



Issue 175 | Jan 23, 2015 | Focus on WASH & Zoonotic Diseases

A zoonosis is any disease or infection that is naturally transmissible from vertebrate animals to humans. Today, approximately 75 percent of newly emerging infectious diseases are zoonoses that result from various anthropogenic, genetic, ecologic, socio-economic, and climatic factors. This issue contains overviews and country studies of zoonotic diseases associated with WASH factors. Included are projects from USAID, articles on the One Health concept, resources from the World Health Organization, and studies on Ebola and other zoonotic diseases.

OVERVIEWS

Human Diarrhea Infections Associated with Domestic Animal Husbandry: A Systematic Review and Meta-Analysis. *Trans Roy Soc Trop Med Hyg*, Mar 2014. L Zambrano. [Link](#)

This review examines the evidence of an association between domestic exposure to food-producing animals and cases of human diarrhea and specific enteric infections. Results suggest that domestic poultry and livestock exposures are associated with diarrheal illness in humans. Failure to ascertain the microbial cause of disease may mask this effect. Exposure to domestic animals should be considered a risk factor for human diarrheal illness, and additional studies may identify potential mitigation strategies to address this risk.

Capacity Building Efforts and Perceptions for Wildlife Surveillance to Detect Zoonotic Pathogens: Comparing Stakeholder Perspectives. *BMC Public Health*, July 2014. J Schwind. [Link](#)

The capacity to conduct zoonotic pathogen surveillance in wildlife is critical for the recognition and identification of emerging health threats. The PREDICT project, a component of USAID's Emerging Pandemic Threats program, has introduced capacity building efforts to increase zoonotic pathogen surveillance in wildlife in global "hot spot" regions where zoonotic disease emergence is likely to occur. Understanding priorities, challenges, and opportunities from the perspectives of the stakeholders is a key component of any successful capacity building program.

Investigating the Zoonotic Origin of the West African Ebola Epidemic. *EMBO Molec Med*, Dec 2014. A Saez. [Link](#)

Researchers investigated the zoonotic origins of the epidemic using wildlife surveys, interviews, and molecular analyses of bat and environmental samples. They found no evidence for a concurrent outbreak in larger wildlife. Exposure to fruit bats is common in the

region, but the index case may have been infected by playing in a hollow tree housing a colony of insectivorous free-tailed. Bats in this family have previously been discussed as potential sources for Ebola virus outbreaks, and experimental data have shown that this species can survive experimental infection. These analyses expand the range of possible Ebola virus sources to include insectivorous bats and reiterate the importance of broader sampling efforts to understand Ebola virus ecology.

The Global One Health Paradigm: Challenges and Opportunities for Tackling Infectious Diseases at the Human, Animal, and Environment Interface in Low-Resource Settings. *PLoS Neg Trop Dis*, Nov 2014. W Gebreyes. [Link](#)

The One Health concept recognizes that the health of humans is connected to the health of animals and the environment. The aim of this review is to highlight advances in key zoonotic disease areas and One Health capacity needs. The complex nature of zoonotic diseases and the limited resources in developing countries are a reminder that the need for implementation of a global One Health approach in low-resource settings is crucial.

Emerging Infectious Diseases: Opportunities at the Human-Animal-Environment Interface. *Veterinary Record*, 174(22) 2014. M Dixon. [Link](#)

Infectious diseases pose a serious threat to the well-being of both human and animal populations. The fifth article in *Veterinary Record's* series promoting One Health examines lessons learned from previous disease outbreaks; the authors also consider current threats and how a better understanding of underlying risk factors could stimulate a paradigm shift from treatment to prevention of zoonotic infectious diseases.

Domesticated Animals Provide Vital Link to Emergence of New Diseases.

ScienceDaily, May 2014. University of Liverpool. [Link](#)

Pets and other domesticated animals could provide new clues into the emergence of infections that can spread between animals and humans. This study showed that the number of parasites and pathogens shared by humans and animals is related to how long animals have been domesticated. The findings suggest that although wild animals may be important for the transmission of new diseases to humans, humanity's oldest companions—livestock and pets such as cattle and dogs—provide the vital link in the emergence of new diseases.

Emerging Foodborne Parasitic Zoonoses: A Bird's Eye View. *Advances in Animal and Veterinary Sciences*, April 2014. A Singh. [Link](#)

This paper reviews the most important emerging food-borne parasites, with emphasis on transmission routes. Overall, there is an urgent need for better monitoring and control of food-borne parasites using new technologies. Robust, efficient detection, viability, and typing methods are required to assess risks and to further epidemiological understanding.

Zoonotic Diseases and Public Health in Africa: Neglect or Negligence? 2013.

University of Edinburgh. [Video](#)

Professor Sue Welburn, director of Global Health Academy, presents this Global Health seminar.

Transmission Catalog Proposed to Help Combat Zoonotic Diseases. *Nature Medicine*, July 2014. E Dolgin. [Link](#)

Monkeys and apes are only one potential reservoir for new human diseases. Just last month, for example, scientists pinpointed camels as the direct source of the virus responsible for Middle East respiratory syndrome, a new disease that has claimed more than 300 lives since it

was discovered in 2012. Bats, rodents, and various other mammals host a large number of emerging diseases, too.

How to Stop the Next Ebola: Call in the Veterinarians. *National Journal*, Nov 2014. B Resnick. [Link](#)

One Health is a concept connecting human medical and veterinary science. And in this framework veterinarians are the sentinels, monitoring the animal kingdom for potential threats to humans.

COUNTRY STUDIES

Wildlife-Related Zoonotic Diseases among Pastoralists in Uganda, 2014. IDRC. [Video](#)

In southwestern Uganda, population growth, climate change, and agricultural policies have reduced access to grazing and water points, forcing pastoralists to adopt sedentary lifestyles in and around wildlife conservation areas. Researchers from Makerere University studied the impact of social and environmental changes on the health of pastoralist communities around Lake Mburo National Park. They assessed the impact of zoonotic diseases on animal and human health, and their effects on livestock value chains with a view to developing strategies to reduce risks and vulnerability.

Distribution and Clinical Manifestations of Cryptosporidium Species and Subtypes in HIV/AIDS Patients in Ethiopia. *PLoS Neg Trop Dis*, Apr 2014. H Adamu. [Link](#)

The disease burden of *Cryptosporidium parvum* and the role of zoonotic transmission in cryptosporidiosis epidemiology are poorly understood in developing countries. In this study, we examined the distribution and clinical manifestations of *Cryptosporidium* species and subtypes in HIV/AIDS patients in Addis Ababa, Ethiopia. The common occurrence of *C. parvum* zoonotic subtype family IIa, combined with calf contact as a significant risk factor, suggest that zoonotic transmission is important. Improved hygiene and avoidance of calf contact should be advocated to reduce cryptosporidiosis transmission in HIV/AIDS patients in the study setting.

Controlling Parasites, Understanding Practices: The Biosocial Complexity of a One Health Intervention for Neglected Zoonotic Helminths in Northern Lao PDR. *Social Science & Medicine*, Nov 2014. K Bardosh. [Link](#)

A parasitological survey in northern Lao PDR showed a remote ethnic minority village to be hyper-endemic for *Taenia solium*, a neglected tropical disease that impacts human and pig health. The survey found that risk behaviors were mediated by various social determinants, including limited market access; interrelationships between alcohol, ancestral sacrifices, and the consumption of raw pork; seasonal variations; and poor latrine coverage. Only 16 percent of households had latrines, attributed to the unacceptability of dry latrines, lack of water access, poor building techniques, and poverty. While women could explain *T. solium* transmission, most men and children could not, revealing that distributed posters/leaflets relied too heavily on text and ambiguous images.

Epidemiology of Pathogenic Enterobacteria in Humans, Livestock, and Peridomestic Rodents in Rural Madagascar. *PLoS One*, July 2014. D Bublitz. [Link](#)

Researchers investigated patterns of infection with Enterotoxigenic *Escherichia coli*, *Shigella* spp., *Salmonella enterica*, *Vibrio cholerae*, and *Yersinia* spp. (*enterocolitica* and *pseudotuberculosis*) in southeastern Madagascar where the potential for the aforementioned interactions is high. The pilot project conducted surveys to examine behaviors potentially associated with risk of infection and if infection with specific enterobacteria species was

associated with diarrheal disease.

The Burden of Parasitic Zoonoses in Nepal: A Systematic Review. *PLoS Neg Trop Dis*, Jan 2014. B Devleesschauwer. [Link](#)

Parasitic zoonoses (PZs) pose a significant but often neglected threat to public health, especially in developing countries. It was found that a large number of PZs are present in Nepal and are imposing an impact higher than that of malaria and comparable to that of HIV/AIDS. These results therefore suggest that PZs deserve greater attention and more intensive surveillance. Furthermore, this study has shown that even in settings with limited surveillance capacity, it is possible to quantify the impact of neglected diseases and, consequently, to break the vicious circle of neglect.

Brucellosis as an Emerging Threat in Developing Economies: Lessons from Nigeria. *PLoS Neg Trop Dis*, July 2014. M Ducrottoy. [Link](#)

Nigeria is the most populous country in Africa, has a large proportion of the world's poor livestock keepers, and is a hot spot for neglected zoonoses. There appears to be an increasing risk of re-emergence of brucellosis in sub-Saharan Africa, as a result of the co-existence of pastoralist movements and the increase of intensive management resulting from growing urbanization and food demand. Highly contagious zoonoses like brucellosis pose a threat with far-reaching social and political consequences.

Review of Parasitic Zoonoses in Egypt. *Trop Med Intl Health*, Mar 2014. A Youssef. [Link](#)

This review presents a comprehensive picture of the zoonotic parasitic diseases in Egypt, with particular reference to their relative prevalence among humans, animal reservoirs of infection, and sources of human infection. Animal reservoirs of parasitic zoonoses have been identified in Egypt, especially in rodents, stray dogs and cats, as well as vectors, typically mosquitoes and ticks, which constitute potential risks for disease transmission.

Children of Senegal River Basin Show the Highest Prevalence of Blastocystis sp. Ever Observed Worldwide. *BMC Infect Dis*, March 2014. D Safadi. [Link](#)

In this country, the prevalence of Blastocystis sp. in a cohort of children living in a rural area reached an unprecedented peak of 100 percent. Such high prevalence may reflect different exposure of individuals to animal and environmental sources of infection together with large-scale human-to-human transmission. This study also raises questions about the real pathogenicity of Blastocystis sp. since more than half of children infected by this parasite presented various gastrointestinal symptoms, and highlights the socio-economic impact of blastocystosis in developing countries with low environmental conditions and quality of life.

WEBSITES/PROJECTS

One Health Initiative – ([Link](#))

Recognizing that human health (including mental health via the human-animal bond phenomenon), animal health, and ecosystem health are inextricably linked, One Health seeks to promote, improve, and defend the health and well-being of all species by enhancing cooperation and collaboration among physicians, veterinarians, and other scientific health and environmental professionals and by promoting strengths in leadership and management to achieve these goals.

USAID Emerging Pandemic Threats – ([Link](#))

The Emerging Pandemic Threats program strengthens capacities in developing countries to

prevent, detect, and control infectious diseases in animals and people with an emphasis on early identification of, and response to, dangerous pathogens from animals before they can become significant threats to human health.

USAID PREDICT 2 Factsheet, 2014. USAID. [Link](#)

PREDICT 2 will improve the understanding of the dynamics of zoonotic virus spillover, evolution, amplification, and spread in order to forecast risk and inform prevention and control measures, facilitating and optimizing policies and practices that reduce disease transmission risk through sound, science-based interventions.

World Health Organization/Zoonoses – ([Link](#))

This website has links to reports and other WHO resources on zoonoses.

WASHplus Weeklies highlight topics such as Urban WASH, Household Air Pollution, Innovation, Household Water Treatment and Storage, Hand Washing, Integration, and more. If you would like to feature your organization's materials in upcoming issues, please send them to Dan Campbell, WASHplus Knowledge Resources Specialist, at dacampbell@fhi360.org.



About WASHplus - WASHplus, a five-year project funded through USAID's Bureau for Global Health, supports healthy households and communities by creating and delivering interventions that lead to improvements in access, practice and health outcomes related to water, sanitation, hygiene (WASH) and household air pollution (HAP). WASHplus uses at-scale, targeted as well as integrated approaches to reduce diarrheal diseases and acute respiratory infections, the two top killers of children under five years of age globally. For information, visit www.washplus.org or email: contact@washplus.org.