

In This Issue

ANIMALS AS SENTINELS OF ENVIRONMENTAL HAZARDS: ASSESSING THE EVIDENCE BASE

Rabinowitz et al. break new ground in their systematic review of animals as sentinels of chemical or biological environmental hazards. Although the links among human, animal, and wildlife health are the focus of increasing research and media attention, there has been no systematic appraisal of evidence available from the peer-reviewed literature. This review identifies opportunities and limitations in our classification of animal sentinel events and in the methods used to investigate them, as well as barriers to using such data for evidence-based human health decisions. The review provides a foundation for guidelines for animal sentinel studies and also highlights the need to improve research and communication to respond to the rate, scale, and severity of hazards that affect the health of both animal and humans.

LYME DISEASE RISK AND CLIMATE CHANGE IN NORTH AMERICA

Although scientists are certain that climate change will influence future disease risk, no consensus and little direct evidence exist on the details and direction of the change in risk. **Brownstein et al.** provide among the most compelling evidence yet for the role of climate change in the geographic distribution of the Lyme disease vector *Isoixodes scapularis* and also project how disease risk will change in North America during this century. This was accomplished by linking a highly predictive model of *I. scapularis*' current distribution to climate change scenarios and extrapolating from existing climate change data. The projected vector

range expansion and contraction in the U.S. and Canada provide new insights into the role of climate change in disease emergence and the value of ecologic modeling for developing intervention strategies.

CROSSING SCALES AND SECTORS TO RESPOND TO DETERMINANTS OF HEALTH IN UCAYALI, PERU

Goy and Waltner-Toews question the wisdom of designing health services based on the biomedical model through their cross-cutting examination of the determinants of health in the Ucayali province of Peru, which forms part of the Amazon drainage basin. Using a regional analysis of vulnerable groups (including women and indigenous peoples) and a broad conceptualization of the determinants of health, they draw attention to a suite of new emphases for the health sector. Their call for closer attention to “natural resource management, education and empowerment of women, integration of traditional and biomedical care, improved health information management and community mobilization for health” is thought provoking and prompts the question: how should an appropriate health bureaucracy be structured?

THE PATHOLOGY OF HUMAN POPULATION

The ecologic carrying capacity of our planet's human population has been the subject of numerous scholarly studies, as well as of speculative, and often less scholarly, forays into one of the most complex sustainability issues facing humanity. **Fowler** sheds new light on this problem by using a meta-

analysis of extensive data on animal population density considered in terms of the health and sustainability of our species, as well as the biotic system in which humanity is embedded. The result demonstrates how human (and domestic animal) population density is clearly anomalous and indicative of a pathologic state. The author argues that a systemic remedy is indicated, but whether society is capable of self-administering the treatment remains uncertain.

UNSEEN HAZARDS IN MEXICO CITY: GROUNDWATER CONTAMINATION AND HEALTH INEQUALITIES

Although air pollution may be the most obvious environmental hazard in Mexico City, contamination of soil and groundwater resources poses an unseen hazard that warrants explicit attention. **Cifuentes and Rodriguez'** study integrates geographic information systems, groundwater quality, and cross-sectional survey data to confirm the increased risk of diarrhea for children who receive water from contaminated wells and live in nonowned homes not served by sanitation facilities and where the water is perceived as unpleasant. The interdisciplinary approach of the study highlights the value of work that can expose the links among urban sprawl, ecosystem degradation, poverty, and determinants of health.

WILDFIRE SMOKE, FIRE MANAGEMENT, AND HUMAN HEALTH

Broadscale wildfires produce airborne particulates, and debate over their human health effects continues: can

associations between hospital admissions and particulates be demonstrated statistically, and, if so, which particulates? **Bowman and Johnston** present an appraisal of recent literature and a reanalysis of findings from Darwin, Australia, confirming a positive association. Of particular note is their conclusion that a threshold level seems to exist at a particle size below some Western standards for airborne particulates. The type of fire could also be held more accountable: they distinguish between the frequent, and mostly deliberately lit, fires of the early dry season and the infrequent and uncontrolled wildfires of the late season. This study will have implications for our considerations of global climate change and urban expansion.

THE EFFECT OF INVASIVE WATER HYACINTH ON SCHISTOSOMIASIS IN LAKE VICTORIA

It is often remarked that invasive species can be equated, in epidemiologic terms, with ecologic infections. Both represent opportunistic exploitation by an agent of superior adaptive capacity that results in injury to a "host." **Plummer** provides evidence for a relationship between the widespread aquatic invasive species water hyacinth and the parasitic disease schistosomiasis in a field study at Lake Victoria, East Africa. Enclosures were used to manipulate plant density and observe the short-term effect on the snail host species of *Schistosoma mansoni*. The results suggest that an invasive species may contribute indirectly to the epidemiology of one of the world's most important human parasitic diseases.

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