

News from the IAEH

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NEWS FROM THE STUDENT SECTION: THE IMPORTANCE OF SOCIO-ECOLOGICAL CONTEXT IN ECOHEALTH INITIATIVES

The context-dependent nature of infectious disease outcomes advocates considering ecological determinants and hence, when the host is human, the incorporation of human ecology, a social science. The importance of integrating social considerations into ecological studies of infectious diseases is essential for research on sustainable disease control. Taking into account the complex interactions from genes to communities across spatial and temporal scales is a fundamental necessity; however, practical implementation remains limited because transdisciplinary research that integrates knowledge from different unrelated disciplines (e.g. social science and ecology) and non-academic knowledge sources is rarely achieved.

Increasingly, graduate programs acknowledge the need for integrative investigations of infectious diseases. Many emphasize the multidisciplinary nature of their curriculum where clinical, population, laboratory, and social sciences can be integrated. Yet despite these good intentions, the Ecohealth agenda is impeded by conceptual compartmentalization and the limited dialog among social, natural, biomedical, and public health sciences personnel. The lack of a cohesive conceptual framework that links discipline-specific processes is often at the origin of this limitation. To rectify this historic trend and restore scholarly breadth of original university science, future or evolving graduate programs should consider incorporating in their curriculum a certain number of mandatory courses such as philosophy and history of science or ethics in science.

Additionally, graduate programs may want to organize advanced workshops focusing on the concept of multiple working hypotheses and how to implement multi-scale causal inference in disease research. With a deepened philosophical background, students in health sciences should be able to establish solid foundations for critical thinking and intellectual openness and become the scientific leaders that will reconcile holistic and reductionist approaches in health sciences.

Transdisciplinarity and the proper incorporation of social determinants also implies that institutions and individuals become immersed in the local culture for more than their sampling season, especially when research is conducted abroad. Researchers should also aim to involve themselves in the daily life of local communities, enabling individuals to better understand social networks and how they impact disease outcomes. Investigators should also be open to “intellectual out-breeding” and receptive to local wisdom. Finally, although pressure to publish is strong, researchers must not forget the true finality of their work: helping the community. These elements are rarely taught or even suggested in graduate programs because they are emerging ethical values often contingent on one’s life experience and exposure to real situations. Yet this ethical perspective is critical to better understand the socio-ecological determinants of disease dynamics. In practice, the support and organization of educational interventions describing the research-to-practice-to-community continuum (targeting both researchers and local stakeholders) are critical to make ethical principles operational.

I recently took a post-doctoral position with the Tropical Disease Research Laboratory (TDR), a unit associated with the Faculty of Medicine, Khon Kaen University (KKU) in northeastern Thailand. The research focus of TDR is on *Opisthorchis viverrini* (OV), a liver fluke that

infects millions of people in southeastern Asia. The life cycle of OV, involving several native snail and fish species as intermediate hosts—with humans as the definitive host—is closely intertwined with thousands of years of rice–fish culture in this region. Over a period of nearly 30 years, KKU has established an international reputation through its numerous investigations of the parasitology, pathology, and immunopathology of diseases such as cholangiocarcinoma, a liver cancer associated with OV.

Despite years of top–down control campaigns, OV is still endemic to north and northeastern Thailand, Lao PDR, and Cambodia. Currently, there is no detailed understanding of the transmission dynamics of the parasite and, consequently, sustainable control remains elusive. Why does the research community struggle to understand OV transmission dynamics and forecast outbreaks of infection? The answer to this question is complex indeed. At the root of the problem are the tenacious remnants of a pathogenic paradigm that focuses on understanding health from the perspective of disease and not necessarily focusing on what makes people healthy. As a consequence, it is impossible to understand the fundamental nature of the human–OV relationship on one hand and the overarching importance of behavioral, environmental, psychological, and social factors that affect people’s health on the other. Interestingly, the occurrence of helminthes infections in human populations has been a powerful evolutionary force in shaping not only how immunity is initiated and maintained, but also how the body self-regulates and controls immune responses. In the case of OV as for other helminthes, millennia of coevolution have led to finely adjusted co-adaptations resulting in a relatively low virulence. Indeed, if the vast majority of patients infected by OV were actually benefiting from being infected, why should we try to eradicate a possibly beneficial symbiont? On the other hand, all infections represent an energy cost to afflicted individuals and helminths cause disease in hundreds of millions of people, although a significant portion of individuals are asymptomatic. So one must balance the risks associated with eradication with the possible benefits of minor infection.

Eradication campaigns often relying on drastic changes in community behavior may contribute to an already rapid movement to urbanization by rural communities. Ultimately, the de-agrarianization of northeast Thailand communities and un-contextualized parasite eradication campaigns may lead to the disconnection of rural people from their traditional habits and land, further contributing

to the loss of cultural identity. Transition from rural to urban environments may imply switching from raw fish to processed food; however, this transition may mean switching from liver fluke infection to urban maladies such as diabetes and cardiovascular diseases, and from low stress to psychological and emotional disorders. For these reasons, questions of benefit and cost need to be carefully addressed and thus research agendas need to be contextualized in a broader framework.

I have spent 6 months associated with local communities in northeastern Thailand, and every day I learn more about the socio-cultural context in which my research is imbedded. I objectively try to make sense of what I observe and relate it to my “narrower” research and realize that these questions are not only about liver fluke infection, but ultimately about ecosystems and human health. In order to realize the mindset shift that needs to occur, it is critical to contextualize research questions to real life solutions, ultimately fulfilling sciences original objectives and providing society with long-lasting solutions. To do so, transdisciplinarity is the key and proper implementation implies cultural immersion, open-mindedness, critical thinking, and integrity.

“Health is the extent to which an individual or group is able, on the one hand, to realize aspirations and satisfy needs, and on the other hand, to change or cope with the environment. Health is therefore seen as a resource for everyday life, not the objective of living; it is a positive concept emphasizing social and personal resources, as well as physical capacity.” World Health Organization. 1984. The Ottawa Charter for Health Promotion. World Health Organization Regional Publication for Europe Serial 44, 1–7.

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PROFESSIONAL RESPONSES

Integrating Traditional Knowledge, Ecological Practice, and Evolutionary Theory

As an ecologist who has over 30 years of experience working in a diversity of environs including the Canadian Arctic, the Boreal and Eastern Deciduous Forests, the Tropical Forests of

Mexico, and more recently the Wetlands of Thailand, I have developed a great respect for traditional knowledge and local customs that have evolved over generations of trial and error and experimentation in the communities in which I have had the pleasure to work. As one of my Inuit colleagues stated, “The white men have all the answers, but the natives know what they are doing”. Unfortunately, the truth in this statement is very real, as many researchers disregard the customs and local knowledge of the people where they work and make little effort to appreciate the traditions, language, and knowledge of the individuals present. The folly in this is that these traditions and ways of doing things have evolved for specific reasons and have real value for the individuals and communities that utilize them; disregarding them often makes research conclusions redundant or even detrimental if implemented.

Historically, most human infectious diseases evolved from pathogens of wild animals that were domesticated (i.e., 60 from the dog). More recently, globalization, habitat fragmentation, game farms, the pet trade, zoological gardens, and the mass movement of people have elevated human-wildlife contact and the risk that wildlife pathogens will evolve mutations that allow them to infect humans. Thus the need to integrate social norms, traditional knowledge, ecological understanding, and evolutionary theory is even more pressing if we are going to be successful at preventing pandemics in a world approaching nine billion people.

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Navigating the Academic and Real World Divide

The author’s description of the challenge sustainable control of opisthorchiasis presents correctly highlights the conceptual and practical problems posed by the dichotomy of disease and health, as well as that of academic and community agendas. The high incidence of cholangiocarcinoma, a commonly fatal disease for tens of thousands each year in the Lower Mekong Basin, is nonetheless a reality. Although “associated” with OV infection, cholangiocarcinoma (CCA) etiology undoubtedly is complex. Indeed, other factors associated with changing livelihoods and lifestyles from traditional to modern could be found ultimately to be causally significant.

The situation poses an apparently ideal yet a extremely challenging opportunity to test transdisciplinary, ecosys-

tem-based approaches to disease prevention and control. The parasite’s life cycle, the tradition of eating raw and fermented fish dishes, and fecal deposition in rice fields are deeply embedded in the culture here. Intervention planning and implementation clearly require total community participation, along with representatives of other stakeholders such as those from the education and health sectors. This would seem an ideal Ecohealth opportunity. Yet taking advantage of it requires overcoming numerous obstacles, often administrative or bureaucratic in nature, to interdisciplinary collaboration and community participatory research and action. For example, the extraordinary effort required to recruit collaborators from multiple disciplines and facilitate interdisciplinary exchange is rarely rewarded in a university. True community participatory research (“action research”) requires a depth and continuity of community engagement that is extremely difficult within the scope or budget of a single grant. Moreover, project funders generally require progress reports, including fiscal expenditures, on fixed time schedules. Yet, truly productive and meaningful community engagement requires deference to a community’s own schedule and priorities.

The transdisciplinary mindset and research philosophy required is clearly academically non-conventional, requiring both the perspective and level of commitment expressed by the author above. A new generation of such leaders is needed to navigate between the academic culture and real-world challenges such as that posed by the persistence of liver fluke and relatively high incidence of CCA. This is a challenge not only for the Lower Mekong Region, but also for Eastern Europe, Russia, and China, where roughly 600 million people living where liver flukes remain endemic are potentially affected.

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Globalization, an Overarching “Ecological” Health Determinant

Over 30 years, I have moved academically from clinical and community psychology to health promotion/health policy and public health, with a four-year stint in an environmental science/climate change research Centre for leavening. I now consider myself a social scientist in public health committed to inter, or (less often achieved) transdisciplinarity, multiple methodologies, cross-sector collaborations, and respectful research and practice partnerships with communities. The complexity of the dynamic interactions between a broad range of social, economic, educational, cultural, physical, and biological environmental factors and population health are obvious, as are (or should be) the inadequacies of trying to understand and alter these by focusing on linear relationships between disease and proximal static risk-factors. To face this complexity requires physical and medical sciences to work with social and behavioral sciences to share their conceptual and theoretical viewpoints and develop robust methodologies for addressing health problems. The positivistic “rationality” of science must combine with the subjective and multiple “truths” encountered in working with a wide variety of community values and social practices.

I’m therefore very heartened with this essay’s synergies with many broad social health determinants traditions in public health. Rudolf Virchow in the mid/late 1800s was an obvious giant in this regard, along with Chadwick’s work in the 1840s, Henry Sigerist in the 1940s, Hafdan Mahler in

the 1970/80s, the 1978 Alma Ata Declaration, and contemporary “critical public health and health development” orientations. The Charter of the People’s Health Movement, a global coalition of health activists and academics, provides the most comprehensive current integration of social and environmental determinants for health with its dedication to “health equity, ecologically sustainable development, and health as a human right.”

I strongly endorse the author’s suggestion of capstone integrative courses in graduate programs, particularly interdisciplinary programs to challenge students to think beyond their “home” disciplines. In addition to covering social and environmental determinants and complex causality models, in my view, these programs should also include modern trade and finance globalization processes and human rights. The neo-liberal narrative of modern globalization privileges wealth creation and profit maximization over protection of the physical environment/biodiversity and a raft of land, community, and human rights. This values-based power dynamic is a “mega” health determinant that cannot be sidelined as we study other contextual “ecological” variables that also impact on health and human well-being.

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