Teaching the Concepts of One Health

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One Health Concept

• The One Health concept is a worldwide strategy for expanding interdisciplinary collaborations and communications in all aspects of health care for humans, animals and the environment.\(^1\)

• "Human or livestock or wildlife health can't be discussed in isolation anymore. There is just one health. And the solutions require everyone working together on all the different levels." \(^2\)

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1 One Health Initiative. [www.onehealthinitiative.com/about.php](http://www.onehealthinitiative.com/about.php)
2 William Karesh, 2003
One Health Concept

• OIE has been one of the global leaders in recognising that an understanding of the principles of One Health should be at the core of veterinary education.

• The North American Veterinary Medical Education Consortium (NAVMEC) recommended that all veterinary students achieve competency in One Health related to the intersection of animal, human and environmental health before graduation[^3]

[^3]: Roadmap for Veterinary Medical Education in the 21st Century. [www.aavmc.org/roadmap](http://www.aavmc.org/roadmap)
Scope of this presentation

- Our experiences teaching the concepts of One Health in New Zealand and South Asia (Afghanistan, Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka).
- Results of a survey of veterinary colleges in South Asia on interdisciplinary engagement and incorporation of One Health in undergraduate and postgraduate teaching and research.
- Perceptions on how OIE Day-1 Competencies related to One Health pertaining to zoonoses, food-borne diseases and food hygiene, are taught in undergraduate teaching programs in a sample of South Asian veterinary schools.
Teaching One Health at Massey

Undergraduate veterinary science at Massey University

• Core program of integrative and problem-based learning (PBL) runs through all years of the curriculum.

• Input from public health, animal science, agricultural and environmental science, biosecurity, animal welfare and bioethics, psychology and communications practitioners and researchers.

• Underpinned by a strong culture of interdisciplinary inquiry and research.

• No specific curriculum component for One Health per se.
Undergraduate veterinary science at Massey University

Topics related to OIE Day-1 Competencies for zoonoses, food-borne disease and food hygiene:

• Are included in integrative problem-based learning.
• Are taught in all 5 years of the undergraduate program.
• Constitute an estimated 0.6%, 4.2%, 5.8%, 13.0%, 10.0% of the total content taught in years 1, 2, 3, 4 and 5 respectively (average 6.7%).
• OIED1C are assessed as attained by 100% of NZ veterinary graduates.
Interdisciplinary Research

Active One Health research network One Health Aoteoroa and NZ Food Safety Science and Research Centre involving:

• Academics and researchers from across the fundamental and applied sciences, humanities and social sciences, and business colleges at Massey University.

• Formal partnerships with other national research organisations including Crown Research Institutes and both Faculties of Medicine in NZ (University of Auckland & University of Otago).

• National coordination of interdisciplinary research in food safety, food-borne disease and food hygiene.
Teaching One Health at Massey

Postgraduate programs

• Using a One Health approach to infectious disease epidemiology, biosecurity and disease control policy and economic evaluation for priority zoonoses.

• The core design principle is “education into action”
Combining into a **One Health Epidemiology Fellowship Program**:
  – cohort-based Master’s degree education
  – Professional engagement and strengthening of multi-sectoral collaborative frameworks
  – practical application of knowledge and skills to epidemiological investigation and disease control policy evaluation
  – Train-the-trainer activities
One Health Epidemiology Fellowship Program
Students and Host Organisation Representatives 2014 - 2016
Key Components
Integrating Education & Action

• Joint education of human, animal and wildlife health professionals to Master’s degree level
  – MVM / MPH (Biosecurity), MSc (One Health)
  – Flexible, cohort-based, delivered in-country and can be completed in-service

• Collaborating with national institutions in-country
  – Institutional capacity building
  – Extend operational training to wider stakeholder groups

• Applied focus on priority zoonoses
  – Situation assessment & applied epidemiology research
  – Economics and disease control policy evaluation
Key Components
Integrating Education & Action

• Collaborative Investigation Projects (CIPs)
  – focused on needs and priority zoonoses
  – Structured methodologies, mentoring and reporting

• Generate outputs to inform disease control policy evaluation and economic analyses for endemic zoonotic diseases

• Projects form the focus for further expert assistance and operational training

• Broaden engagement through national and regional workshops and symposia
Key Components
Integrating Education & Action

Cohort approach

• Develops skilled cohorts nationally and regionally

• Builds cross-sectoral knowledge, relationships & understanding

• Cohorts provide a key resource for future collaborative activities and specialised training

• ‘Educate the educators’ – graduates trained to develop and deliver training materials for national use

• Cohorts function very effectively when return to service
Teaching One Health at Massey

Postgraduate programs

• To date: three capacity building programs funded by the European Union and World Bank have been delivered in South Asia, China and Mongolia since 2010

• 2–4 years in duration

• 108 public health, animal health and wildlife health professionals graduated to date.

• 2,200 participants involved in zoonotic disease investigations and policy evaluations across the region
Teaching One Health in South Asia

Undergraduate Veterinary Education

• Survey sent to 23 state veterinary colleges or universities in the South Asian countries of Afghanistan, Bangladesh, India, Nepal, Pakistan and Sri Lanka.

• Participants identified through the One Health Network South Asia established during the Regional Training in Animal and Human Health Epidemiology in South Asia program implemented by Massey from 2010–2014, or selected within South Asian countries from AVMA-listed veterinary colleges.
Teaching One Health in South Asia

Responses received:

- Afghanistan 2 from 2
- Bangladesh 2 from 3
- India (12 states) 6 from 12
- Nepal 2 from 2
- Pakistan 3 from 3
- Sri Lanka 1 from 1

Total 16 from 23 = 70%
Teaching One Health in South Asia

Undergraduate Veterinary Education

• Estimated percentage of the total degree program content that related to ZD, FBD and FH
  – averaged 6.1% (median 4.7%, range 0.3%–15.3%).

• Subjects relating to ZD, FBD and FH
  – most commonly taught in four of the five years of study
  – in almost all programs (93%) in Years 3 and 5

• The greatest percentage of content relating to ZD, FBD and FH was taught in Year 3
Teaching One Health in South Asia

• Use of a problem-based learning approach for teaching ZD, FBD and FH was reported by 7/16 (44%) colleges.

• Interdisciplinary teaching of veterinary and medical or public health students was reported by 5/16 (31%) colleges.

• 5/16 and 5/16 (31%) provided opportunities for veterinary students to participate in collaborative investigations related to public health or wildlife, respectively.

• One Health postgraduate certificate, diploma or Master’s degree programs were offered by 2/16 (12%) colleges.

• 9/16 (56%) reported conduct of One Health research.
### Percentage of South Asian veterinary colleges surveyed that estimated their graduates attained Day-1 Competencies

<table>
<thead>
<tr>
<th>Competency related to zoonoses (ZD), food-borne disease (FBD) or food hygiene (FH)</th>
<th>Estimated % graduates achieving competency</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Identify the clinical signs, transmission and pathogen associated with common ZD &amp; FBD diseases</td>
<td>&lt;25% &lt;50% &gt;50% &gt;75% 100%</td>
</tr>
<tr>
<td>7</td>
<td>27</td>
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<tr>
<td>b) Use or explain the use of current diagnostic and therapeutic tools for common ZD &amp; FBD</td>
<td>20</td>
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<tr>
<td>c) Understand implications of ZD &amp; FBD for human health and where to up-to-date find information</td>
<td>13</td>
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<tr>
<td>d) Understand regulatory implications of ZD &amp; FBD and pathogens and where to up-to-date find information</td>
<td>20</td>
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<td>e) Understand and explain on-farm food safety practices</td>
<td>13</td>
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<td>f) Participate in slaughter inspection, including ante-mortem, post-mortem and humane slaughter</td>
<td>27</td>
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<tr>
<td>g) Understand &amp; explain integration of AH controls, PH &amp; the role of vets, physicians, PH practitioners &amp; risk analysts to ensure food safety</td>
<td>13</td>
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</tbody>
</table>
Teaching One Health in South Asia

All respondents reported:

• Positive awareness and attitude towards the One Health concept and its importance in undergraduate veterinary education.

• The concept of One Health was generally understood by the majority of graduates but to quite variable degrees.

• Practical applications were much less well understood at the undergraduate level.

• A strong One Health focus was apparent from responses of 4/16 (25%) colleges.
Comments generally reflected:

• Little or no coordination or collaboration on undergraduate teaching of veterinary and medical students.

• Both a need and support for including for-credit or non-credit courses, case studies and practical experience specifically related to One Health concepts in the undergraduate curriculum.

• Support for collaborative teaching and projects for undergraduate veterinary and medical students, and for greater exposure of undergraduate students to One Health activities locally, nationally and internationally.
Conclusions

• The concept of One Health is understood by the majority of veterinary graduates in NZ and South Asia.

• There is little or no specific inclusion of One Health concepts or practicums in undergraduate curricula, or coordination or collaboration on undergraduate teaching of veterinary and medical or public health students.

• Estimated attainment of OIE Day-1 Competencies related to One Health by graduates in South Asia is highly variable.

• Significant opportunity exists for revising curricula and pedagogies to more specifically include One Health concepts and their application and improve competencies.
Teaching the Concepts of One Health

“Veterinary medicine must become a leader in One Health. This may be the single most important new opportunity for the profession for the foreseeable future and in particular for academic veterinary medicine”[1]

“One Health, One Thinking”[2]

1. Roadmap for Veterinary Medical Education in the 21st Century. www.aavmc.org/roadmap
2. Dr Dorji Wangchuk, Secretary for the Ministry of Health, Royal Government of Bhutan
Acknowledgements

Survey Respondents (Deans and Senior Faculty) from:

• Kabul University, Afghanistan
• Nangarhar University, Afghanistan
• Bangladesh Agricultural University, Mymensingh, Bangladesh
• Chittagong Veterinary & Animal Sciences University, Bangladesh
• Himachal Pradesh Agricultural University, (CSKHPKV), India
• Lala Lajpat Rai University of Veterinary & Animal Sciences, Haryana, India
• Guru Angad Dev Veterinary & Animal Sciences University, Ludhiana, India
• Maharashtra Animal and Fisheries Science University, Nagpur, India
• Sher-e-Kashmir University of Agricultural Sciences and Technology, Jammu, India
• Tribhuvan University, Nepal
• Agriculture and Forestry University, Nepal
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Thank you

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