

## *In This Issue*

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### OCEANIA SPECIAL FEATURE

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**Kingsley and Thomas** begin this Oceania Special Feature with a forum that explores how to best integrate ecological and human concerns within governance structures. Their article highlights challenges to wellbeing discourse in research and policy frameworks and presents a case study from Australia that demonstrates complex social-ecological health problems in the region. They advocate for the need to reshape governance institutions to better engage with complex social-ecological health problems and to highlight that Australia offers an international relevant case study to address this task. **Patrick and Dietrich** follow with a short communication that presents findings of a qualitative study of global health and sustainability thinkers, ideas and principles for action on human and ecosystem health. Focusing on challenges in the Oceania region, the paper contrasts the principles identified in the study with the six principles for EcoHealth (systems thinking, transdisciplinarity, participation, sustainability, equity and knowledge-to-action), taking into consideration the implications for EcoHealth practitioners working in Oceania. **Arabena and Kingsley's** forum article explores the importance of Oceania in informing ecosystem approaches to health research and practice. The article outlines the formation of the Oceania EcoHealth Chapter and the importance of diverse Indigenous and ecological knowledge and the environmental challenges of the region.

Proceeding the short communication and forum pieces, three larger original contributions follow providing more in-depth place-based examples from the Oceania region. These original contributions start off with **Henwood et al.** who assert that Maori environmental values were marginalised by colonisation in Aotearoa (New Zealand), damaging indigenous economies, ecosystems, and sustainability. Treaty settlements have seen water and other resources re-

turned to iwi often in a degraded state, surrounded by anxieties about what the return to indigenous ownership will mean for longstanding non-Maori stakeholders. At Tāngonge, a drained floodplain lake near Kaitaia in Northland, environmental restoration aspirations from Maori have brought together technical knowledge of hydrology with local Maori knowledge as a strategic step toward working with territorial authorities to sustainably manage the resource. **Jenkins et al.** follows the preceding article regarding sustainably managing water with their own findings of Typhoid in Fiji. This study explores relationships between environmental conditions of sub-catchments and incidence and recurrence of typhoid fever in Central Division, Republic of Fiji. Using quantitative spatial analysis, **Jenkins et al.** indicate that anthropogenic alteration of land cover and hydrology through fragmentation of riparian forest and increased connectivity between road and river networks facilitates increased transmission of typhoid. This study suggests that particular settings where sediment yields increase following runoff, can act as sites of carriage, potentially predisposing the likelihood of exposure, and therefore typhoid fever infection and disease. **Lal et al.** wrap up this Special Feature with their study on the public health impacts of livestock intensification. This ecological analysis found that the risk of reported cryptosporidiosis among children under 5 years old is highest for those living on or in proximity to intensively stocked dairy cattle farms.

### THE BEGINNINGS OF HIV IN AFRICA

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The “cut hunter,” the purported index patient of pandemic HIV-1 M, is an explanation for the first sustained cross-species transmission of a simian immunodeficiency virus from nonhuman primates (NHPs) into a human being.

**Rupp et al.** argue that it relies, however, on historical misunderstanding and ecological oversimplification of human-chimpanzee interactions that facilitated pathogenic transmission. This study, based on 62 oral historical interviews in southeastern Cameroon, archival research, and participant-observation, reveals this explanation's inadequacies and shows that HIV emerged from ecological, economic, socio-political transformations of the late nineteenth and twentieth centuries. The most important changes facilitating the host shift and adaptation to human-to-human transmission occurred after 1920.

## H<sub>2</sub> PROTOZOA

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Monitoring the microbiological quality of water is an essential tool for human health protection and aquatic systems conservation. The reuse of wastewater is not a new practice, but it has been increasing without planning or caution. In Mexico, the Mezquital Valley receives untreated wastewater from the metropolitan area of Mexico City and is reused for irrigation while accidentally recharging the aquifers. **Fonseca-Salazar et al.** analyzed bacteria and pathogenic protozoa from these water sources, and provided a current diagnosis of water quality, demonstrating the transition of the need to treat wastewater from a local to a regional vision.

## THE ECOHEALTH CALENDAR

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In this paper, **Santo Domingo et al.** present the EcoHealth Calendar as an innovative and participatory tool in the EcoHealth approach. The instrument contains information, based on local knowledge, of the annual behavior of eco-bio-social factors related to health through a year, allowing us to understand the annual cycle of socio-ecological dynamics and its relation to health. The EcoHealth calendars were created with two indigenous communities of Colombia, with whom we were able to identify key moments of the year when the transmission of vector-borne disease increases hence this calendar could be a suitable tool to develop community-based interventions.

## ATLANTIC AMERICAS FLUWAY

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Avian Influenza viruses (AIV) are widely recognized as one of the most significant pathogens worldwide for humans, domestic animals and wildlife. Despite being one of the

most studied pathogens worldwide, there are few studies on the epidemiology of AIV in wild birds in South America. In this study, **Hurtado et al.** examines the largest sample size of aquatic birds examined to date in Brazil ( $n = 1006$ ), employing best-available laboratory methods to investigate the occurrence of AIV in aquatic birds at a stop-over site on the Brazilian Amazon coast, along the Atlantic Americas Flyway.

## INVASIVE WORMS IN UGANDA

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To improve the understanding of the impacts of anthropogenic disturbance on host-parasite interactions, **Salzer et al.** investigated trypanosomes infecting rodents in western Uganda. They screened 348 individuals, representing 26 species, from forested and non-forested habitats and found 18 % positive for trypanosomes. *Trypanosoma lewisi* was found in seven species both native and invasive, while *T. varani* was identified in only three native forest species. Their findings provide evidence that anthropogenic disturbance may lead to spillover of an invasive parasite from non-native to native species, and lead to local co-extinction of a native parasite and native forest-dwelling hosts.

## MIGRATING WILDEBEEST

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**Mijele et al.**'s findings compared to those of previous studies suggest that migration may provide a mechanism to minimize exposure of hosts to common parasites through migratory escape, but this result awaits examination of helminths epidemiology of non-migratory wildebeest from areas of migrant origins. The potential parasitic cross-infection between wildebeest and livestock is a real risk to be taken into account in the management of wildebeest migration corridors.

## ALTERNATIVE NIPAH TRANSMITTERS

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Human Nipah encephalitis outbreaks have been identified almost yearly in Bangladesh since 2001. Prior studies identified raw date palm sap consumption and person-to-person contact as major transmission pathways, yet alternative pathways of transmission are plausible and may not have been identified due to limited statistical power in each outbreak. **Hedge et al.** conducted a risk factor analysis

using all cases and controls surveyed in previous outbreak investigations to identify these rare exposures. Through their analysis, both quantitative and qualitative, they found more definitive answers for how Nipah transmission occurs, how prevention efforts should be focused, and methodological considerations for how outbreak investigations of rare diseases should be conducted.

## LEAD US AWAY FROM LEAD

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**Arnemo et al.** assert the deleterious effects of ingested lead from spent hunting ammunition on wildlife and human health are well-established in the hundreds of peer-reviewed scientific papers published on this topic. Their number has increased rapidly in the last decade, especially those documenting health concerns posed by lead in hunted game meats. There has been little international progress in replacing lead ammunition with effective, non-toxic, substitutes. This One Health concern for human and environmental health from ingested lead has progressed from a purely scientific issue to become a major socio-political issue deserving immediate international attention.

## RIFT VALLEY FEVER VIRUS CONTROL

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**Kimani et al.** modeled a ten-year cost-effectiveness analysis of livestock Rift Valley fever control from a public health perspective in Kenya for the 2006/2007 epidemic and a hypothetical one in 2014/2015. Four integrated strategies were compared- baseline vaccination of 1.2–11 % animals; two alternatives that assumed improved vaccination coverage; and enhanced surveillance with baseline vaccination. Best models showed a public health burden from the 2006/2007 RVF epidemic of 3974 disability adjusted life years (DALYs). Improving vaccination coverage before the hypothetical outbreak averted close to 1200 DALYs and was cost-effective. Baseline vaccination was not cost-effective.

## KIDS IN THE AMAZON

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**Delfino et al.** describe an 8 yearlong study that investigates the prevalence of intestinal parasitosis, focusing on *Giardia lamblia* and helminthes in children and its associated factors. They also evaluate socioeconomic and environmental changes and their relation to spatiotemporal distribution of

these diseases, focusing on the effects these changes caused for the health of Amazonian children in Assis, Brazil.

## VAMPIRE BATS

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Certain bat species serve as natural reservoirs for pathogens of human public health concern. The Common Vampire Bat (*Desmodus rotundus*) may have an unusually high potential for interspecies disease transmission due to its abundance, feeding habits, and proximity to humans and their livestock. **Wray et al.** screened non-lethal bat tissue samples for 15 viral and bacterial families and genera, and also analyzed cytochrome B sequences from fecal samples to identify prey species. Their findings suggest that the risk of microbe sharing between *Desmodus rotundus* and its prey warrants further investigation of microbial diversity and foraging ecology in their populations.

## XENOPUS LAEVIS ALONE!

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Invasive species have been proposed to be involved in the introduction and spread of many important diseases. The African clawed frog (*Xenopus laevis*) is one of the most widely distributed invasive amphibians. **Soto-Ataz et al.** assessed the Ranavirus and *Batrachochytrium dendrobatidis* carrier status of invasive *X. laevis* in central Chile. Evidence of both pathogens infecting *X. laevis* in the absence of clinical disease was found. This is the first report of Ranavirus in Chile and these preliminary results are consistent with a role for *X. laevis* as an infection reservoir for both emerging diseases.

## HG IN CAN

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In the heart of Canada's "Chemical Valley" lies the Aamjiwnaang First Nations. While the region has been plagued with mercury pollution for decades, few studies have been performed. At the request of the community here **Cryderman et al.** characterized mercury in the environment (air, soil, sediment) and residents (blood, urine). In general, the study links evidence of mercury sources, environmental fate, and human exposures, and in doing so it shows that mercury levels in ecological and human samples are similar to values found in other areas, though there are some trends and evidence of contamination at Aamjiwnaang that warrant attention.

## WEST NILE VIRUS IN ROMANIA

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**Cotar et al.** collected mosquitoes in the Danube Delta of Romania from 2011 to 2013, testing *Culex* mosquitoes for the presence of the WNV genome, establishing the maximum likelihood of the infection rate. Positive temperature anomalies in Spring and Summer, and rainfall decrease contributed to mosquito population increase and accelerated the transmission of WNV in the mosquito-bird cycles, leading to increased WNV infection rates in mosquito vectors in the following weeks.

## BD IN EUROPE AND THE AMERICAS

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*Batrachochytrium salamandrivorans* (Bsal) is a virulent fungal pathogen that infects salamanders. *Batrachochytrium dendrobatidis* (Bd), is the agent responsible for anuran extinctions and extirpations worldwide, and both are considered to be global threats to biodiversity. **Parrott et al.** screened specimens of salamanders representing 17 species inhabiting mountain ranges in three continents: The Smoky Mountains, the Swiss Alps, and the Peruvian Andes. They found that *Bsal* was not detected and *Bd* was mostly absent except for one site in the Andes.