



One health in our backyard: Design and evaluation of an experiential learning experience for veterinary medical students



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ABSTRACT

Background: New educational approaches are needed to improve student understanding of the wider socio-logical and ecological determinants of health as well as professional responsibilities in related areas. Field trips allow students to observe interaction between plant, animal and human communities, making them an ideal tool for teaching One Health concepts.

Methods: Veterinary medical students participated in a field trip to a local parklands area, frequented by humans, dogs, horses, and wildlife. Students rotated through 5 learning activities ('stations') that focused on: (1) response to exotic animal disease incursion (equine influenza); (2) impact of cultures and belief systems on professional practice; (3) management of dangerous dogs; (4) land use change, biodiversity and emerging infectious disease; and (5) management of environmentally-acquired zoonoses (botulism). Intended learning outcomes were for students to: evaluate the various roles and responsibilities of veterinarians in society; compare the benefits and risks associated with human-animal and animal-animal interactions; and evaluate the contributions made by various professionals in safeguarding the health and welfare of animals, humans and the environment. Following the field trip, students participated in a debrief exercise and completed an online survey on their experiences.

Results: Feedback from students collected in 2016/2017 (n = 211) was overwhelmingly positive. The learning experience at each station was rated as 4 ('Good') or 5 ('Very Good') out of 5 by 82–96% of students. Responses to closed- and open-ended questions – as well as outputs generated in the debrief session – indicated that students achieved the learning outcomes. Overall, 94% of students agreed or strongly agreed that they had a better understanding of One Health because of the field trip.

Conclusions: Field trips to local parklands are effective in promoting learning about One Health and can be incorporated into the core curriculum to maximize student exposure at relatively low cost.

1. Introduction

Following decades of improvements to population health in many countries, the world is faced with a number of formidable threats to global health, including antimicrobial resistance, emerging infectious diseases, food security, biodiversity loss and climate change [1–4]. Many of these problems reflect the complex interplay between human, animal and environmental health and their solutions lie in collaborative approaches that draw on expertise from a wide range of disciplines (so-called "One Health"; [5]). Within the health professions, some have

questioned whether modern curricula are equipping medical and veterinary medical graduates to tackle these challenges [6,7], arguing that the narrow technical focus of these programs is producing graduates with a limited understanding of the wider sociological and ecological contexts of population ill-health [6,8].

To be effective leaders in these areas, medical practitioners and veterinarians must have an appreciation for the interdependency of human, animal and environmental health (systems thinking) as well as the social, political, legal and cultural environments in which they work [9,10]. They also need to be able to assess and manage interactions

Abbreviations: CPE, Centennial Parklands Experience; CPEC, Centennial Parklands Equestrian Centre; DVM, Doctor of Veterinary Medicine; IPE, Interprofessional Experience; MPH, Masters of Public Health

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between humans, animals and their environment [11] and work in multidisciplinary teams with an understanding of and appreciation for the different roles and responsibilities of various stakeholders [9]. While there have been numerous calls to reform medical [6,12] and veterinary medical [7,13,14] curricula to incorporate these core competencies, there are relatively few accounts in the literature of how this can be achieved.

Various models have been proposed and/or adopted to address these curricular deficiencies. Some universities have established dual degree programs (e.g. DVM/MPH; [15,16]) and stand-alone Masters programs focusing on One Health (e.g. University of Edinburgh, University of London). While these initiatives are important, they place increased demands on students and enroll fairly small numbers, making them less impactful at the professional level. Others have proposed or established opportunities for multidisciplinary interaction through the core curriculum – such as through taking common (pre-clinical) coursework [8,17] or participating in interprofessional experiences (IPE) [18–20]. These require considerable coordination across programs and, at many universities, may not be easily achievable in the short term, given time, logistic and geographic constraints. Further, and as noted by Courtenay et al. [20], most of the IPE initiatives described to date have focused on improving human patient care through enhanced understanding of the social determinants of health, with the role of animals and the physical environment rarely considered in these initiatives. Indeed, environmental science training is often lacking entirely from medical and veterinary medical curricula [8].

Field trips – which we define here as an off-campus visit under the supervision of one or more faculty member(s) – are common in natural science and anthropology curricula and allow students to observe interactions between plant, animal and human communities in their natural setting [21]. Educational goals of field trips vary but can include: promoting application and consolidation of classroom learning; deepening conceptual development; encouraging group interaction (both teacher, student and peer); and stimulating appreciation for and valuing of the environment [21,22]. We therefore believe they are a suitable model for teaching One Health. However, field trips are uncommon in clinical degree programs. Some universities have established summer institutes [23,24] and field school programs [25] which combine didactic learning with an international immersion experience in a developing country, as a means to promote learning in cultural competency and One Health. Such experiences may offer similar benefits to field trips but they are costly and often available to only a limited number of students. Further, while international experience is essential for addressing global health challenges, it is equally important to design local educational experiences, to promote equity and engagement by all students, as well as stimulate thinking about One Health issues in the more immediate vicinity.

In this paper we describe the design and evaluation of a One Health field trip undertaken by all veterinary medical students in the first week of their professional degree at the University of Sydney. Uniquely, this activity capitalizes on public parklands close to the main campus. The intended learning outcomes of the field trip were for students to:

1. Evaluate the various roles and responsibilities of veterinarians in society;
2. Compare the benefits and risks associated with human-animal and animal-animal interactions;
3. Evaluate the contributions made by various professionals, including veterinarians, in safeguarding the health and welfare of animals, humans and the environment.

2. Material and methods

2.1. Setting

The Doctor of Veterinary Medicine (DVM) at the University of

Sydney is a 4-year graduate degree program introduced in 2015. Around 60% of the students enter the DVM via the combined Bachelor of Veterinary Biology/DVM program (6 years duration). During the planning phase for the degree One Health was identified by faculty members as an essential underlying theme for the DVM. Introduction of core One Health concepts at the beginning of the degree was therefore deemed a priority, so as to create a scaffold and shape the lens through which students engaged with their veterinary medical training.

The Centennial Parklands Experience (CPE) is a full-day field trip which takes place at the end of the first week of the DVM (February each year). Accessible by public transport, the Centennial Parklands are located in eastern Sydney, approximately 3.5 km from Sydney's Central Business District and 4.5 km from the University. The Parklands encompass three connecting public parks: Centennial Park, Moore Park and Queen's Park. Centennial Park comprises open space, lightly wooded areas, swamp and ponds set over an area of 2.2 sq km. It was officially opened in 1888, marking 100 years since European settlement.

Today, Centennial Park is used by many animals that visit (humans, dogs, horses) or live (waterfowl, fruit bats [“flying-foxes”]) in the park, which is rich with flora and waterways. The park is an important part of the social landscape of Sydney, with people of diverse cultural backgrounds using the space for a variety of reasons (e.g. fitness and recreation, celebration of special occasions); an estimated 200 million visits take place each year. Like any ecosystem there is potential for interactions between humans, domestic and wild animals, and the surrounding environment. Traffic principally occurs along a 3.8 km circular road (Grand Drive) that passes through the park and has dedicated lanes for car drivers, cyclists, pedestrians and horse riders. Off-leash walking of dogs is permitted in designated areas. Equestrian facilities in the Park include the riding track that loops through the park alongside the Grand Drive, as well as dressage and show-jumping arenas. These are used by both commercial operators (e.g. park rides, riding lessons) and private horse owners. Horses are stabled in the Centennial Parklands Equestrian Centre (CPEC), which is set within the adjacent Moore Park.

2.2. Learning activities and logistics

Students are allocated into ten groups (~12–14 students each) and rotate through activities at five stations (described below) which are strategically placed within the Parklands. Given that students are only in the first week of their veterinary medical degree program, activities at each station are designed to draw on common knowledge and provide only the minimal information needed for students to engage with the discussion. Each activity lasts 45–50 min after which students walk, as a group, to the next station using the map provided (see Supplementary material). The CPE has been replicated each year since 2015 and is coordinated and facilitated by faculty members within the School of Veterinary Science. Each station has a minimum of two facilitators, enabling two groups to run simultaneously at each station. Additionally, two faculty members and an administrative staff member assist with logistical preparations and are available to address matters that arise on the day. Financial costs associated with the field trip (borne by the school) relate to purchase of stationary, lunch and on-off supplies (e.g. audio speakers, easels) (~AUD600 annually). Students are encouraged to use public transport and bring items for personal use (e.g. sunscreen, towel to sit on).

2.3. Station 1: Equestrian Centre (equine influenza)

The learning focus at this station is the role of the veterinary medical profession in relation to disease control, including the legal obligation to report notifiable diseases (developed by JAT). The station is located within CPEC which includes several large stable pavilions (accommodating up to 200 horses), a veterinary clinic, riding arenas,

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