



A common means of water storage in the Equadorian Andes.

Impure Water, Poor Sanitation Lead to Water-borne Illness

Exploring water and sanitation in rural communities of Ecuador

by Ashley Geyer and Jessica Steffl

In the summer of 2005, 13 students from the University of Wisconsin Schools of Nursing, Pharmacy, Medicine and Veterinary Medicine traveled to Ecuador for six weeks for a summer field school in community rural health. The purpose of the program was to give students a chance to apply cultural anthropology to medical and general health issues faced by developing countries, to participate in field visits and student-run clinics, and to experience cultural and language studies through Spanish school and home stay.

One of the health issues we studied was access to clean water and its connection to disease. Around the world, lack of or inaccessibility to clean water and basic sanitation remains a rampant problem. As of 2004, more than 2.6 billion people, over 40% of the world's population, did not have access to basic sanitation, and more

than one billion people still used unsafe sources of drinking water.² In Ecuador, poverty levels were estimated to be at 45% in 2001.¹ Water in much of the country is unsafe for human consumption due to contamination. The contaminated water supply fosters widespread and transmissible diseases. Diseases such as amoebic dysentery, cholera, hepatitis A and giardia are prevalent problems in Ecuador and all countries having a lack of clean water and inadequate sanitation. There is insufficient funding to make the necessary changes to the infrastructure of the water and sanitation systems.

We explored the water and sanitation system in Yambiro, a small rural community about two hours outside of Quito, the capitol of Ecuador. Prior to the building of Yambiro's present water system, the people of the community would walk nearly two hours to the nearest water source. After seven years of organizing

and searching for funds, the community was able to build a new water system in hopes of improving the quality of life of its residents. This project took place nearly 13 years ago.

The current system uses an underground spring in the mountains as the primary source of water. This source is at an elevation that is high enough to prevent any contamination from human waste. The water flows by gravity into three consecutive holding tanks. The purification process, treatment with chlorine, takes place in the second holding tank. There is no further treatment after this point. From these tanks, water flows to faucets located outside of individual homes located on the hills above Yambiro. The water pipe gets continuously smaller, ending with only half-inch tubing as the water flows into the village. The small tubing and low gravitational force at that point leads to extremely slow movement of the water. Although community members realized this problem would occur, nothing could be done because of a limited budget to create a better system.

This water system supplies Yambiro and four other communities. Small tubing and many users deplete the water supplies which creates limited access to water. Families in the communities, especially those at an elevation higher than the water tank, can only access the water in the early mornings. Because of this, families are forced to store water in large containers. These containers consist of everything from wheelbarrows to open cement sinks or even garbage cans, most of which are uncovered. The improper storage of the water makes it easy for contamination to occur.

Although the water from the faucets has acceptable bacterial counts, the stagnant water facilitates the growth of organisms. In addition, the sinks are often close to household latrines, making fecal contamination easy. Other problems include objects being thrown into the stored water and small animals drowning in the water. In addition, the water is used by livestock for drinking and by families as a source for drinking, bathing and washing clothes.

The residents of Yambiro were very aware that many of their illnesses were due to impure water. The women were especially concerned with how frequently their children experienced diarrhea. As a



Water flows by gravity from an underground spring into three holding tanks where it is chlorinated.

short-term solution to a very large problem, the UW students in the field school developed a simple way to purify small amounts of water for drinking. We held a clinic to educate the community on this water purification technique. The method involved filling empty five-liter water jugs with water, then with the use of a syringe, adding a precise amount of bleach containing chlorine (0.3 mL). We also dem-

onstrated that droppers could be used to measure eight drops of the chlorine solution rather than using syringes. All of these items are inexpensive and easily accessible to the community members. Although chlorine can be a dangerous substance, the amount needed for water purification is safe for consumption even if a 100-fold error is made in the process. We also educated community members on proper water storage and the importance of water purity for health and well-being.

People in Ecuador know the issues they face and understand how to correct them but are trapped because of poverty. Social status and lack of funding are major barriers to the improvement of small indigenous communities and of the entire country of Ecuador. Although we were unable to help the entire country within the six weeks of the field school, we were able to improve the lives of the

members of a small community.

In the pharmacy profession we tend to focus on treatment. However, this experience exemplified the need for prevention of disease through proper sanitation. Dispensing medications to the people of Yambiro would only bring about a temporary solution. In teaching the community, we also taught ourselves the importance of collaboration by working with students of other health care disciplines to reach a goal. We will be able to apply this experience to our future careers as our profession becomes more team-oriented. ●

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REFERENCES

1. "Ecuador Poverty Assessment" 2002. 13 Oct. 2005. www.worldbank.org
2. "World facing "silent emergency" as billions struggle without clean water or basic sanitation, say WHO and UNICEF". 26 Aug 2004. Accessed 13 Oct. 2005. <http://www.who.int/mediacentre/news/releases/2004/pr58/en/>

UW-Madison Establishes New Center for Global Health

The health science schools at the UW have announced the creation of the Center for Global Health. The Center is a collaborative initiative of the UW Schools of Medicine, Nursing, Pharmacy and Veterinary Medicine. Its mission is to develop and support education, research and partnerships to address health issues that transcend national boundaries, and to foster a network of global health scholars and practitioners.

The objectives and outcomes of the Center are as follows:

PROMOTE GLOBAL HEALTH EDUCATION: The Center for Global Health (CGH) will provide a rich spectrum of global health educational opportunities through courses, field experiences, seminars and an annual symposium. The Center is preparing to launch a Global Health Certificate in 2006 that will prepare students and mid-career health professionals for careers that include global health. Educational offerings include:

- Courses at the UW
- Field courses (Ecuador and Uganda)
- Study tours (Guatemala, Mexico, China)
- Clinical electives abroad

- Resident rotations
- Field research (for MPH or other students)
- Fellowship opportunities

FACILITATE GLOBAL HEALTH RESEARCH:

The CGH will serve as a clearinghouse for information and networking among UW-Madison faculty and staff with experience and/or interest in global health research. It will assist UW-Madison faculty and staff to seek and prepare interdisciplinary grants that are targeted to improve health abroad, or that expand on local or national efforts to include international dimensions. The Center will encourage faculty and staff who have global health research projects to include interested and qualified students.

BUILD PARTNERSHIPS FOR HEALTH:

The CGH seeks to establish lasting partnerships with individuals or institutions abroad that have the potential to include education, research and health services, and that allow for interdisciplinary collaboration. UW faculty or staff will work closely with counterparts abroad to ensure continuity, appropriateness and quality. Students and fellows will be incorporated into activities when possible.

Partnerships are at various stages of development in Belize, China, Ecuador, Uganda, Thailand and Vietnam.

FOSTER A NETWORK OF GLOBAL HEALTH SCHOLARS AND PRACTITIONERS:

Interested students, staff, residents, faculty, alumni and community members can join the Center for Global Health as affiliate members. Affiliates will receive invitations to global health events and notice of visitors to the UW-Madison; gain access to a data-base of global health affiliates which will enable them to network with individuals with similar geographic or topical interests; and contribute to building a community of teachers, students and scholars engaged in understanding and addressing global health.



LEARN MORE ABOUT THE CENTER FOR GLOBAL HEALTH OR BECOME AN AFFILIATE MEMBER
WWW.POPHEALTH.WISC.EDU/GHP

Editor's note: Students from the UW School of Pharmacy have been participating since 2003 in international experiences offered by the UW Global Health Program. Pharmacists with an interest in international health are encouraged to consider affiliate membership in the Center.