

Global Health Is (Local) Public Health

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In a world where nations and economies are increasingly interdependent—whether through the continuing globalization of the economy, ongoing demographic changes, or the rapidly rising costs of health care in various countries—illness in any population affects all people. The health of the world's population has become increasingly interconnected because disease does not recognize borders. As Brown and colleagues [1p62] remarked, "'Global health,' in general, implies consideration of the health needs of the people of the whole planet above concerns of particular nations."

In a recent article titled "Global Health Is Public Health," several deans of top-tier schools of public health, including the University of North Carolina (UNC) Gillings School of Global Public Health, asserted that "public health schools remain at the forefront of efforts to educate global health experts who are prepared to confront the global burden of disease" [2p536]. The title of the article reflects the philosophy of UNC's school of public health that global health and public health are indistinguishable and that global health is also *local* health.

The school of public health at UNC-Chapel Hill officially became the Gillings School of Global Public Health in Fall 2008 in recognition that, even at a public, state institution, *all health is global*. Initiatives undertaken since the name change have attempted to redefine public health education, including ensuring that all public health students understand how domestic and international problems and their solutions are interconnected and require collaborative, interdisciplinary teamwork. In a 2004 review of UNC's school of public health, the Association of International Educators noted that "global health is integrated across departments, programs, and centers and emphasizes the linkages between problems and solutions in developing countries and in industrialized, Western settings" [3p58]. This allows for an interdisciplinary approach to the study and teaching of both local and global health.

UNC-Chapel Hill has made "internationalization" and global health a priority, leading to the 2007 establishment of the UNC Institute for Global Health and Infectious Diseases, directed by Myron S. Cohen, the J. Herbert Bate Distinguished Professor of Medicine, Microbiology, and Public Health. This institute fosters an environment in which faculty, students, and the broader university community

work together in unique and innovative ways to address critical issues in global health and to shape the next generation of global health leaders across the campus. In this article, we provide several examples of UNC-Chapel Hill's research and education, to illustrate why global health is local health.

Water, Sanitation, and Hygiene

UNC-Chapel Hill has a strong reputation in water research, both domestically and internationally. Starting in the 1950s, faculty at UNC's school of public health have worked in North Carolina and worldwide on water issues. The first major international effort outside of the United States was led by Daniel Okun, who established a sanitary engineering program in Lima, Peru, in the 1950s [4]. Projects based outside of North Carolina helped faculty at the school of public health realize "its commitment to better the health of all the world's peoples" [4p84]. Today, there are over 20 faculty members in the Department of Environmental Sciences and Engineering who have expertise in water, sanitation, and/or hygiene. Under the leadership of Dean Barbara Rimer, the school of public health has made water a strategic priority at UNC-Chapel Hill, including the establishment of a new UNC Water Institute, led by renowned global water expert Jamie Bartram. The Water Institute will coordinate water research and programs at the school of public health, at UNC-Chapel Hill, and across the state to make access to clean drinking water a reality for millions of people worldwide.

Engineers Without Borders (EWB). The Daniel A. Okun Chapter of EWB, located at UNC-Chapel Hill, is particularly strong. This group of dedicated students from departments across the campus is involved in projects to improve community water systems at the local level in areas such as Moldova, Peru, as well as in their own community of Chapel Hill.

The partnership between EWB and the Rogers Road community, a historically black neighborhood in Chapel Hill, began in January 2009, when the community sought help from EWB to identify issues about possible contamination related to the nearby local landfill. Since then, EWB students have administered surveys to assess household water and sewer infrastructure and have tested the quality of community drinking and surface water [5]. The Orange County

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Health Department also tested the water and found that 9 of 11 wells were below US Environmental Protection Agency standards for water quality. EWB's ongoing efforts in this community include analyzing the results of water tests; studying odor, air quality, and health; engaging in a continuing dialogue with local, state, and federal governments to convey concerns about the environment; and organizing service projects to clean up the environment and improve living conditions.

In addition to its efforts in the Rogers Road community, the Daniel A. Okun chapter has been working in Moldova as part of the National Guard State Partnership Program that formally links North Carolina and Moldova. This summer, a group of students from the Department of Environmental Sciences and Engineering and the Department of Health Behavior and Health Education will return to Moldova to provide hygiene education to 2 schools in Moldova that is based on results of surveys students conducted on water and sanitation during the past 2 summers. In January 2008, former US Ambassador to Moldova Michael Kirby and current North Carolina Secretary of State Elaine Marshall asked UNC's school of public health to join the partnership to provide guidance in public health-related matters. The EWB project is just one of several initiatives that resulted from this original request.

Point-of-use water filters. Mark Sobsey, professor of environmental sciences and engineering, is internationally renowned for his research, teaching, and service in water, sanitation, and hygiene, with an emphasis on microbiology and virology. His research has addressed domestic and international water issues, ranging from swine wastewater in North Carolina and the southeastern United States to safe storage of drinking water in developing countries. Sobsey's work on sustainable point-of-use water filtration systems has led to the WaterSHED initiative, funded by the US Agency for International Development. This is a public-private partnership designed to bring effective, affordable water and sanitation products to market in Cambodia, Laos, and Vietnam.

Sobsey was invited to participate in the first LAUNCH event in March 2010, a program jointly sponsored by NASA, the US Agency for International Development, the US State Department, and Nike. He presented a proposal to the 30-member LAUNCH council that involves use of simple, accessible, affordable tests to assess water quality and safety. The council is a diverse and collaborative group of entrepreneurs, venture capitalists, scientists, engineers, and leaders in government, media, and business who will advise Sobsey and other presenters about how to move their innovations forward into commercial production, field deployment, and use.

Infectious Diseases

The infectious diseases epidemiology group in the Department of Epidemiology at UNC's school of public

health has particular strengths in human immunodeficiency virus (HIV) and acquired immunodeficiency syndrome (AIDS) research worldwide. Infectious diseases epidemiologists work to improve surveillance, identify newly emerging infections, understand transmission dynamics, and develop and evaluate prevention and control strategies.

Infectious diseases experts from public health and medicine programs at UNC-Chapel Hill are addressing the HIV epidemic through research and clinical treatment via projects underway in North Carolina and in regions such as Africa and Asia. In 2005, UNC-Chapel Hill researchers published a groundbreaking article that demonstrated a new method to rapidly diagnose acute HIV infection among HIV-positive individuals living in North Carolina [6]. Identification of HIV infection at the acute stage is key because HIV transmission is most likely during this period. This new test was then assessed for efficacy in Lilongwe, Malawi, and it is currently being adapted for use in sub-Saharan Africa [7].

The UNC Project-Malawi, based in the capital city of Lilongwe, has a mission to "identify innovative, culturally acceptable and relatively inexpensive methods of reducing the risk of HIV and [sexually transmitted disease] transmission through research; strengthen the local research capacity through training and technology transfers; and to improve patient care for people living with HIV and AIDS" [8]. Faculty from the UNC School of Medicine and UNC's school of public health address issues ranging from mother-to-child transmission of HIV to HIV transmission as it relates to nutrition and breastfeeding.

HIV infection in North Carolina's African American population. Disparities in the prevalence of HIV infection and AIDS in the United States are well-known and well-documented. Ada Adimora, an associate professor of medicine who has an adjunct appointment in the Department of Epidemiology at UNC's school of public health, participated in a 2009 meeting at the White House with the Office of National AIDS Policy and the Council on Women and Girls that addressed the disparate rates of HIV infection and AIDS among the African-American population in the United States. Her research focuses on heterosexual transmission of HIV in the African American population in North Carolina and the southeastern United States.

In a recently published article, Adimora and colleagues cited Centers for Disease Control and Prevention (CDC) data estimating "that 45% of new HIV infections in the US in 2006 occurred among non-Hispanic blacks" [9p468], which greatly exceeded the incidence of transmission among whites in the United States during that period. Adimora recognizes that the lack of a preventive approach to the HIV epidemic in the United States has contributed to the disparities in the burden of HIV infection across racial lines. "The reasons for the nation's failure to control the epidemic among African Americans include the prevailing paradigm for HIV research and prevention" [9p470], which does not address relevant social factors. The research agenda for

the African American population with regard to infections due to HIV and other sexually transmitted pathogens must be “placed within a social determinants and social justice framework” [10p338], according to Adimora and colleagues, to approach prevention in a more integrated manner that includes upstream issues such as education and housing.

Severe acute respiratory syndrome (SARS). The 2003 SARS epidemic is a dramatic example of why global health is also local health. The epidemic spread rapidly from Asia to areas around the globe, primarily because of transcontinental airline travel, and almost 800 individuals died from the infection [11]. Ralph Baric, professor of epidemiology, had for years conducted research on the *Coronavirus* genus, of which the virus that causes SARS is a member. He and his research team synthetically reconstructed the bat variant of the virus for the purpose of developing a vaccine for the virus [12]. The only US case of SARS, contracted by a UNC employee who had traveled to Canada, was treated at UNC Hospitals.

Global Obesity

It is widely recognized that the United States is experiencing a rapidly expanding epidemic of obesity and associated chronic diseases [13]. The North Carolina Division of Public Health reported that, in 2007, the prevalence of obesity among North Carolina children was the fifth highest in the country, with 20% of children aged 10-17 years overweight and 14% obese [14]. In the same year, more than 64% of adults in North Carolina were overweight or obese. It is now also clear that what is being seen in North Carolina is part of an obesity pandemic, with high obesity rates documented in China, India, Brazil, Mexico, and many other developing and transitional economy countries. Research at UNC-Chapel Hill has tracked diet and obesity trends around the world over the past 2 decades [15]. Barry Popkin, professor of nutrition and leader of the Interdisciplinary Obesity Research Center at UNC-Chapel Hill, recently published a book for laypersons that describes the causes and possible solutions to address the problem [16]. More than 65 UNC-Chapel Hill faculty members work on obesity and diabetes research and prevention across the state and around the world. Projects cover the life span and involve tracking of obesity during infancy among African American families [17, 18], among children aged 3-5 years in day care [19], among adolescents with type II diabetes in North Carolina and the United States [20], and among adult women in rural North Carolina settings who are at high risk for obesity and diabetes [21, 22].

Community Preparedness

North Carolina partnerships with Moldova and Botswana. The National Guard State Partnership Program links US states with partner countries. This program represents “an evolving international affairs mission for the North Carolina National Guard using the unique civil-military nature of the Guard” [23]. Activities in the program include bilateral consultations, civic leader visits, and medical and humanitarian

exchanges. The North Carolina-Moldova partnership was formalized on April 22, 1999; the North Carolina-Botswana partnership was formalized in February 2008.

Bill Gentry, director of the Community Preparedness and Disaster Management program in the Department of Health Policy and Management at UNC’s school of public health, accompanied the North Carolina National Guard on a mission to Moldova to promote regional cooperation and interoperability between nations in the Black Sea region. Gentry has played a vital role in this local-global link through his efforts to help facilitate and evaluate a multinational disaster-awareness exercise that included participants from Moldova, Ukraine, Romania, Azerbaijan, Bulgaria, Georgia, Armenia, and Turkey. Gentry recently began working on the new state partnership with Botswana, traveling there in March 2010 for a training event with the Botswana Defense Forces.

Public health preparedness in North Carolina and worldwide. The CDC-funded UNC Center for Public Health Preparedness, based at the North Carolina Institute for Public Health, is part of a national network of centers with the mission to improve the capacity of public health agencies and their staff through research, educational programs, and technical assistance. The center works primarily with US-based agencies. Staff members have also consulted on projects around the world, including a program in Southeast Asia to train influenza rapid-response teams, courses and modules on field epidemiology in Central America, and influenza surveillance in Europe, the Middle East, and Africa.

Microfinance and Health

An innovative study called Seeds of Hope is underway in eastern North Carolina to adapt global models of microfinance [24] to improve the health and economic status of women. Seeds of Hope arose from associations UNC-Chapel Hill researchers have had with women in Duplin and Sampson counties in North Carolina since the early 1990s. Led by Marci Campbell, professor of nutrition at UNC’s school of public health, the first objective of Seeds of Hope was to help women start a business that “that will serve as a laboratory for women to learn and practice the entire constellation of skills required for planning and running a business and to develop a business plan for a socially responsible, sustainable, and healthy woman-run small business in Duplin and Sampson Counties” [25p1123]. The business the women developed is called Threads of Hope, and it uses skills they gained through employment in the textile industry before textile companies moved their production facilities overseas. This approach of linking business skills with health education “embodies the belief that if women have economically sustainable work, are paid a living wage, and have more control over their lives economically, their health will improve” [25p1123].

There is additional work being done by faculty at UNC’s school of public health that looks at international examples of how microfinance can improve the health of participants.

The Gillings' gift to the school of public health supports 2 Gillings Innovation Labs on microfinance, including one that funds research by Suzanne Maman in the Department of Health Behavior and Health Education that analyzes the role microfinance and leadership training can have on men, especially young men who are most vulnerable to contracting or spreading HIV [26].

Conclusion

UNC-Chapel Hill has a long tradition of involvement in global health projects, beginning with work undertaken by

public health researchers in the 1950s in water and sanitation and including a 20-year history of infectious diseases work in multiple countries, as well as local and global research in nutrition and obesity. Because of the interconnectedness of national and international health concerns, health care education, whether in medicine, public health, pharmacy, or nursing, should incorporate global perspectives and interdisciplinary approaches to ensure that practitioners understand the implications of living and working in a global community [27]. Indeed, global health is public health, and global health is local health. **NCMJ**

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