

In This Issue

In This Issue

SPECIAL FEATURE: HOUSEHOLD AIR POLLUTION

An ancient health hazard—smoke from household cooking—has risen to the forefront of global environmental health concerns over the past few years. Josh Rosenthal introduces this issue’s special feature by outlining the cook-stove replacement programs that are being introduced in the developing world and the challenges associated with the movement. In a paper by Still et al., the group tested fifteen stove designs for fuel efficiency and emissions in accordance with the ISO/IWA tiers of performance. Sambandam et al. present some of the first results from field evaluations of six widely marketed advanced combustion biomass cook-stoves in India, showing the exposure reductions achieved with these stoves may need to be significantly enhanced to produce discernable health benefits. Ruiz-Mercado and Masera analyzed the rationale for “stacking”, or using clean fuels and stoves in combination with traditional open fires, for its observed patterns and their critical implications for effective implementation of stoves and for realistically estimating its impacts. A paper by Northcross et al. aims to provide general direction monitoring household air pollution exposures, building on the discussion at an expert consultation on exposure assessment convened by the Global Alliance for Clean Cookstoves, the Centers for Disease Control and Prevention, and PATH in late 2012. Schilman et al. conducted a study in Michoacan, Mexico and showed that the actual use of an efficient wood-burning stove decreases the respiratory infection episode duration compared to the use of an open fire in children under five years old.

WATER QUALITY NEAR LAKE ERIE AND MEXICO CITY

Wetlands can provide valuable ecoservices that protect and improve water quality. However, they often host large populations of wildlife that may carry diseases. A study by Rea et al. indicates that the ability of a Lake Erie wetland to improve water quality outweighs the contribution from wildlife to contaminated water. Fecal indicator bacteria and nutrients were reduced to safer levels for direct human contact at an adjacent swimming beach. This study supports the idea that intact ecosystems can mitigate human health risks.

In a separate study by Espinosa-García et al., the group shows that the criteria for selecting drinking water at a university in Mexico City vary. The group studied university students’ and faculty’s perceptions with respect to drinking water quality and the reasons one chooses drinking water. They found that people are untrustworthy of the quality of drinking water distributed inside the university campus and more than 70% of the participants choose bottled water for drinking.

BUSHMEAT CONSUMPTION IN GHANA

Zoonotic pathogens, which can cross from animals into humans, pose increasing public health threats. Bats host an array of zoonotic pathogens, yet little research exists on how bats and humans interact or which people may be at risk. Since hunting and butchering bushmeat are common

sources of zoonotic transmission, Kamins et al. performed a survey study to identify the characteristics and perceptions of people involved in the bat bushmeat trade in Ghana. These data can inform disease and conservation management plans, drawing on social contexts and ensuring that local voices are heard within the larger effort to mitigate outbreaks.

TSK, TSK, TICKS

To assess the role of migratory songbirds in the spread of the tick and pathogen responsible for Lyme disease in the USA, Schneider et al. captured passerines in Illinois during fall 2012 and compared regions where tick populations were previously or not yet established. Ticks were removed from birds and blood samples were obtained from birds. Infestation of birds by ticks differed significantly by region, whereas pathogen infection did not. Thus, migratory birds may play a larger role in pathogen dispersal than previously realized.

Zöldi et al. studied the virus of tick-borne encephalitis, which survives in nature in a complex circle in ticks and rodents. The study was for four years with monthly sampling of ticks and rodents and found that virus prevalence was relatively low in both. The results show that infective points in the endemic area are small and continuously change unpredictably as infective ticks die or spread.

Robinson et al. report spatial and temporal trends in tick-borne diseases such as Lyme disease, human anaplasmosis, and babesiosis. Using spatial regression, they evaluated the impact of landscape and climate factors on the spread of Lyme disease, and projected changes to disease risk under varying climate change scenarios. Dramatic changes in future temperature regimes and forest communities predict rising risk of tick-borne disease.

Faria et al. studied Lyme borreliosis, the most common tick-borne emerging zoonosis in the northern hemisphere. They present the first detection of *Borrelia* DNA in wild boar serum from the Trás-os-Montes region in Portugal and find that the wild boar is a potential reservoir for the bacteria.

TEMPERATURE EFFECT ON HENDRA VIRUS

Hendra virus is a highly pathogenic zoonotic paramyxovirus affecting horses. Scanlan et al. develop a simulation

model (based on laboratory data) to estimate the impact of temperature on Hendra virus survival in the environment. The authors concluded that survival is greater in winter than in summer and at higher latitudes. Year-to-year variation in simulated survival is similar to the variation in survival between locations where incidents have occurred. The seasonal survival pattern mirrors the pattern of reported Hendra virus incidents. While many factors contribute to Hendra virus incidents, temperature effects on longevity of the virus in the environment may contribute to the pattern.

MORBIDITY AND MORTALITY REPORTING

Emerging and reemerging infectious zoonotic diseases pose a continuous threat to human and animal health worldwide. Early detection of these diseases is key to the prevention and control of pathogen spread. Bisson et al. show that over half of the 143 zoonotic pathogens that emerged in human populations between 1940 and 2004 cause extended morbidity or mortality in their animal hosts, yet very few were first detected in sick or dead animals at the time of emergence in humans. The authors propose that animal morbidity and mortality reporting provides a crucial component of an early warning system for zoonotic diseases.

MALARIA TRANSMISSION IN SOUTH AFRICA

The International Council on Pastoral Care and Counselling places 'very high confidence' on the effects of climate change on malaria transmission. The causal links between rainfall and temperature to malaria are known, but uncertainty lingers about long-run drivers at local and global scales. Using simple econometric techniques and spatio-temporal change, Komen et al. tested the long-run relative importance of meteorological variables as drivers of malaria transmission in Limpopo Province, South Africa. The authors concluded that long-term public health planning and collaboration in combating malaria should be part of the key functions of the public health systems.

WEST NILE VIRUS AND BIRDS

The role of communal aggregations of birds in the transmission ecology of avian arboviruses such as West Nile

virus (WNV) is poorly understood and studies have generated conflicting results. Komar et al. evaluated the spatial association of human WNV case residences from an outbreak near Phoenix, Arizona with the position of house sparrow and great-tailed grackle communal roost sites. Spatial associations between human case residences and communal roosts were non-significant for house sparrows, and were negative for great-tailed grackle. Several theories that explain these observations are discussed.

BEHIND *Bd*

Batrachochytrium dendrobatidis (*Bd*), is implicated in worldwide amphibian declines and transitions from the

mouthparts of tadpoles to the hindlimbs during metamorphosis. McMahon and Rohr show consistency in the timing of the transition of *Bd* from mouthparts to hindlimbs across two frog species. Keratin and *Bd* simultaneously declined from the mouthparts but keratin on the hindlimbs appeared before *Bd* was detectable. Predictive functions for the relationships between developmental stage and keratin and developmental stage and *Bd* for mouthparts and hindlimbs are provided so that researchers can optimize sampling designs and minimize erroneous conclusions associated with missing *Bd* infections or misestimating *Bd* abundance.