



ONE WORLD,

ONE MEDICINE,

ONE HEALTH

One Health Intellectual Exchange

Weekly Discussions / Course: Philosophy to Practical Integration of Human, Animal and Environmental Health

A weekly discussion series, sponsored by the **North Carolina One Health Collaborative** within the NCBC IEG Program to enhance collaborations between physicians, veterinarians, researchers and other local/global/environmental health professionals by increasing public awareness of the interconnectedness of people, animals and the environment.

(Available each spring for credit if desired)

2nd 2013 Weekly Session - Tuesday, January 15
5:30 – 7:30 p.m.

Microbial impacts of animal agriculture on water quality and human health risks

Mark Sobsey, MS, PhD, UNC Professor, Department of Environmental Sciences and Engineering, Director, Environmental Microbiology Laboratory

And

WaSH (Water Safety and Hygiene) and One Health

Jamie Bartram, PhD, UNC Professor, Department of Environmental Sciences & Engineering, UNC, Director of the Water Institute

Meets Tuesdays, 5:30 – 7:30 p.m. at the North Carolina Biotechnology Center
15 T.W. Alexander Drive Research Triangle Park, NC 27709

Directions: www.ncbiotech.org/directions/

Suggestions? Ideas? Contact Cheryl Stroud, Steering Comm. Chair cms7earth@gmail.com

Add yourself to the listserve with Listserv Manager Liz Selisker, liz_selisker@ncsu.edu

For Speaker Bio's, Suggested Readings, Cancellation notices and additional background

<http://nconehealthcollaborative.weebly.com/index.htm>

<http://triangleglobalhealth.ning.com/group/tghcnehealth>

<http://onehealtheducation.blogspot.com/>

For more information on the course option contact: Course TA Anne Stine anne.stine@duke.edu

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Chris Woods at Duke chris.woods@duke.edu

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Mark Sobsey, PhD



Jamie Bartram, PhD

Mark D. Sobsey, PhD, UNC Professor, Department of Environmental Sciences and Engineering, Director, Environmental Microbiology Laboratory

Dr. Mark Sobsey is a Kenan Distinguished Professor of Environmental Sciences and Engineering, specializing in Environmental Health Microbiology and Water-Sanitation and Hygiene in the Department of Environmental Sciences and Engineering, Gillings School of Global Public Health, University of North Carolina at Chapel Hill. He received a B.S. (Biology) and M.S. (Hygiene) from the University of Pittsburgh, Pa. and a Ph.D. in Environmental Health Sciences from the School of Public Health, University of California at Berkeley. Professor Sobsey is internationally known for research, teaching and service in environmental health microbiology and virology and in water, sanitation and hygiene, with more than 200 published papers and reports. His research, teaching and service encompass the detection, characterization, occurrence, environmental survival/transport/fate, treatment, human health effects characterization and risk assessment of viruses, bacteria and protozoa of public health concern in water, wastewater, biosolids, soil, air and food for the prevention and control of water-, food- and excreta-borne disease. His most recent research focuses on household water treatment for improved water quality and health. Professor Sobsey is an author, consultant and scientific advisor to the World Health Organization, UNICEF, The World Bank, US Agency for International Development, US Environmental Protection Agency, The Centers for Disease Control and Prevention, the State of North Carolina and other international, national and state entities

Food production animals such as swine, poultry and cattle are often infected or colonized with pathogenic bacteria, parasites and viruses that are fecally shed at high concentrations. In addition, these food animals are often routinely fed antibiotics in their diets, leading to the development and excretion of high concentrations of both the antibiotics and antibiotic resistant bacteria. If the manure waste of these animals is not adequately managed, the zoonotic pathogens, including antibiotic resistant bacteria, can contaminate ambient waters and pose risks to human and animal health. This presentation will consider the following aspects of this topic:

1. The enteric zoonotic pathogens fecally shed by food production animals,
2. The occurrence and concentration antibiotic resistant bacteria, including pathogens, fecally shed by and present in animal manure of food production animals,
3. The effects of current and proposed animal waste treatment and management practices on the presence and concentrations of these pathogens and antibiotic resistant bacteria in animal agricultural waste emissions,
4. The evidence that these pathogenic and antibiotic resistant microbes from food production animals contaminate ambient waters, and
5. The evidence of possible risks to human health from these food animal pathogens, including evidence of waterborne outbreaks

Suggested Readings:

Graham JP, Nachman KE. Managing waste from confined animal feeding operations in the United States: the need for sanitary reform. J Water Health. 2010 Dec;8(4):646-70. Epub 2010 Jun 8.

Ziemer CJ, Bonner JM, Cole D, Vinjé J, Constantini V, Goyal S, Gramer M, Mackie R, Meng XJ, Myers G, Saif LJ. Fate and transport of zoonotic, bacterial, viral, and parasitic pathogens during swine manure treatment, storage, and land application. J Anim Sci. 2010 Apr;88(13 Suppl):E84-94. Epub 2010 Mar 26.

Topp E, Scott A, Lapen DR, Lyautey E, Duriez P. Livestock waste treatment systems for reducing environmental exposure to hazardous enteric pathogens: some considerations. Bioresour Technol. 2009 Nov;100(22):5395-8. Epub 2008 Dec 13.

Jamie Bartram, PhD, UNC Professor, Department of Environmental Sciences & Engineering, Director of the Water Institute

Dr. Bartram received his PhD from the University of Surrey, UK. From 1998 to 2009 he was based at the World Health Organization's Headquarters. For most of this time he was the Coordinator of the Water, Sanitation, Hygiene and Health Unit which received international recognition for leadership in evidence based policy and good practice. From 2004 to 2006 Dr Bartram also served as the first chair of UN-Water – the mechanism responsible to ensure coherence and coordination in UN system actions related to water, overseeing establishment of Terms of Reference, inter-agency workplan development, trebling of direct financial support and establishment of two new offices.

Dr Bartram's previous posts have also included: Coordinator for the Programme on Assessing and Managing Environmental Risks to Health at WHO/HQ; Manager, Water and Wastes at the WHO European Centre for Environment and Health in Rome – working especially on management of international waters; Head of the Environmental Health Division of the Robens Institute of the University of Surrey in the UK; and Public Health Scientist in Peru. He has worked in diverse areas of public health and disease prevention, especially in relation to environment and health and water supply and sanitation; and in more than 60 developing and developed countries worldwide.

He is author of more than 50 academic papers; author or editor of more than 40 books and author of more than 50 book chapters

Learning Objectives:

1. An understanding of the disease burden associated with deficient hygiene, sanitation and water supply. A massive disease burden is associated with deficient hygiene, sanitation, and water supply and safety, which is associated with diverse outcomes, causes, and determinants
2. Describing proven, cost-effective interventions - the total benefits of these interventions are greater than the health benefits alone and can be valued at more than the costs of the interventions.
3. Policy implications - Hygiene, sanitation, and water supply are development priorities, yet the ambition of international policy on drinking water and sanitation is inadequate.
4. Interconnectedness - While the disease burden is concentrated in the developing world, hygiene, sanitation, and water supply continue to have health implications in the developed world.
5. Importance of multidisciplinary collaborations- The active involvement of health professionals in hygiene, sanitation, and water supply is crucial to accelerating and consolidating progress for health.

Suggested Readings:

Bartram J, Cairncross S. 2010. Hygiene, Sanitation, and Water: Forgotten Foundations of Health. *PLoS Medicine* 7(11):e1000367.

<http://www.plosmedicine.org/article/info:doi/10.1371/journal.pmed.1000367>

Bartram J et al. 2010. How health professionals can leverage health gains from improved water, sanitation and hygiene practices. *Perspectives in Public Health* 130(5):215-221.

<http://rsh.sagepub.com/content/130/5/215.short>

Cairncross S et al. 2010. Hygiene, Sanitation, and Water: What Needs to Be Done? *PLoS Medicine* 7(11):e1000365.

<http://www.plosmedicine.org/article/info:doi/10.1371/journal.pmed.1000365>

Gunnarsdottir, MJ et al, 2012. Benefits of Water Safety Plans: Microbiology, Compliance, and Public Health, [Environ Sci Technol](#). 46(14):7782-9.

<http://pubs.acs.org/doi/abs/10.1021/es300372h?mi=13soub4&af=R&pageSize=20&searchText=ICD>