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In This Issue

EIDs in Wildlife Populations

In a manuscript by **Voyles *et al.***, the group describes the need for international infrastructure to facilitate rapid responses for emerging infectious diseases (EIDs) in wildlife. This paper outlines how the internationally coordinated networks that are already available (e.g. to address EIDs in human, livestock and agricultural crop systems) would provide rapid and data-driven response systems critical for successful intervention during disease outbreaks in wildlife. The study distils the key aspects needed in a proposed international institutional system and describes how addressing EIDs in wild populations will safeguard against species extinction, protect public health and ensure ecosystem functioning.

In an article by **Hyatt *et al.***, a trans-disciplinary, one-health approach is proposed for the coordination of wildlife health diagnostics, research and policy development. In some countries, considerable effort has been made to establish specific activities including surveillance and integration of wildlife health within diagnostic and research laboratories. This manuscript suggests that scientists in this field should actively engage with the national and internal organisations and conferences to influence the development of policy, diagnostics, research and management of emerging wildlife diseases.

The Host with the Most

Chytridiomycosis, an emerging disease caused by the fungal pathogen *Batrachochytrium dendrobatidis* (*Bd*), has devastated global amphibian biodiversity, yet some species do not manifest clinical disease when infected with *Bd*. **Eskew *et al.*** report on experimental exposures of a generally non-susceptible amphibian host species, the American bullfrog, with multiple isolates of *Bd*, including one that was implicated in causing an unusual mortality event of wild bullfrogs. It was found that low infection prevalence and load with all isolates, indicating American bullfrogs, both resist and tolerate *Bd* infection and suggest that wild disease outbreaks in this species may be driven by environmental cofactors.

Rural Mental Health Ecology

A paper by **Wilson *et al.*** argues that the use of rural mental health social ecology framework is an appropriate way to respond to the mental health problems of rural people. It explores ways in which social capital can assist in the understanding of how mental health helping capital can be generated and promoted within communities to improve rural mental health ecosystems.

Hantavirus in Argentina

Rodents are reservoirs of many zoonoses, and the horizontal transmission among them is related with their movements. In a natural protected area of Buenos Aires, Argentina, two hantavirus reservoir species were found: *Oligoryzomys flavescens* and *Akodon azarae*. Hantavirus antibodies were detected in 20% of *A. azarae* individuals. This species has not been associated yet with human disease; however, based on the fact that *A. azarae* has generalist habits, and that it shares paths with the rest of the species, **Maroli *et al.*** propose that this rodent could play an important role as a link among species and could promote the spillover of hantavirus.

Avian Malaria in New Zealand

Gudex-Cross *et al.* compared mosquito abundance and species composition at two forest edge sites abutting pastureland with two forest interior sites in New Zealand, while also assessing avian malaria prevalence in silvereyes (*Zosterops lateralis*). The findings suggest that avian malaria prevalence in silvereyes appears to be unaffected by forest fragmentation, at least at the scale assessed. The near-absence of introduced mosquito species from the forest interior provides further circumstantial evidence that native mosquito species play an important role in avian malaria transmission in New Zealand.

Adenovirus in Rural Côte D'ivoire

The role of animals as pathogen reservoirs or intermediate hosts is underestimated in regions with overlapping human and animal habitats. A paper by **Pauly *et al.*** shows that In rural Côte d'Ivoire, strong evidence for cross-species transmission of the mainly host-specific and environmentally stable adenoviruses between different animal species was obtained, and the indications for adenovirus transmission from humans to animals were revealed. Even if the pathogenicity of adenoviruses is limited, these widespread viruses represent valuable sentinels to assess the risk for cross-species transmission of more pathogenic viruses in recognized hotspots for disease emergence.

Brucellosis on a Farm E-I-E-I-O

Brucellosis, a zoonotic disease of livestock, is a considerable public health and economic burden in many areas of the world including former USSR countries. **Beauvais *et al*.** analysed policies in relation to brucellosis in Kazakhstan, a former USSR country, and found that high livestock densities on farms may have played a key role. However, the lack of reliable estimates of brucellosis prevalence and difficulties in understanding exactly how policy is being applied in Kazakhstan, prevent firm conclusions from being drawn. The brucellosis control programme needs to be adapted to the current smallholder-predominant system.

Heavy Metal Hair

A study by **Betancourt *et al.*** sought to identify neurobehavioral disorders in children exposed to toxic metal pollution from gold mining in the Puyango River Basin, Southern Ecuador by applying a neurobehavioral test battery. It was found that children with elevated levels of hair manganese had poor performance in the test of general intelligence. It was possible to identify that children in the lower Puyango Basin with very elevated levels of manganese in the river water are the ones who have the highest levels of hair manganese and the worst performance in the intelligence test.

Dams in Sub-Saharan Africa

This paper reviews the impact of dams on malaria across the sub-Saharan Africa. While dams are economically important infrastructures, the potential impact of dams on malaria needs special attention while planning, implementing and operating dams. This paper by **Kibret *et al.*** found that dams increase malaria in semi-arid areas, where malaria transmission is seasonal. Proper dam management is crucial to reduce the negative impacts of dams on malaria in sub-Saharan Africa.

Through the Fire

Human suppression of fire in the fire-prone ecosystems has triggered broad ecosystem changes that have altered the risk and transmission of infectious disease pathogens and host parasite dynamics. Empirical research and observational studies indicate that restoring fire in natural areas has the potential to reduce ecto-parasites without wings such as ticks, chiggers, fleas and lice; ecto-parasites with wings such as mosquitos, horn flies, face flies and stable flies; and endo-parasites affecting livestock and wildlife. This research by **John Scasta** suggests that fire ecology and parasitology are considered as a priority area for future research.

Unbearable Infectious Agents

This manuscript by **Fagre *et al.*** summarizes infectious agents and associated disease, if known, in polar bears. Overall, the majority of reports in free-ranging bears include little to no information on health effects, while most reports documenting illness or pathology referenced captive animals and diseases caused by agents not representative of exposure opportunities in wild bears. As such, most of the available infectious disease literature has limited utility as a basis for development of future health and management plans. Future

research should focus on cumulative effects and an attempt to integrate infectious disease research with other aspects of polar bear health and vital rates.

Central Bohemia with a Twist of Lyme

Zeman *et al.* analysed historical data on *Lyme borreliosis* emergence in Central Bohemia between 1987 and 2010. It revealed that a rate of peri-domestic exposure, the proximity of patients' residences to high-risk habitats and the number of disease cases has been interdependent variables, and that their common upturn can be dated back to the start of the disease notification. The data indicate that the disease's rise is attributable to the translocation of part of the at-risk population nearer to natural environments, rather than to mere intensification of people's peri-domestic exposure at existing residential locations, or changes in the natural environments themselves.

Bluetongue in Europe

In 2006, Bluetongue serotype-8 entered northern Europe with devastating effects on livestock. **Sedda *et al*.** describe zoological and environmental differences between farms that are implicated in subsequent farm infection and those infected farms. These findings help in the description and quantification of relative risk in Bluetongue's affected areas.

The Long Road to Rodent Infestation

Commensal rodents are pests in urban areas, and knowledge about factors that favour them at large scales is poor. **Cavia *et al.*** studied spatial and temporal variations in rodent infestation levels at the whole city scale. Areas with high density of apartments and the limited availability of open spaces resulted in lower infestation levels, while higher levels were observed in areas with more precarious socio-economic conditions and in industrial areas. Rodent control programmes would have better results if efforts are focused on areas with more precarious conditions and industrial areas in the cold season.

Aquaculture in Vietnam

Vietnam has very little enforced regulation pertaining to antibiotic usage in domestic aquaculture, which raises concerns for antibiotic resistance in pathogenic bacteria. In this study, **Pham *et al.*** conducted an analysis on the presence of antibiotic residues in domestically sold fish and shrimp raised in freshwater farms in Vietnam, and an assessment of farmers' knowledge of proper antibiotics usage was performed. The results indicate that a quarter of tested aquaculture products were antibiotic screen test positive, and there is a general lack of knowledge of the purpose and proper usage of antibiotics.

Rickettsia felis in Mexico

Rickettsia felis is the causative agent of the flea-borne spotted fever, an emerging zoonosis in several parts of the world. The aim of this study by **Panti-May *et al.*** was to provide information of the occurrence of *R. felis* in wild mammals from three municipalities in Yucatan, Mexico. Reactivity of rodent serum to *Rickettsia* antigens was detected in 80.9% samples, and the polymerase chain reaction identified rickettsial DNA in spleens of 43.5% rodents and 57.1% opossums.

Blood, Hair and Seals

Total mercury concentration ([THg]) was measured in hair and blood of wild-stranded harbour seal pups undergoing rehabilitation to determine potential associations between in utero exposure and adverse neurological outcomes. **Van Hoomissen *et al.*** determined a positive association for increasing blood [THg] and the presence of neurological outcomes; no other associations were determined. [THg] in blood and hair exceeded numerous threshold values suggestive of adverse neurological outcomes in humans and wildlife. The lack of association between hair [THg] and neurological outcomes indicates the relationship is complicated, and highlights the need for continued research efforts to better evaluate health effects due to mercury exposures in wildlife.

Tortoise Genes

The influence of human disturbance on health and survival of desert tortoises (*Gopherus agassizii*) is difficult to detect. As an addition to current diagnostic methods for desert tortoises, **Bowen *et al*.** have developed the first gene transcription biomarker panel for the desert tortoise. The gene

panel included a combination of genes with the potential to be modified by biological or physical injury and consequently provide information on the type and magnitude of stressors present in the animal's habitat. Blood from 64 wild adult tortoises and 19 captive tortoises was collected and evaluated for genes indicative of physiological health.