Health Sciences Center for Global Health The Global Address

Attention Global Health Researchers! Don't Be Left Out!

The next issue of *The Global Address* will feature global health-related research at OSU. If you are doing research at an international site or research that focuses on a globally-related topic we would like to hear from you.

Click here to submit your project

We are interested in topics from **A**ir pollution to **Z**oonotic diseases and everything in between. As a globally engaged university we want to highlight the exciting work that is happening both here and with partners abroad. Please make sure we include you by e-mailing <u>Pamela Potter</u> or calling 292-3684.





Maggie Rosen, Class of 2010 medical student (pictured here treating a patient with pericentesis), traveled to Fort-Liberté, Haiti following the devastating earthquake.

Helping Out In Haiti

I wasn't sure what to expect when I departed Columbus for my trip to Haiti. I had been anxiously awaiting it, and was excited to have an opportunity to travel abroad and provide medical care in an underserved community. The trip was planned prior to the earthquake and has been occurring annually for more than 5 years. This year was my first time joining the group from Glen Echo Church. My family friend has been a regular on their mission trip for several years, and this was the first year I was able to take vacation and join him.

The community where we worked is always in need of medical aid and throughout the year different groups of physicians, nurses, pharmacists and other volunteers visit the city of Fort-Liberté to care for the people there.

Upon arriving in Fort-Liberté we unpacked the loads of luggage (two 50lb bags per person filled mostly with medications and other medical supplies) and stocked the clinic. It was overwhelming to see such an abundance of supplies filling the clinic shelves.

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Graduate Interdisciplinary Specialization in Global Health (GISGH) Update

In the June 2009 issue of *The Global Address*, we announced a newly created Specialization in Global Health for graduate and professional students. As of March 2010, nine months later, there are over 40 students from seven colleges participating in the program.

Not a part of the GISGH? Maybe you should be! Details can be found <u>online</u>, or contact <u>Pamela Potter</u> for more information.

My Take: Water, Sanitation, & Public Health in Rural China

Despite its remarkable growing economy which has pulled hundreds of millions of people out of poverty, China is struggling with some of the most serious environmental health problems on the planet - for example, over 300 (out of 740) million people in rural China still don't have access to safe drinking water and appropriate sanitation, making these people vulnerable to infections and illness caused by many water- and wastemediated infectious diseases.



Diseases typically occurring in the rural environment may include diarrhea, hepatitis A, typhoid, and some parasitic diseases such as schistosomiasis, ascariasis, trichuriasis, and hookworm infections. Understanding factors driving transmission of these diseases and instituting sustainable control strategies remain a priority and public health challenge in the rural environment of China.

Several years ago, together with my colleagues at Berkeley School of Public Health and Institute of Parasitic Disease of Sichuan CDC, we initiated a project on schistosomiasis control in Xichang County, Sichuan Province, China. Schistosomiasis is a parasitic disease endemic to 74 developing countries and is transmitted to humans through dermal contact of water contaminated by the parasite via specific snail intermediate hosts. Lack of sanitation facilities (e.g. treatment of human and animal wastes) has been recognized as a major player in driving transmission of schistosomiasis. The study was originally motivated by concerns about the long-term effects of global warming on disease transmission, and more immediately, the scale and impact of the ecological changes arising from completion of the Three Gorges Dam.

Xichang lies in the southern portion of the Anning River Valley in southwestern China inhabited by approximately 760 thousand people. The population consists of people of 28 ethnic groups with the majority being Han and Yi people. The climate is subtropical with an annual average temperature of 17°C (62°F) and annual rainfall of about 1100 mm (>43 inches), more than 90% of which falls in the rainy season typically between June and September. Typical landscape is largely irrigated agricultural land with two growing seasons-one in spring and major crops include rice, corns, vegetables, and to-

bacco (in certain areas), while the fall crops primarily consist of wheat, broad beans and garlic. The living and working style of people in these villages are usually very similar. Coverage of sanitation was very low, less than 10% in 2002. Historically, schistosomiasis was highly prevalent in rural communities of Xichang, in particular Chuanxing and Daxing townships, where, according to our survey conducted in 2000, human prevalence of infection on average was around 30% with some villages up to 74%. After several years' extensive research work, it has become clear to us that biomedical intervention (e.g. chemotherapy) alone won't be able to achieve a long-term sustainable control of transmission, which motivated us to seek alternative approaches to complement the current measure. Among several options, treating wastes through installation of anaerobic digestion systems at the household level appealed to us.



Around 1.1 billion people globally do not have access to improved water supply sources whereas 2.4 billion people do not have access to any type of improved sanitation facility.¹

Developing a worldview of health

Anaerobic digestion, or biogas digestion, is the process in which microorganisms break down biodegradable materials in the absence of oxygen, and is commonly used to treat wastes with benefits of reducing pathogen (e.g. bacteria and virus) in the wastes and generating biogas (e.g. methane) which can be used as an energy source. Although there are speculations that anaerobic digestion may inactivate parasitic eggs, it was unclear to us if it worked. We pilot-tested an experiment using schistosoma and roundworm eggs in a couple households in Daxing township and were excited by the initial result – almost 85% percent of these parasitic eggs could be inactivated by the anaerobic digestion process. Motivated by this result and to explore the public health impact at the community scale, we worked with local rural energy engineers to build biogas stoves for 95.4% households (41 out of 43) in Xinlong 7, a village of Chuanxing township. The construction project lasted a couple years and was finished in the summer of 2005.

The number of people with access to safe drinking-water rose from 4.1 billion in 1990 to 5.7 billion in 2006. About 1.1 billion people in developing regions gained access to improved sanitation in the same period.²

In 2008 an extensive human survey was conducted in Xichang County and showed that human prevalence of infection was down to about 7% from 64.1% in 2000. Different interventions including chemotherapy and waste management through biogas digestion have contributed to such significant reduction in human infection. We are currently using a disease transmission modeling approach, coupled with data collected in the field, to analyze specific contribution of the waste management as a sustainable and environment friendly strategy of multiple co-benefits to the control of schistosomiasis transmission and we expect to see results by the end of this year.



Villagers working in a rice field in Daxing, a township with a historically high prevalence of schistosomiasis. This is a common way that people are exposed to contaminated water.



"Water contains schistosome and is dangerous." This sign is everywhere in the endemic villages.

What is...

Schistosomiasis, sometimes referred to as bilharzia, is caused by a parasitic worm (Schistosoma) which penetrates the skin of people who come in to contact with contaminated water. Fresh water becomes contaminated by Schistosoma eggs when infected people urinate or defecate in the water. Approximately 200 million people are infected. The worms live in the intestine, causing symptoms from blood in the urine to impaired growth, development, and performance. In severe cases, the infection leads to bladder cancer and kidney, liver, and spleen malfunction. Trichuriasis (whipworm) is caused by a parasite called the human whipworm, a soil-transmitted worm. The worms' eggs enter the body on food or on hands that have come into contact with soil contaminated with the eggs. It is estimated that 800 million people are infected with the parasite and that 10,000 deaths result each year. The parasites' eggs hatch in the small intestine and attach to the large intestine, where they cause blood loss and deplete the host of nutrients. This adversely affects childhood growth and physical fitness and impairs intellectual and cognitive development. Ascariasis (roundworm) is the most common human worm infection. Infection occurs worldwide and is most prevalent in tropical and subtropical areas where sanitation and hygiene are poor. The parasite lives in the small intestine and children are infected more often than adults. Adult female worms can grow over 12 inches in length, though adult males are smaller. This adversely affects childhood growth and physical fitness and impairs intellectual and cognitive development. There are 1.2 billion people infected with ascariasis and 60,000 deaths are attributed to the disease each year.

Schistosomiasis Control Initiative, "7 most prevalent Neglected Tropical Diseases." http://www3.imperial.ac.uk/schisto/whatwedo/7ntds (accessed Mar. 11, 2010).

¹ World Health Organization, "Water Supply, sanitation and hygiene development." http://www.who.int/water_sanitation_health/hygiene/en/index.html (accessed Mar. 17, 2010).

² World Health Organization, "Progress on health-related Millennium Development Goals (MDGs)." http://www.who.int/mediacentre/factsheets/fs290/en/index.html (accessed Mar. 17, 2010).

Developing a worldview of health

Helping Out In Haiti The following afternoon and evening we held the first clinic. We saw a variety of patients, many with similar complaints to what I might have seen in a family medicine office here, others with typical ailments in Haiti like worms or typhoid symptoms, and sprinkled amongst all those patient were also some people with more urgent or severe problems.

There were a few patients who particularly stood out from my week in the clinic. On the first day we saw a woman with a very infected dental abscess and treated her with IV antibiotics. She returned the next day for a second round and already her face was half as swollen and more importantly it was filled with a smile. I wondered what she would have done if we had not been staffing the clinic that particular week.

Later in the week I had a patient with classic symptoms of hyperthyroidism who had seen a doctor and had been prescribed an inadequate dose of medication for treatment. Unfortunately she had no way to obtain the proper dose and we didn't have the medication she needed with us. We were only able to treat some of her symptoms and hope that the next group to arrive would bring the appropriate medication and start her on an adequate dose.

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Patients lined up at the clinic

With both these patients I was glad we were able to provide some relief, but each day I felt as though there was so much more that many of these patients needed and we just weren't equipped to provide.

Having never been on the trip prior to the earthquake I'm not sure how things might have been different. We saw significantly more patients than in years past, and a few who had come from Port-au-Prince, some with injuries still healing after the disaster. I do know this community was in great need prior to the earthquake and as Haiti begins to rebuild will continue to need even more support. It was a privilege to be able to participate in this trip, to work among a group of amazing individuals in such a welcoming and thankful community. I hope to continue to have opportunities to provide medical care in Haiti and work towards a more sustainable comprehensive care for the people there.



Global Health Day May 17, 2010

> 10:30am Official Ride-in, Medical Center Plaza

10:35am Welcoming Catherine Lucey, MD, FACP, Vice Dean for Education, College of Medicine William Brustein, PhD, Vice Provost for Global Strategies and International Affairs

11:00am BBQ/Fair (cultural booths, health activities, games, etc.)

11:45am "LOVE, LABOR, LOSS" documentary film on obstetric fistula (Meiling 160)

1:00pm "LOVE, LABOR, LOSS" small group discussion (Meiling 160)

4:00pm Metro High School iMovies presentation (Meiling 112)

5:00pm Richard Anderson, Chief Development Officer, HEAL Africa Representative from World Bicycle Relief (Meiling 112) Snacks provided by Whole Foods

Columbus Council on World Affairs Annual Awards Ceremony



The <u>Columbus Council on World Affairs</u> hosted its 2010 International Awards Ceremony on March 9. American Electric Power was named International Company of the Year with CEO Michael G. Morris accepting on AEP's behalf. The International Educator of the Year was Tricia Fellinger-Reyes from Upper Arlington High School.

The OSU Health Sciences Center for Global Health and the OSUMC helped sponsor the program, which brings together local business, civic and academic leaders to discuss global trends and to provide education opportunities that Ohioans need to thrive in the global community.

The Global Address

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