initiatives. This is one area where vets, doctors and policy makers will need to work ever closer in the future, in particular with regards to emerging diseases.

With regards to undergraduate veterinary education, firstly, I feel that a lot of international development issues could be linked into the veterinary public health course. The link between development, human food security, animal production and animal health needs to be clear to students. Secondly, the work of organizations such as the FAO, World Health Organisation (WHO), DFID and charities such as Veterinaires Sans Frontieres (VSF) should be presented so that students can consider them as a viable career path. Finally, more opportunities should be created for EMS overseas, and additional funding made available. I benefitted from an EMS grant from the BVA overseas group, but there are not many funds available.



What are the key challenges?

While there are clearly strong arguments for improved teaching of global veterinary medicine and some readily identifiable ways of achieving such improvements, there is also a range of challenges to this process. This section explores some of the challenges encountered by the Students as Global Citizens project and how they might be addressed. It also briefly examines some of the wider factors which limit changes in this field.

Overcrowded undergraduate curriculum

One of the strengths of veterinary education is the broad scientific background it provides its graduates, combined with clinical knowledge and skills across a wide range of species. However, as veterinary knowledge and expertise advance, space in the curriculum is at an ever-greater premium⁵². There is considerable reluctance from staff and students to include any new content, particularly if it is not seen as 'core', as can be the case with global topics.

One method of approaching this challenge, as utilised by the Students as Global Citizens project, is to attempt to embed global topics within existing taught sessions, rather than attempting to include a large block of new teaching. As teaching staff see the value of subjects being taught, the amount of provision may increase, as has been the case at the RVC.

Perception of global topics

As a result of the heavy demands of the veterinary curriculum, veterinary students tend to be very strategic in their learning. The pressures of examinations mean that students also tend to do much of their learning by 'rote' and concentrate their assimilation of facts based on what is likely to be tested in exams or what they view as most useful for their careers. Many veterinary students are focused on particular career goals, which are often in clinical practice. Since global topics are not currently part of the core curriculum,

students are likely to perceive global learning as less important than either clinical topics, or those that they expect to be examined upon. However, efforts can be made on an institution wide basis to emphasise the importance of global topics, and the international involvement of the institution, thus promoting an institution wide 'culture' which encourages engagement with global concerns.

The perception of global topics as 'optional' can also be countered by making some elements of global teaching examinable, or by ensuring participation through compulsory essays or presentation preparation. Veterinary students tend to have a strong moral compass, and will often appreciate teaching in these areas if they are made aware of *why* they are learning, using the justifications discussed in earlier sections of this report.

Sessions should also be made as appealing and inspiring as possible. Focus groups conducted with second and third year veterinary students at the RVC have shown that students particularly appreciate opportunities to learn from academics from other disciplines, from vets with 'real-life' field experience, and to have the ability to travel abroad to see things for themselves. Observations made during the Students as Global Citizens project suggest that students tend to become more strategic in their learning as they proceed through the course, and are often more open to new ideas and perspectives in the early years of the programme. For this reason, many of the sessions in the Students as Global Citizens

project were delivered in the first year and subsequently reinforced with learning activities such as workshops and directed learning sessions in later years.

Approaches to teaching and learning

Traditionally veterinary schools have placed an emphasis on lecture-based teaching. By contrast, many of the 'global skills' identified in earlier sections are best explored through group working, critical reflection, simulation exercises or active discussion of complex

issues. These progressive, active, teaching methods can be difficult to implement, for instance due to the restrictions of large class sizes. In addition, academic staff might not be experienced in providing teaching in this way.

The benefits of teaching through such progressive methodologies apply across all fields of veterinary medicine, not only those with global associations. It is therefore important for teaching staff to receive support in how to implement such methods, for instance through professional development



Global Veterinary Careers

Beverley Panto, small animal veterinary surgeon

I graduated from the Royal Veterinary College in 2009. I have always been a keen traveller, and I combined this with my studies by carrying out a research project with orangutans in Borneo and doing EMS at a charity clinic in Thailand. After graduating, I was involved with the RVC's Students as Global Citizens project, and as part of this I travelled to East Africa, spending time at Nairobi and Sokoine Veterinary Schools, and working in the field with vets and community animal health workers. In my first year in practice, I volunteered with charity clinics in Thailand and Nepal. Both experiences hugely developed my surgical competence and confidence and exposed me to numerous exotic diseases and clinical cases that I would be unlikely to see in UK practice. I am currently studying for the RCVS certificate in zoological medicine and have plans to do further work overseas to help me achieve this.

Although I'm not currently working in international fields my involvement with overseas projects at university has definitely been invaluable to all aspects of my career. Working in developing countries gives a true insight into different cultures and communities that I feel you miss out on as a tourist. This overseas experience has been a huge factor in my personal development, as well as providing me with a new perspective on the role of the veterinary profession worldwide. I learnt to be extremely resourceful and innovative, and at times it certainly forced me out of my comfort zones and required a great deal of openmindedness. Of course it was also fantastic fun, and I made a lot of friends along the way.



I think it's important for all vet students to gain some idea of global issues, and the role of vets overseas, even if they don't go on to work in the international field. The world is getting smaller, and global issues frequently have ramifications for vets in the UK. I would strongly encourage all students to at least consider doing some of their EMS or research overseas...it was one of the best things I've ever done and may well have shaped my future career!

programmes. The activities of the LIVE (Lifelong, Independent, Veterinary Education)⁵³ centre at the RVC, (which provides MSc and shorter courses in veterinary education) and the establishment in the UK of an annual Veterinary Education Symposium⁵⁴ are examples of an increased commitment to improving the quality of veterinary education in recent years.

Veterinary students can also struggle with learning through these novel pedagogies. As discussed above, students tend to focus their learning on the assimilation of facts and hence are often not accustomed to analysing qualitative evidence, as is often most appropriate when assessing the complex sociological issues involved in global health topics. Skilled direction from teaching staff is therefore required to allow students to develop their abilities in this important area.

Global expertise amongst teaching staff

Where opportunities for learning about global and development issues are found within undergraduate veterinary education, these currently tend to be the result of the experience, passion and commitment of individual educators, rather than formal curriculum structures. Teaching staff who are less familiar with such issues, on the other hand, are much less likely to be confident about bringing global topics into their teaching practice. The passions of globally enlightened individual educators should therefore be fed back to their academic colleagues, as well as to their students. Supporting the professional development of teaching staff through on-site workshops and international professional links, might allow staff with little previous international experience to include a global perspective within their teaching material. As more educators gain global awareness, and include global topics within their teaching practice, a global perspective will become increasingly interwoven within the curriculum as a whole.

Admission of appropriate students

The general public's view of veterinary surgeons tends to be restricted to traditional roles in clinical practice, and there is a lower awareness of the role of vets in public or global health. This is reflected in the attitudes of those applying to veterinary schools. Research by the Royal Veterinary College had shown that of 289 undergraduates who were asked why they had wanted to become a vet, none mentioned food security, public health or human wellbeing as a reason, and only 30% mentioned 'wanting to train as a scientist'⁵⁵. Clearly an important first step in producing veterinary graduates to work in global health fields is to recruit the appropriate students to train for these roles. It may be unrealistic to expect there to be many students with existing interests in global health applying to veterinary schools. However, efforts can be made during the admissions process to actively seek out those students with the potential for non-traditional veterinary careers and particularly those who display the appropriate skill sets. Additionally, several initiatives have recognised the current restricted demographic amongst veterinary students and efforts are underway to improve breadth of applications to veterinary schools. These include the 'Walks of Life' initiative from the Royal College of Veterinary Surgeons^{56,57}, and recruitment diversification or foundation year schemes at many UK veterinary schools⁵⁸.

Lack of defined career paths

Funding for overseas veterinary research and development has reduced significantly in the UK in recent years, as has the availability of overseas positions suitable for veterinary surgeons^{59,60}. Veterinary students with an interest in global topics may be discouraged from pursuing experience in this field as they struggle to see how to go about fulfilling their career aspirations. Others might be discouraged from pursuing such a career due to financial considerations, a concern that will only be exacerbated by the recent rise in tuition fees. The case studies in this report are included to provide students with

some practical examples of global careers, however increased funding and appropriate legislation are also required in order to see more employment prospects for UK vets in global positions.

Relationships with degree accrediting organisations and professional bodies

Veterinary degrees must be accredited by the RCVS in order for veterinary students to be allowed to practise in the UK, and bodies such as the AVMA and the European Association of Establishments for Veterinary Education (EAEVE) for practise in other parts of the world. The requirements of these accrediting organisations are therefore important determinants of the content of the

veterinary curriculum. Global awareness is not currently explicitly listed amongst the RCVS list of 'day one competencies', although, as discussed earlier, there are implicit links to global skills which could be developed. The North American Veterinary Medical Education Consortium (NAVMEC) has made some advances in this area, identifying One Health knowledge as a core competency for all graduating veterinarians in its 2011 inaugural report⁶¹. Clearly, the recognition of global skills as a compulsory component of undergraduate veterinary education by accrediting institutions would be a major driver for improved global and development teaching, and there is therefore a need to encourage the RCVS to address this important area.

Global Veterinary Careers

Alex Tasker, MSc student, University College London

I graduated in 2006 from the Royal Veterinary College, having led the undergraduate research team visit to Guatemala, and carried out EMS in Mozambique and Tanzania. Upon graduation I entered mixed animal veterinary practice, and followed this with a period as a locum vet, developing my business and practice management skills. I then formalised my overseas training through an MSc in Anthropology, Environment and Development at University College London. My MSc studies involved an extensive period of research in Northern Kenya, working alongside Veterinaires Sans Frontieres (VSF). I am currently trying to talk someone into funding an international development PhD!



Vets have a key role in international development, especially through the combination of their 'soft' and 'hard' skill-sets. Vets provide a tangible and vital link between development professionals, policy makers and the day to day problems of herders and farmers. This is primarily achieved through livestock and herd-health channels, but should be able to include political, social and economic factors surrounding these areas. Veterinary medicine equips graduates with a unique and diverse range of abilities. Your time as an undergraduate allows you to explore avenues on offer that you will not be able to easily access once you are in the consulting room or on the yard. I would advise students to look around, contact people and organisations – especially non-veterinary organisations – in order to identify areas that are of interest to you and suit the wide skill-set you will possess as a graduate.

Conclusions

This report has highlighted the broad range of applications of veterinary science on a global scale. It has shown that human, animal and environmental health are interconnected, and that a holistic approach to global health is required. In particular, it has recognised that teaching and learning about global issues allows students to explore the ‘bigger picture’, and to recognise that ecological, social, political, cultural and economic factors all impact on disease and health management. It has also recognised that global factors impact on practice in the UK and that global skills are applicable to all strands of veterinary medicine. It has argued, therefore, that teaching on global and development topics is an important element of education for all veterinary undergraduates.

Alongside giving examples of how such advances in global veterinary education might be achieved, this report also identifies many opportunities for future improvements. Further research is required in order to identify the needs of veterinary students in terms of global education, and to investigate the efficacy of the curriculum interventions used to address them. There is a need for professional development programmes for teaching staff, to allow all educators to identify areas where they can include global knowledge in their teaching, and to equip them with the ability to teach in innovative ways which nurture global skills in their students. It will also be necessary to bring the significance of these issues to the attention of the wider veterinary profession, and in particular to encourage degree accrediting bodies to recognise the importance of the inclusion of global and development topics in the curriculum.

A key global learning outcome, as identified in this report, is the recognition of the importance of interdisciplinary collaboration. Interdisciplinary collaboration has also been a key success of the Student as Global Citizens project. Students have enjoyed the interdisciplinary teaching sessions organised as part of the project, and in turn, the project team has enjoyed the experience

of collaborating with its counterparts in allied professions. The team, involving vets, doctors and pharmacists working together, under the pedagogical guidance of the Development Education Research Centre, and with the support of the London International Development Centre, has been an effective one. The project team intends to continue this collaboration, and would encourage others involved in healthcare education to seek similar partnerships.

In addition to interdisciplinary collaboration, there is also the opportunity for collaboration within the veterinary profession. Veterinary students, educators, practising veterinary surgeons and those working in global fields are encouraged to seek alliances to promote change in this important area.

While there is still much work to be done, there is an emerging recognition by the veterinary profession of the important role that it must play in global health and development. As globalisation continues apace, this role becomes ever more important. We encourage all stakeholders to seize upon this momentum, and ensure that tomorrow's veterinary students will truly be able to graduate as ‘global professionals’.

Further resources on global veterinary medicine and global awareness

An electronic version of this document can be downloaded at:

<http://www.rvc.ac.uk/global>

For more information and to request copies contact Nick Short (nshort@rvc.ac.uk) or Dr. Nicole Blum (n.blum@ioe.ac.uk)

Further publications by Students as Global Citizens project partners:

Willott, C., Blum, N., Burch, W., Page, B., and Rowson, M. (2012) *The Global Doctor*. London: UCL Institute for Global Health and Development Education Research Centre, Institute of Education. Available at: <http://www.ucl.ac.uk/igh/research/publications/pdfs/the-global-doctor>

Blum, N., Francis, S., Munday, M., Murdan, S., Smith, F. and Taylor, J. (forthcoming) *The Global Pharmacist*. London: UCL School of Pharmacy and Development Education Research Centre, Institute of Education.

In addition to the notes and references, the following may be of interest to those exploring teaching and learning about global issues in higher education:

Bourn, D. (2010) 'Students as Global Citizens', in E. Jones, ed. *Internationalisation: the Student Voice*. London: Routledge.

Bourn, D. with Neal, I. (2008) *The Global Engineer*. London: Engineers Against Poverty. Available at: <http://eprints.ioe.ac.uk/839/1/Bourn2008Engineers.pdf>

Bourn, D., McKenzie, A., and Shiel, C. (2006) *The Global University: The role of the curriculum*. London: Development Education Association.

Caruana, V. and Spurling, N. (2007) *The Internationalisation of UK Higher Education: A review of selected material*. Available at: http://www.heacademy.ac.uk/assets/York/documents/ourwork/tla/lit_review_internationalisation_of_uk_he.pdf

Clifford, V. and Montgomery, C. (2011) *Moving Towards Internationalisation of the Curriculum for Global Citizenship in Higher Education*. Oxford: Oxford Centre for Staff and Learning Development.

Shiel, C. (2007) 'Developing and embedding global perspectives across the university' in S. Marshal, ed., *Strategic Leadership of Change in Higher Education*. London: Routledge.

Shultz, L., Abdi, A. and Richardson, G.H. (eds.) (2010) *Global Citizenship Education in Post Secondary Institutions*. New York: Peter Lang.

Sherman, D. (2002) *Tending Animals in the Global Village. A Guide to International Veterinary Medicine*. Lippincott Williams & Wilkens, Philadelphia.

Walsh D. (Ed) (2009) *Veterinary education for global animal and public health*. *Revue Scientifique et Technique (OIE)* 28 (2)

Department of Health. (2007) *Health is Global: Proposals for a UK Government-Wide Strategy*. London: DOH. Available at: http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_088702



References

1. See: <http://www.onehealthcommission.org>
2. See: <http://www.onehealthinitiative.com>
3. Brown, C., Thompson, S., Vroegindewey, G. & Pappaioanou, M. (2006) The Global Veterinarian: The Why? The What? The How? *Journal of Veterinary Medical Education* 33(3) 411-415
4. Fernandes, T. & Lobo-Vilela, C. (2002) VET 2020 prospects for veterinarian profiles: Requirements by the profession and the society. Development of European educational strategies: Design of veterinarian profiles identified by market needs for the year 2020. Socrates Thematic Network project.
5. Willis, N. *et al* (2007) – Envisioning the future of veterinary medical education: the Association of Veterinary Medical Colleges Foresight Project, Final Report. *Journal of Veterinary Medical Education*, 34 (1): 3-41.
6. Workforce Needs in Veterinary Medicine (2012) National Academies Press Available at: http://www.nap.edu/openbook.php?record_id=13413 (accessed on 4th Nov 2012)
7. Comment: Contributing to a healthy future. 2012. *Veterinary Record* 171: 332.
8. DfES [Department for Education and Skills]. (2006) The Leitch Review of Skills, Prosperity for all in the global economy- world class skills. London DfES. Available at: http://www.hm-treasury.gov.uk/d/leitch_finalreport051206.pdf (accessed on 4th Nov 2012)
9. See: <http://www.heacademy.ac.uk/internationalisation>
10. See: <http://www.unesco.org/new/en/education/themes/leading-the-international-agenda/education-for-sustainable-development/>
11. Bourn, D. & Shiel, C. (2009) Global perspectives: aligning agendas?. *Environmental Education Research* 15: 6 661 – 677.
12. Fujikane, H. (2003) Approaches to global education in the United States, the United Kingdom and Japan. *International Review of Education* 49 (91/2): 133-152.
13. Bourn, D. and Blum, N. (forthcoming) Global perspectives for global professionals in the UK: engaging students within engineering and health. *Compare*.
14. Gough, S and Scott, W. (2007) Higher Education and Sustainable Development: London: Routledge
15. See: <http://www.rvc.ac.uk/global>
16. See: <http://www.ioe.ac.uk/research/33594.html>
17. Chomel, B. & Marano, N. (2009) Essential veterinary education in emerging infections, modes of introduction of exotic animals, zoonotic diseases, bioterrorism, implications for human and animal health and disease manifestation In Veterinary education for global animal and public health (D.A. Walsh, ed.). *Revue Scientifique et Technique (OIE)* 28 (2) 559-565
18. Main, D., Appleby, M., Wilkins, D. & Paul E. (2009) Essential veterinary education in the welfare of food production animals. In Veterinary education for global animal and public health (D.A. Walsh, ed.). *Revue Scientifique et Technique (OIE)* 28 (2) 611-616
19. Wall, P. (2009) Essential veterinary education in food safety, food hygiene and biosecurity: a global perspective. In Veterinary education for global animal and public health (D.A. Walsh, ed.). *Revue Scientifique et Technique (OIE)* 28 (2) 493-501
20. Aguirre, A. & Gomez, A. (2009) Essential veterinary education in conservation medicine and ecosystem health: a global perspective. In Veterinary education for global animal and public health (D.A. Walsh, ed.). *Revue Scientifique et Technique (OIE)* 28 (2) 597-603
21. Fanning, S., Whyte, P. & O'Mahony, M. (2009) Essential veterinary education on the development of antimicrobial and antiparasitic resistance: consequences for animal health and food safety and the need for vigilance. In

- Veterinary education for global animal and public health (D.A. Walsh, ed.). *Revue Scientifique et Technique (OIE)* 28 (2), 572-585
22. Brown, C. (2009) Essential veterinary education in the cultural, political and biological complexities of international trade in animals and animal products. In Veterinary education for global animal and public health (D.A. Walsh, ed.). *Revue Scientifique et Technique (OIE)* 28 (2), 519-52
 23. See, for example: Bourn, D. (2008) Global Skills. London: Learning and Skills Improvement Service. Available at: http://www.lsis.org.uk/Documents/Publications/GlobalSkillsNov08_WEB.sflb.pdf
 24. "Summary table of SARS cases by country, 1 November 2002 – 7 August 2003". World Health Organization. Available at: http://www.who.int/csr/sars/country/2003_08_15/en/index.html (accessed on 4th Nov 2012)
 25. Rota, P. et al (2003). Characterization of a novel coronavirus associated with severe acute respiratory syndrome. *Science*. 300 (5624), 1394-1399.
 26. Shi, Z. & Hu, Z. (2008). A review of studies on animal reservoirs of the SARS coronavirus. *Virus Research* 133 (1), 74-87.
 27. Song, H. et al (2005). Cross-host evolution of severe acute respiratory syndrome coronavirus in palm civet and human. *Proceedings of the National Academy of Science U S A* 102 (7), 2430-2435.
 28. International Air Transport Association Annual Review (2012). Available at: <http://www.iata.org/about/Documents/annual-review-2012.pdf> (accessed on 4th Nov 2012)
 29. Food and Agriculture Organisation of the United Nations (2011). Investigating the role of bats in emerging zoonoses: Balancing ecology, conservation and public health interests. Edited by S.H. Newman, H.E. Field, C.E. de Jong and J.H. Epstein. FAO Animal Production and Health Manual No. 12. Rome.
 30. United Nations, Department of Economic and Social Affairs, Population Division (2007). World Population Prospects: The 2006 Revision, Highlights. Working Paper No. ESA/P/WP.202
 31. Delgado, C., Rosegrant, M., Steinfeld, H., Ehui, S. & Courbois C. (1999) Livestock to 2020: the next food revolution. IFPRI Food, Agriculture, and the Environment Discussion Paper 28. Washington, D.C. (USA): IFPRI.
 32. Steinfeld, H., Gerber, P., Wassenaar, T., Castel, V., Rosales, M. & De Haan, C. (2006) Livestock's Long Shadow- Environmental Issues and Options. LEAD/FAO.
 33. Thornton, P., Van de Steeg, J., Notenbaert, A., & Herrero M. (2009) The impacts of climate change on livestock and livestock systems in developing countries: a review of what we know and what we need to know. *Agricultural Systems* 101, 113–127.
 34. Foresight. (2011) The Future of Food and Farming Executive Summary. The Government Office for Science, London. Available at: <http://www.bis.gov.uk/assets/foresight/docs/food-and-farming/11-547-future-of-food-and-farming-summary> (accessed on 4th Nov 2012)
 35. Foresight. (2006) Infectious Diseases: preparing for the future. Executive Summary. Office of Science and Innovation, London. Available at: http://www.bis.gov.uk/assets/foresight/docs/infectious-diseases/e1_id_executive_summary.pdf (accessed on 4th Nov 2012)
 36. RCVS Day One Competences. Available at: <https://www.rcvs.org.uk/document-library/day-one-competences/> (accessed on 4th Nov 2012)
 37. Mills, J., Valet, S. & Fazdar, F. (2011) Cultural Awareness in Veterinary Practice: Student Perceptions. *Journal of Veterinary Medical Education* 38 (3) 288-297
 38. See: <http://www.rvc.ac.uk/Global/Project-Activities/Kenya.cfm>
 39. Suarez-Orozcom, M. & Qin- Hilliard B.(2004) Globalisation; Culture and Education in the New Millennium. Los Angeles: University of California Press.
 40. See: <http://www.rvc.ac.uk/SRT/Index.cfm>
 41. Brown, C., Hird, D., Roth, J., Wagner, G., Jost, C. & Memon, M. (2002) International Opportunities for Veterinary Medicine Students. *Journal of Veterinary Medical Education* 29(4) 220-224

42. Hird, D. (2009) Global thinking and global education: Philosophy, programs, perspectives. *Preventive Veterinary Medicine* 92 (2009) 296–300
43. Overseas EMS guide available at <http://www.rvc.ac.uk/global>
44. Hernandez, J. *et al* (2009) Education of global veterinarians. *Preventative Veterinary Medicine* 2 275–283
45. Renberg, W. (2010) Developing an International Program in a North American Veterinary College. *Journal of Veterinary Medical Education*. 37(4) 340-346
46. Wong, D., & Kogan, L. (2012) Veterinary Students' Attitudes on One Health: Implications for Curriculum Development at Veterinary Colleges. *Journal of Veterinary Medical Education Advance Online Article*.
47. Conrad, P., Mazet, K., Clifford, D., Scott, C., & Wilkes, M. (2009) Vision for a transdisciplinary "one medicine–one health" approach to global health education. In: 2008 Schwabe Symposium Presentation, Vol. 92. pp. 268–274.
48. Chaddock, M. (2012) Academic Veterinary Medicine and One Health Education: It Is More than Clinical Applications. *Journal of Veterinary Medical Education* 39(3) 241-246
49. See: www.medsin.org
50. Johnson, O., Bailey, S., Willott, C., Crocker-Buque, T., Jessop, V., Birch, M., Ward, H. & Yudkin, J. (2012) Global health learning outcomes for medical students in the UK. *Lancet* 379 (9831): 2033-2035
51. Willott, C., Blum, N., Burch, W., Page, B., and Rowson, M. (2012) *The Global Doctor*. London: UCL Institute for Global Health and Development Education Research Centre, Institute of Education. Available at: <http://www.ucl.ac.uk/igh/research/publications/pdfs/the-global-doctor>
52. Halliwell., R, (2009) The responsibilities of veterinary educators in responding to emerging needs in veterinary medicine in Veterinary education for global animal and public health (D.A. Walsh, ed.). *Revue Scientifique et Technique* (OIE) 28 (2), 487-492
53. See <http://www.rvc.ac.uk/education/LIVE.cfm>
54. See <http://www.ed.ac.uk/schools-departments/vet/news-events/events/veted-symposium>
55. Tomlin, J., Brodbelt, D. & May, S. (2010) Influences on the decision to study veterinary medicine: Variation with sex and background. *Veterinary Record* 166, 744-748.
56. See <http://www.walksoflife.org.uk>
57. Andrews, F. (2009). – Approaches to university admissions in the UK to match the expanding needs of the profession and the global society. In *Veterinary education for global animal and public health* (D.A. Walsh, ed.). *Revue Scientifique et Technique* (OIE) 28 (2), 699-707.
58. Andrews, F. (2012) Widening Access to the Veterinary Profession. *Veterinary Record* 170 9-12
59. Comment: Vets with vision needed to ensure a healthy future (2012) *Veterinary Record* 171: 366
60. Roeder, P (2011) Making a global impact: challenges for the future. *Veterinary Record* 169 671-674
61. Roadmap for veterinary medical education in the 21st century: responsive, collaborative, flexible— NAVMEC report and recommendations. Washington, DC: North American Veterinary Medical Education Consortium; 2011 Available at: http://www.aavmc.org/data/files/navmec/navmec_roadmapreport_web_single.pdf. (page 27) (accessed on 4th Nov 2012)

The Royal Veterinary College

Royal College Street
London NW1 0TU

www.rvc.ac.uk

**Development Education
Research Centre**

Institute of Education
University of London
36 Gordon Square
London WC1H 0PD

www.ioe.ac.uk/derc

For more information and to request copies contact Nick Short (nshort@rvc.ac.uk) or
Dr. Nicole Blum (n.blum@ioe.ac.uk)