

News from the IAEH

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ACHIEVING TRANSDISCIPLINARY ECOHEALTH EDUCATION IN EARLY PROFESSIONAL DEVELOPMENT

Non-sustainable natural resource extraction has continued to heavily impact individual species and entire ecosystems. Exponential human population growth intensifies these anthropogenic pressures, facilitating more extensive overlap of humans, domestic animals, and wildlife. Despite this reality, the intimate connections among human, animal, and ecosystem health remain poorly understood. Thus, educating professionals with diverse backgrounds and promoting collaborative and transdisciplinary research activities will be vital in addressing current Ecohealth issues.

Emerging Ecohealth challenges often arise more frequently than our ability to diagnose causes and make management decisions. For example, in the cases of avian vacuolar myelinopathy in waterfowl and raptors and white-nose syndrome in chiropterans, thousands of animals perished before we understood pathogenesis, morbidity, and causes of mortality. To address these issues, professionals from multiple disciplines are needed to confront current and future conservation challenges. The conventional methods used in epidemiological research, which treat outbreaks as isolated events and rarely link disease agents with environmental or animal sources, are insufficient. The need to account for complex host–pathogen interactions within altered ecosystems has led to Conservation Medicine which recognizes such interconnections.

As Conservation Medicine calls for integrating ecology, conservation biology, and biomedical science, professionals involved in this field have acquired knowledge in spatial analysis, population dynamics, evolutionary biology, and epidemiology either through multiple degrees or empirical experience. If such training in the aforementioned fields was

provided within undergraduate curricula, then emerging EcoHealth challenges could be approached more effectively and with a higher probability of success. Such exposure during the formative stage for future professionals would certainly provide tools for problem solving that would be essential later in professional practice and would help us combat the disciplinary preconceptions, hierarchical structures, and financial and time constraints that have stood in the way of truly transdisciplinary EcoHealth efforts.

Currently, EcoHealth and Conservation Medicine training is taught in educational institutions as formal graduate-level degrees, through incorporating elective courses into curricula, and through dual-degree programs (e.g., MD/PhD, DVM/PhD, or DVM/MPH). In Europe and Latin America, veterinary degrees are obtained at the undergraduate level, exposing students early in their careers to Ecohealth subjects beyond the classical fields of biology or chemistry. However, in the U.S., undergraduate students can acquire exposure through both curricular and extra-curricular training opportunities. For example, during my graduate studies at the University of Georgia (UGA), I helped in organizing a Conservation Medicine/Conservation Biology course for undergraduates at UGA Costa Rica. Most attendees were pre-vet, pre-med, or underclassmen interested in Ecohealth or a wildlife-conservation experience. Our laboratory also received applications for short-term training breaks from young veterinary or pre-veterinary students interested in gaining hands-on training in wildlife ecology and health issues, who received unique opportunities to work with projects conducted by graduate students. In addition, some U.S.-based academic institutions are offering experiential learning—or research track—oriented degrees, which provide opportunities for underclassmen in intensive and progressive training across multiple semesters under the supervision of faculty. Many

of these programs also facilitate research at collaborative institutions or in the field, preparing students for graduate training in ways that textbook-based learning cannot.

For post-degree practitioners, participation in activities related to local and global conservation can allow for the mastery of necessary skills and the development of working and teaching abilities to communicate current issues to stakeholders associated with epidemiological “hot spots.” Continuing professional education, such as participation in national and international conferences, seminars, and congresses, can provide practitioners with constant improvement in areas such as conservation education, conservation psychology, conservation economics, and phylogeography.

Theoretical and practical training provides students with the foundations to tackle emerging Ecohealth problems, yet we will never be too prepared—and possibly not even ready—for the next conservation challenge. Nevertheless, after years of disease investigation, we have increased our understanding of some of the main drivers of infectious disease emergence, such as globalization, international wildlife trade, and destruction of ecosystems and natural barriers. “Thinking globally and acting locally” is a growing trend in the modern world, and in a similar vein, the One-Health approach must continue to integrate knowledge across disciplines to address future problems facing human, domestic animal, and wildlife health.

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The biosphere is threatened by several pervasive and synergistic phenomena that are the result of increasing human pressures on the planet: climate change, biological impoverishment, pathogen pollution, and global toxification. These factors are working in concert to diminish human, domestic animal, wildlife, and environmental health. By including Conservation Medicine, EcoHealth, or One Health into undergraduate curricula worldwide, we can train the next generation that will create new paradigms and be able to form transdisciplinary teams to change current environmental trends.

The strategies of Conservation Medicine/EcoHealth/One Health include long-term monitoring, health assessment, and interventions to protect species, ecosystems, and humans at risk. We particularly must minimize the threat of any potentially catastrophic disease outbreaks resulting from the human ecological footprint. Conservation of biodiversity and ecological health are best achieved through outstanding applied science and community-based activities designed by local professionals. We are convinced that the most effective EcoHealth/One Health solutions are those that are locally relevant. Developing practical, sustainable and effective solutions requires a sound understanding of the bridges between ecology and health and a solid grasp of complex national and regional health and environmental policies that can be distilled through undergraduate education. We are grappling with finding solutions for today’s most compelling challenges: conserving fragmented ecosystems; addressing threats to biodiversity from climate change; new technologies to save individuals from collapsed species now numbering in the hundreds or thousands; and understanding emerging infectious diseases and ecosystem health.

As stated in the essay, “thinking globally and acting locally” is a growing trend in the modern world, but the opposite—“thinking locally and acting globally”—represents the need for global capacity in undergraduate training in EcoHealth/One Health. We require research networks and communities of practice capable of breaking down institutional barriers and building collaborative bridges, so that the next generation of ecological caregivers will be critical to reverse current trends. Consistent with this philosophy, we need to strive to ensure lasting local conservation impacts with global health solutions with every project by training community leaders, volunteers, school children, and undergraduates. These groups comprise the next generation of EcoHealth/One Health scientists.

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