

# Integrating the issues of world animal health and world public health into the veterinary curriculum: a Southeast Asian perspective

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## Summary

The authors analysed the curricula of five veterinary schools in Southeast Asia to determine how successfully they integrate the issues of global animal health and global public health into their programmes. Two schools offer a five-year programme while the remaining three offer a six-year programme. The core courses within the curricula range from 145 to 224 credit hours, in total. In general, world animal health and world public health are well integrated into the veterinary curriculum. Most curricula allocate approximately 3% of their total credit hours to subjects associated with animal and public health, but other subjects that may contain discussions on these issues range between 6% and 10%. Most veterinary schools in Southeast Asia offer a Master's programme in Veterinary Public Health, with detailed emphasis on animal and public health but focusing principally on topics of local importance. At the same time, undergraduate and post-graduate veterinary students are exposed to current issues in animal and public health through regional and international scientific meetings.

## Keywords

Animal health – Curriculum – One World, One Health – Public health – Southeast Asia – Veterinary curriculum – World animal health – World public health.

## Introduction

World animal health and public health have caught world attention in recent years. Global changes, which include climate change and climate variability, changes in land use, water storage and irrigation, human population growth and urbanisation, increased trade and travel and chemical pollution, change the development and transmission of disease (15). The highly pathogenic H5N1 avian influenza virus, for example, which is now widespread in Southeast Asia and which has recently extended to the Balkans and Western Europe, has alerted the public to the potential

occurrence of a severe new influenza pandemic. It has been shown that air transportation is instrumental in increasing the probability of global disease outbreaks (7).

Over the last two decades, concern has been expressed about the readiness of the public health workforce to adequately address the scientific, technological, social, political and economic challenges facing global animal and public health (17). There have been calls to increase the relevance of public health education and training, prompting a renewed effort to identify the competencies needed by public health personnel and the organisations that employ them (3).

This report analyses the veterinary curricula of five Southeast Asian veterinary institutions to determine how effectively they integrate the issues of world animal health and world public health into their programmes. The curricula examined were those of:

- Putra University (Malaysia)
- Airlangga University (Indonesia)
- Chulalongkorn University (Thailand)
- the University of the Philippines (Los Baños, the Philippines)
- the University of Veterinary Science (Myanmar).

## The veterinary curriculum

All the selected schools, except the University of Veterinary Science, Myanmar, offer a Doctor of Veterinary Medicine (DVM) programme, with core courses that total between 150 and 200 credit hours. Three of the five offer a six-year programme. The Faculty of Veterinary Medicine, Universiti Putra Malaysia, offers a five-year DVM programme, consisting of a total of 171 credit hours, with 159 of these hours in core courses. The Faculty of Veterinary Medicine, Airlangga University, Indonesia, offers a five-year DVM programme. Students must complete a total of 145 credit hours of core courses within the first four years for a Bachelor's Programme, before being admitted into a one-year programme of exposure to clinical practice, known as 'co-assistance', valued at 35 credit hours, to complete the DVM.

The Faculty of Veterinary Science, Chulalongkorn University, Thailand, offers a six-year DVM programme, with a total of 244 credit hours required for graduation. The core courses, however, are 208 credit hours. The College of Veterinary Medicine, University of the Philippines, Los Baños, offers a six-year DVM programme, consisting of a two-year pre-veterinary course and a four-year professional veterinary curriculum. The pre-veterinary programme requires 76 to 78 credit hours of general education courses, while the professional veterinary curriculum requires the completion of 163 credit hours of veterinary courses, for a total of 239 to 241 credit hours, before a DVM is awarded. The University of Veterinary Science, Myanmar, offers a five-year Bachelor of Veterinary Science, with 282 credit hours in all; 224 of those hours coming from core courses.

Subjects of local interest, particularly local history and local veterinary scenarios, are integrated into the veterinary curricula of all five selected schools. Animal science is also a component of all the selected veterinary curricula.

## Integration of world animal health and world public health into the curriculum

Undergraduate veterinary curricula in Southeast Asia stress the concepts and principles of veterinary public health and food hygiene, with an emphasis on the local context and circumstances. Table I compares the major core subjects offered by various veterinary curricula in Southeast Asia. Of a total of 159 credit hours of core courses offered by Universiti Putra Malaysia, only 4 (2.5%) credit hours are allocated to subjects directly related to veterinary public health. The veterinary public health course is available in the fourth year of the curriculum. It deals not only with zoonotic diseases of local interest but also with food hygiene. On the other hand, global animal health issues are incorporated indirectly into various other subjects, including epidemiology and veterinary preventive medicine (10). At least five subjects, with a total of 12 (8%) credit hours, may contain small components of global animal health issues. These include:

- infection and immunity
- veterinary jurisprudence
- veterinary problem investigation
- veterinary epidemiology
- veterinary disease diagnosis.

The curriculum of Airlangga University, Indonesia, specifically provides:

- 2 credit hours (1.4%) to discuss zoonoses
- 4 credit hours (2.5%) for veterinary public health
- 2 credit hours (1.4%) for veterinary food hygiene.

Related subjects, totalling 18 credit hours (10%), may also discuss global animal health issues. These subjects include:

- infectious diseases
- veterinary clinical diagnosis
- veterinary legislation
- veterinary epidemiology.

The curriculum of Chulalongkorn University does not have a required course in veterinary public health issues. Instead, it offers an elective subject of veterinary public health practice, valued at 2 credit hours (1%). However, a subject closely related to veterinary public health, zoonoses, is being offered in the core courses, at 3 credit hours (1.4%). Global animal health issues are indirectly incorporated into several animal health subjects, including:

- veterinary vaccinology
- diagnostic practice
- pathobiology
- veterinary epidemiology and preventive medicine
- veterinary jurisprudence.

**Table I**  
**A comparison of major core subjects in the veterinary curricula of five universities in Southeast Asia**

Course title	Credit hours				
	Universiti Putra Malaysia	Airlangga University, Indonesia	Chulalongkorn University, Thailand	University of the Philippines, Los Baños	University of Veterinary Science, Myanmar
Introduction to the veterinary profession	1	21	–	3	–
Veterinary biochemistry	4	4	5	5	10
Veterinary anatomy	12	14	18	15	22
Veterinary physiology	9	4	9	8	12
Animal nutrition	3	4	2	3	–
Ruminant production	3	2	5	3	12
Non-ruminant production	4	2	4	6	22
Veterinary genetics	3	2	2	3	–
Livestock management	2	2	2	3	30
Veterinary pathology	11	9	7	7	20
Veterinary microbiology	7	8	6	7	20
Veterinary jurisprudence	2	2	1	2	–
Veterinary parasitology	5	8	6	8	10
Veterinary pharmacology	4	9	6	8	10
Infection and immunity	2	8	3	2	–
Veterinary problem investigation/ case reports	1	–	3	2	–
Farm practice	2	6	13	17	8
Clinical skill and medicine	35	20	39	41	23
Surgery	8	5	11	10	20
Veterinary imaging	2	2	4	1	–
Veterinary clinical pathology	3	3	5	3	–
Veterinary theriogenology	3	13	6	7	10
Veterinary epidemiology	3	2	3	3	3
Laboratory practice	4	2	8	–	–
Veterinary public health	4	12	8	6	8
Research methods and statistics	3	6	–	3	–
Entrepreneurship	–	2	–	–	–
Veterinary business	3	2	–	–	–
Wildlife medicine	2	2	2	2	–
Aquatic medicine	4	2	5	–	4
Final-year project	3	13	2	6	–
Applied veterinary science	3	3	–	–	–
Laboratory animal science	–	–	2	2	–
Veterinary environmental health	–	2	2	–	–

In all, these courses total approximately 9 (5%) credit hours.

The curriculum of the College of Veterinary Medicine, University of the Philippines, Los Baños, allocates 4 credit hours (2.5%) to the subject of food hygiene and 2 credit hours (1%) to zoonoses, both of which discuss issues of public health. A 2 credit hour (1%) course called 'perspective in veterinary public health' is offered as an elective. Similarly, a total of 12 credit hours (7%) allocated

to other subjects may include components of animal health and public health. These subjects include:

- immunology
- epidemiology
- veterinary medicine
- veterinary jurisprudence.

The University of Veterinary Science, Myanmar, allocates a total of 8 credit hours (3.6%) to the subject of veterinary public health. It does not offer any other closely related

subjects, such as zoonoses, but dedicates 13 credit hours (6%) to subjects that may also discuss issues of animal and public health.

## Integration of world animal health and world public health into the post-graduate curriculum

Among the five universities discussed in this report, four offer a Master's programme in Veterinary Public Health to address local needs:

- Universiti Putra Malaysia
- Airlangga University, Indonesia
- Chulalongkorn University, Thailand
- the College of Veterinary Medicine, University of the Philippines, Los Baños.

Universiti Putra Malaysia, offers a 12-month Master of Veterinary Medicine (MVM) programme, specialising either in veterinary clinical practice or veterinary laboratory practice, which includes veterinary public health. The programme consists of course work, with a total of 30 credit hours. Similarly, Airlangga and Chulalongkorn Universities offer a 36-credit Master of Science (MSc) in Veterinary Public Health. The University of the Philippines, Los Baños, through its graduate school, also offers a two-year MSc programme in Veterinary Medicine, with nine major areas of specialisation:

- veterinary anatomy
- internal medicine
- microbiology
- parasitology
- pathology
- physiology
- public health
- surgery
- theriogenology.

The MSc degree course in Veterinary Medicine consists of 9 credit hours of core courses, 10 credit hours of major courses, 9 credit hours of minor courses, and 6 credit hours allocated to a thesis, to be written in the major area of specialisation, for a total of 34 credit hours. All four Masters' programmes cover advanced study (with minor differences) in:

- veterinary epidemiology
- zoonoses
- food hygiene
- jurisprudence
- veterinary microbiology.

These programmes are aimed at strengthening the capability of Veterinary Services in the areas of animal health and protection, food safety and the environment (14) and meeting the challenges posed by new trends in veterinary public health, as reported by the World Health Organization (17).

## Discussion

Several decades ago, the call came for an improved undergraduate veterinary curriculum in developing countries, to prepare veterinarians for such veterinary public health issues as:

- meat inspection
- disease control in live animals
- control of animal diseases that could be communicated to humans (1, 5).

Most curricula responded to this challenge, and today veterinary curricula in Southeast Asia offer courses that lay a sound foundation for veterinary preventive medicine and public health training. However, the importance of zoonoses, food safety and veterinary preventive medicine was re-emphasised during a recently concluded meeting of the Asian Association of Veterinary Schools (13). This renewed challenge will, it is hoped, result in most graduates of veterinary schools in Asia gaining extensive training in population health, preventive medicine and zoonotic diseases, equivalent to that being planned in many veterinary colleges in the United States of America (11).

While foundation courses in veterinary public health and preventive medicine are included in the undergraduate curricula of many veterinary schools in Southeast Asia, more advanced and specialised training is laid out in the Master's programme (8). The International Conference of the Association of Institutes for Tropical Veterinary Medicine recognised the need for an MSc programme in Veterinary Public Health in Southeast Asia (2). As a consequence, in 2003, a joint MSc programme was offered for the first time by the Freie University of Berlin and Chiang Mai University in Thailand. The 24-month course comprises a total of 120 credit hours. At the same time, MSc programmes in Veterinary Public Health are also offered by some veterinary schools in Southeast Asia to cater for local requirements. Needless to say, these programmes tend to concentrate on local veterinary scenarios and circumstances.

The integration of world animal and public health issues into the veterinary curriculum is not only achieved formally, through degree courses, but also indirectly, through international meetings. Most regional scientific

meetings since 1994 have laid a particularly strong emphasis on animal and public health issues (13, 16). These meetings provide special sessions to discuss such topics as avian influenza (9), emerging infectious diseases (4, 12), the effects of globalisation on animal and public health (11) and Nipah virus infection (6). Such sessions effectively enhance undergraduate and post-graduate understanding on the current issues in animal and public health.

Overall, therefore, the issues of animal and public health have been well integrated into the curriculum of veterinary schools in Southeast Asia. All undergraduate curricula offer foundation courses in public health and preventive medicine. In addition, some veterinary schools offer MSc programmes in response to market demand. However, the emphases placed on various issues differ from school to school. ■

## L'intégration des questions relatives à la santé animale mondiale et à la santé publique mondiale dans les programmes d'enseignement vétérinaire : la situation en Asie du Sud-Est

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### Résumé

Les auteurs de cet article analysent les programmes d'enseignement de cinq facultés de médecine vétérinaire d'Asie du Sud-Est, afin de déterminer si ces facultés ont intégré avec succès l'étude de la santé animale mondiale et de la santé publique mondiale dans leurs programmes. La durée du cursus est de cinq ans dans deux des facultés examinées et de six ans dans les trois autres. Les programmes de base totalisent un nombre d'heures allant de 145 à 224 unités de valeur. En général, les questions relatives à la santé animale mondiale et à la santé publique mondiale sont bien intégrées dans ces formations. La plupart des programmes consacrent environ 3 % des unités de valeur à des matières liées à la santé animale et à la santé publique ; les autres matières du programme susceptibles d'aborder ces questions représentent entre 6 % et 10 % des unités de valeur. La plupart des facultés vétérinaires d'Asie du Sud-Est proposent un master en santé publique vétérinaire ; tout en mettant l'accent sur la santé animale et la santé publique, cette formation reste axée sur des questions d'intérêt local. Parallèlement, les étudiants qui préparent le doctorat en médecine vétérinaire ou qui suivent une formation postdoctorale ont la possibilité de suivre les évolutions en matière de santé animale et de santé publique en participant à diverses réunions scientifiques d'envergure régionale et internationale.

### Mots-clés

Asie du Sud-Est – Programme d'enseignement – Programme d'enseignement vétérinaire – Santé animale – Santé animale mondiale – Santé publique – Santé publique mondiale – Un monde, une seule santé. ■

## Incorporación de la sanidad animal y la salud pública mundiales en los planes de estudios de veterinaria del sudeste asiático

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### Resumen

Los autores examinaron los planes de estudios de cinco escuelas veterinarias del sudeste asiático para determinar si incorporaban adecuadamente los problemas de la sanidad animal y la salud pública mundiales en sus programas. En dos de ellas, la duración de los estudios es de cinco años; en las tres restantes de seis. En total, esas escuelas dedican entre 145 y 224 horas/crédito a las tres materias fundamentales. Por lo general, los planes de estudios veterinarios contemplan adecuadamente la sanidad animal y la salud pública mundiales. En la mayoría de ellos, se consagra aproximadamente un 3% del total de horas/crédito a esos temas, así como entre el 6% y el 10% a otras materias conexas. La mayoría de las escuelas del sudeste asiático cuenta con másteres en salud pública veterinaria, en los que se hace un particular hincapié en la sanidad animal y la salud pública, pero que suelen estar dedicados a asuntos de interés local. Asimismo, se organizan reuniones científicas regionales e internacionales sobre problemas zoonosarios y de salud pública para los estudiantes universitarios y de posgrado.

### Palabras clave

Plan de estudios – Plan de estudios veterinarios – Salud pública – Salud pública mundial – Sanidad animal – Sanidad animal mundial – Sudeste asiático – Un mundo, una salud.



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