EcoHealth
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In This Issue

Special Feature: One Health

Reporting of demographic data is very lacking in Africa. This applies particularly to mobile pastoralists in the Sahelian countries. Mobile pastoralists in Chad and other countries of the Sahelian belt in Africa are excluded from health services and their health status is almost unknown. So far, no methods exist for demographic surveillance of mobile populations. Information on fertility and mortality is essential for the planning of public health and social development. **Weibel et al.** present a method using electronic fingerprint registration, which was applied in a random transect field study on the southeastern shore of lake Chad. Demographic surveillance of such communities can also be extended to their livestock providing more accurate information on their ecological footprint.

In addition to health, malnutrition plays an increasingly important role for the health status and may jeopardize beneficial effects of health interventions. It is therefore important to better understand the level of malnutrition and its interactions with health status. In two studies in this issue, **Bechir et al.** present cross-sectional research that document the micronutrient deficiencies in mobile pastoralists in Chad and assess a spectrum of parasitic infection and level of anemia as well as their effect on nutritional status in settled and mobile pastoral mothers and children near Lake Chad. The authors found that nomadic groups had close to normal levels of retinol, but could be considered moderately deficient. Malnutrition was significantly associated with anemia in mothers and with selected intestinal parasites, anemia, and age in their children.

Bonfoh et al. conducted a cross-sectional study on brucellosis in humans, cattle, sheep, and goats in Kyrgyzstan. The authors aimed to assess the apparent seroprevalence in humans and animals. The overall apparent seroprevalences of brucellosis were 8.8% in humans, 2.8% in cattle, 3.3% in sheep, and 2.5% in goats. Although human seroprevalence was not significantly associated with cattle seroprevalence, it turned out to be significantly associated with small ruminant seroprevalence. These results indicate an under-reporting of human brucellosis cases and suggest that the role of small ruminants should be further investigated. The authors recommend the mass vaccination of sheep, goats, and cattle as a method of rapid intervention to bring down the annual incidence of human cases of brucellosis.

The occurrence of human tuberculosis (TB) cases and their main causative strains in remote pastoral zones of Ethiopia are hardly known. Since people in these zones live in close contact to their livestock, a proportion of human TB cases could be due to infection with cattle strains (*Mycobacterium bovis*). **Gumi et al.** have sampled suspected tuberculous patients (sputum and fine-needle aspirates of swollen cervical lymph nodes) and cattle, sheep, and goats at slaughter in two pastoral areas of South-East Ethiopia. Specimens were cultured and cultures were differentiated with spoligotyping. Most human isolates (160 out of 173) were *Mycobacterium tuberculosis*, but three were *M. bovis*. Twenty-four *M. bovis* strains were isolated from cattle and one *M. tuberculosis* from a camel. Given that *M. bovis* was isolated in people and one strain was identical to a strain from cattle, this study strongly suggests that tuberculosis is transmitted between livestock and humans.

A paper by **Narrod et al.** provides a comprehensive framework for assessing the societal cost of zoonotic diseases across all involved sectors. It is composed of novel joint methods to assess zoonotic disease frequency in animals and humans simultaneously, economic tools to estimate societal cost of disease and a mathematical framework simulating animal–human disease transmission, which can

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be used for comparative cost-effectiveness studies of interventions.

Pigeon Pieces

Non-native species can disturb natural ecosystems by acting as reservoirs for disease. Eurasian collared doves are an invasive species in the United States and have expanded their geographic range across most of the country in the last thirty years. In a paper by **Schuler et al.**, the authors discuss the recent mortality outbreaks in Arizona and Montana identified as pigeon paramyxovirus type 1, which is related to Newcastle disease and can be pathogenic to poultry. This novel pathogen qualifies as an emerging infectious disease that has considerable potential to cause disease in free-ranging and domestic birds and highlights human activities promoting disease emergence.

Uncharted Ratios

Many species of fish have high mercury levels that can cause adverse health effects in top-level predators, including birds and people. Selenium protects against mercury toxicity, and it has been suggested that the selenium to mercury molar ratio should be used in risk assessment and risk management. **Burger et al.** provide these ratios for fish from places in Tennessee, USA and show that both the species and individual variation within species make it difficult to use molar ratios in risk assessment or management. Some species with mean ratios above 1, for example, have individual fish with lower ratios.

Rain Drain

Darwin, being in tropical northern Australia, is subject to mosquitoes and mosquito-borne diseases. After a period of housing expansion, many suburbs are in close proximity to swamps created by the storm-water run-off from nearby development. This has disrupted the natural wet-dry cycles and provides a year-round breeding habitat for mosquitoes. A study by **Jacups et al.** assesses the impact of drainage channels, constructed throughout the wetlands to reduce pooled water during dry-season months, on vegetation and mosquito ecology. Although a few mosquito species increased during wet-season months, the authors' findings show a universal decline in dry-season mosquito abundance. In addition, drainage has restored the areas closer to their original salt-marsh ecosystems.

Gull-able Beaches

Engeman et al. applied egg oiling to ring-billed gull nests to curb annual production and reduce the influx of hatch-year (HY) gulls to Chicago's beaches, where populations have increased substantially and is the cause of conflict and health issues with local human populations. Gull fecal contamination of water is one of the issues surrounding the explosive gull population. Egg oiling is the application of food grade corn oil to the gull eggs for the purpose of making them inviable. HY gull numbers at ten surveyed beaches showed significant decreases by weeks 7 or 8 of the swim season during years with $\sim$80% oiling. Gulls that were after hatch-year were not found to decrease and their usage of the beach remained the same. Compared to the pretreatment year, the beaches with improved water quality increased in number with each year of the study, suggesting that the resulting fewer gulls on the beaches was beneficial for the beach water quality.

SAD Sites in the Centennial State

Lehmer et al. examined how forest dieback regulates zoonotic disease prevalence specifically in the relationship between Sudden Aspen Decline (SAD) and Sin Nombre virus (SNV) as a model system in the San Juan National Forest in Colorado, USA. The authors' results show that forests with the greatest levels of aspen dieback had reduced canopy cover and understory vegetation cover, but greater understory biomass. These changes in vegetation structure likely resulted in shifts in small mammal community composition, as high SAD sites had reduced mammal biodiversity and higher deer mouse densities, the primary host for SNV. High SAD sites also had greater SNV prevalence, which is likely a result of the abundance of deer mice.