



*PREVENTING*  
**DISEASE,**

*IMPROVING*  
**LIVES**

*Preventive medicine dreams of a time when there shall be enough for all, and everyone shall bear his share of labor in accordance with his ability, and everyone shall possess sufficient for the needs of his body and the demands of health. These things shall all have as a matter of justice and not of charity.*

*Preventive medicine dreams of a time when there shall be no unnecessary suffering and no premature deaths; when the welfare of the people shall be our highest concern; when humanity and mercy shall replace greed and selfishness; and it dreams that all these things will be accomplished through human wisdom.*

*Preventive medicine dreams of these things, not with the hope that we, individually, may participate in them, but with the joy that we may aid in their coming to those who shall live after us. When the young have vision, the dreams of their elders come true.*

—DR. MILTON ROSENAU



For 75 years, the Gillings School of Global Public Health has been at the vanguard of research, education and in-the-field development of models to prevent and treat disease. Achievements by faculty members and students, often in collaboration with researchers from other UNC health affairs schools (medicine, dentistry, pharmacy and nursing) and colleagues elsewhere, have changed the practice of medicine, and more importantly, have changed the general public's health and lifestyle practices.

The School's commitment to interdisciplinary inquiry, broad partnerships and public engagement has made a powerful impact in communities throughout the world. By examining a few School initiatives—in infectious disease, obesity, cardiovascular health and cancer—it becomes clear how important the progression from academic research to implementation has been. The value of public health “book learning” at UNC, the people's University, is that discoveries are translated into workable solutions to improve health in North Carolina communities and in communities far, far beyond.

## INFECTIOUS DISEASE

Since the “father of preventive medicine” was founding dean of UNC's public health school, infectious disease is not a surprising focus for research at the School. Milton J. Rosenau, MD, an epidemiologist and self-described “disease detective,” was invited to UNC following his mandatory retirement as dean of Harvard's public health school, which Rosenau had founded as a collaboration between Harvard and the Massachusetts Institute of Technology.

One of the School's first major research projects in the early 1940s was aimed at controlling and eradicating venereal diseases. John Wright, MD, MPH, who headed the epidemiological study, adopted a number of innovative techniques in the project, including using computer technology to collect data, recording nurse-patient interviews to help train public health nurses, and developing filmstrips as an alternative instruction method for patients. Then, as now, the School was committed to understanding public health challenges and developing innovative ways to address them.

*Dr. John Larsh (right), then head of the Department of Parasitology and Laboratory Practice, confers with Polish researcher Dr. M. Stankiewicz about trichinosis research in this photo from the early 1970s.*



*Dr. Milton J. Rosenau*

Following World War II, the School helped extend the reach of public health services by training health educators at what was then called the North Carolina College for Negroes, now N.C. Central University, in Durham. In the segregated South, this was a progressive step and was due in large part to the dogged insistence

of Dr. Lucy Morgan. (See [tinyurl.com/UNC-SPH-timeline](http://tinyurl.com/UNC-SPH-timeline).)

“In public health, we’ve always believed in helping people and training people to get out there and do things, and you don’t do that by being very conservative,” said Dr. John Larsh, a parasitology expert who joined the faculty in 1943.

Today, the School continues its commitment to the prevention and treatment of infectious diseases among those with limited access to health services. The lab of Mark Sobsey, PhD, Kenan Distinguished Professor of environmental sciences and engineering, developed the compartment bag test, which makes water testing simpler and more accessible, thereby limiting human exposure to and negative health effects from disease-causing microbes.

School researchers have studied parasitic diseases, ranging from malaria—still endemic in the southern U.S. in the School’s early years—to HIV, a virus that emerged in the early 1980s. UNC has been a global leader in HIV/AIDS research for more than 20 years, having established a research site in Malawi in the early 1990s. (In 1993, among pregnant women in Malawi, the rate of HIV infection was about 30 percent; now the rate is less than 11 percent, but more than 1.1 million people still are HIV-positive.)

Myron Cohen, MD, Yeargan-Bate Eminent Distinguished Professor of Medicine, Microbiology and Immunology, and Epidemiology in the UNC schools of medicine and public



*Dr. Myron Cohen*

health, is an award-winning global leader who has conducted extensive research in AIDS prevention and treatment.

In fact, Cohen worked with David Savitz, PhD, then chair of the epidemiology department, in the early 2000s to increase dramatically the number of faculty members conducting infectious diseases

research. The intent was to leverage the strong infectious diseases and global health program at the medical school and make UNC a world leader in infectious diseases epidemiology.

One of the faculty members recruited then is Steven Meshnick, MD, PhD, epidemiology professor, who conducts malaria research in Malawi and elsewhere.

“With both malaria and HIV, we have been very active in trying to improve the treatment of people in developing

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*Dr. Steve Meshnick conducts research on malaria and HIV/AIDS in Malawi and elsewhere. He also makes an impact in N.C., where he studies tick-borne diseases.*



Photo by Linda Kestelman

*A photograph of a boy using Dr. Mark Sobsey's compartment bag test, a quick and reliable way to detect E. coli in drinking water, was featured on the cover of a 2014 USAID catalogue that described the year's best USAID-funded innovators.*



**USAID**  
FROM THE AMERICAN PEOPLE



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countries,” Meshnick says. “We are exploring behavioral approaches to improve the way that poor and relatively uneducated people cope with disease.”

Similarly, research by Annelies Van Rie, MD, PhD, associate professor of epidemiology, considers how to improve care for tuberculosis in developing countries.

Meshnick says that epidemiology is “a department that prides itself on doing applied research, work that will have an immediate impact on people.” His work closer to home, which examines tick-borne disease, is an example of this. (See [tinyurl.com/Meshnick-ticks](http://tinyurl.com/Meshnick-ticks).)

“Infectious diseases researchers at the School are working across the spectrum to prevent disease transmission,” says epidemiology professor Ralph Baric, PhD, “from outbreak investigation to diagnosis, vaccine design, interventional strategies, behavioral and environmental considerations, and virology.”

Faculty members and their teams examine many different pathogens, from basic science to the treatment of human disease, with major initiatives in malaria, HIV/AIDS and tuberculosis, as well as emerging infectious diseases such as noroviruses and coronaviruses. These studies will lead to the discovery of preventive measures and treatments in the not-so-distant future.

## OBESITY

Through cutting-edge research and innovative delivery systems, the Gillings School has led the way in combating obesity. With about two-thirds of adults and one-third of children in the United States overweight or obese, the School has undergone a dramatic shift over the past 35 years from focusing on the problem of malnutrition to confronting the alarming epidemic of obesity.

In the early years of the School, obesity might have been measured as part of other studies, but it was not addressed as a unique issue. That changed after leaders including Barry M. Popkin, PhD, W.R. Kenan Jr. Distinguished Professor, joined the school’s nutrition department in the late 1970s. Popkin’s conclusion that U.S. food and nutrition programs were causing obesity led to his heading a nutrition panel that was part of President Jimmy Carter’s Commission on Child Health.

Popkin’s “nutrition transition” concept, which explains how people’s diet and exercise patterns shift in accordance with changes in technology and society, has led to policy changes throughout the world.

“In the global obesity-prevention category, we are the lone leaders, working on large-scale efforts to create change,”

Popkin says. In 2000 and 2013, he convened two international conferences in Bellagio, Italy, “to bring people from dozens of low- and middle-income countries together to recognize the obesity problem and push forward on large-scale regulatory efforts.”

The author of *The World is Fat*, Popkin has worked closely with a number of governments throughout the world, particularly China and Mexico, on policies to reduce obesity, including taxes on sugar-sweetened beverages and front-of-package profiling to identify healthy foods.

Popkin is not the only current faculty member whose research is having an impact upon health policy. A study conducted by Penny Gordon-Larsen, PhD, nutrition professor, along with Popkin and Robert G. McMurray, PhD, Smith Gunter Distinguished Professor of nutrition, was instrumental in the passage in 2000 of the U.S.



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Physical Education for Progress Act. Efforts by Professor Dianne Ward, EdD, have focused upon preventing obesity in preschool children, including her development of the Nutrition and Physical Activity Self-Assessment for Child Care (NAP SACC), a program recently recommended by Michelle Obama's *Let's Move!* campaign as a way to combat obesity in child-care centers.

Like some of her colleagues, Gordon-Larsen—whose term as president-elect of The Obesity Society begins this November—works on all aspects of obesity, ranging from biological and genetic factors through the social and environmental factors that underlie it and its cardiometabolic consequences.

“Because we have such a range of expertise here at UNC, particularly relative to nutrition, we are able to work with faculty members from a number of disciplines to take advantage of the most cutting-edge methods to analyze data,” Gordon-Larsen says.

In addition to conducting innovative research, faculty members lead the way in disseminating solutions.

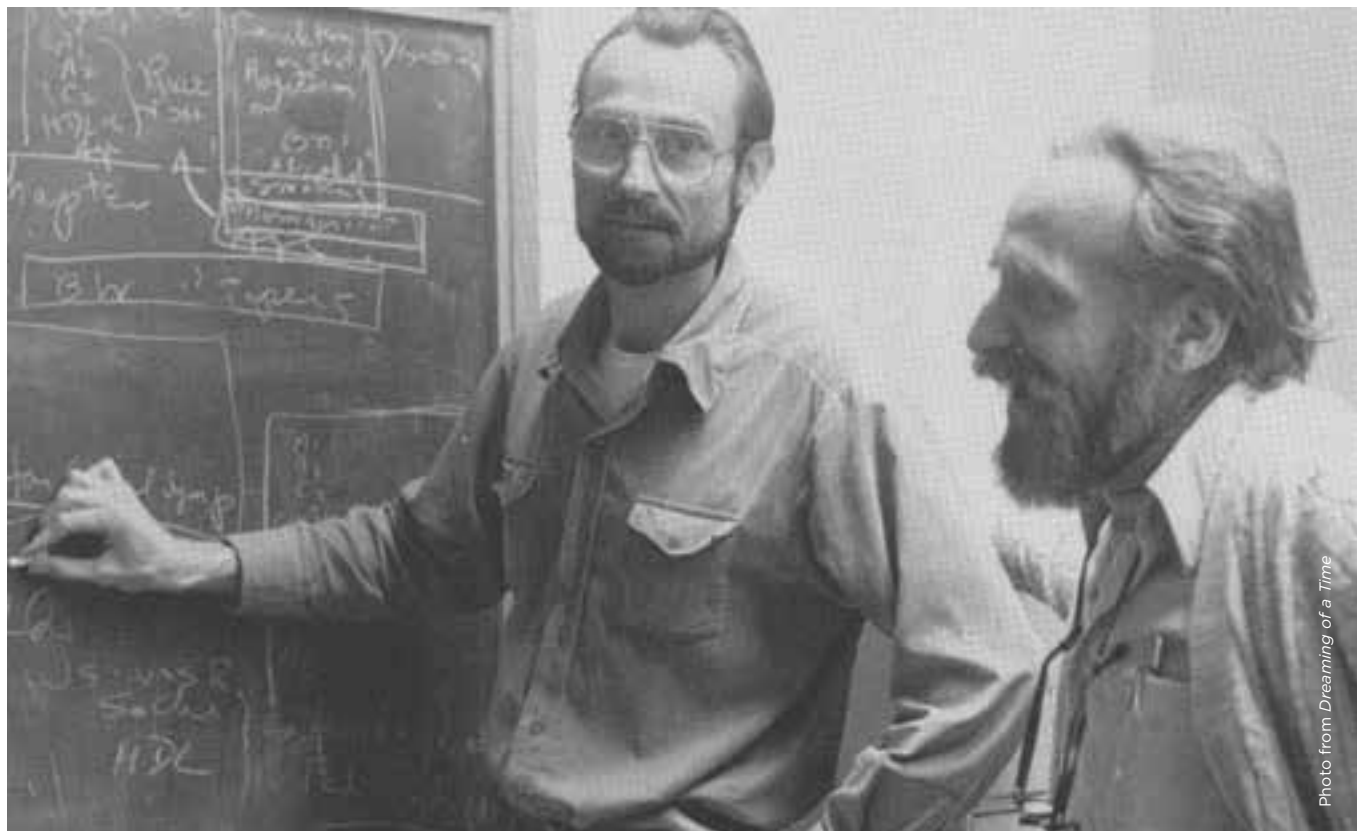
“My primary research interest is technology-enhanced dissemination of evidence-based prevention and treatment of obesity,” says Deborah Tate, PhD, associate professor of health behavior and nutrition. “My work makes obesity treatment and prevention programs more accessible and considers how to use technology to deliver treatments that are intensive but easier to access.”

Tate's 2001 and 2003 papers in the *Journal of the American Medical Association* were some of the earliest work on delivering Web-based behavioral treatment.

Similarly, a research team led by Alice Ammerman, DrPH, nutrition professor, initiated Food Explorers, a pilot social marketing campaign designed to promote healthy lunch menus and increased fruit and vegetable consumption in Rockingham County (N.C.) public schools.

## CARDIOVASCULAR DISEASE

When John Cassel, MD, became chair of the school's epidemiology department in 1958, he brought an innovative



A photo from the 1970s shows epidemiology professors Gerardo Heiss and the late H.A. Tyroler discussing a research problem.



approach built upon experience in his native South Africa. Cassel's understanding of the importance of social and cultural environments as a determinant of health helped shape his department and the public health school, as well as the field of epidemiology, both nationally and globally. Similarly, Bert Kaplan, PhD, professor emeritus of epidemiology, followed up on Cassel's efforts to bring attention to the social and cultural determinants of cardiovascular disease, providing foundational work in these dimensions of behavior and health.

In addition to the School's ongoing presence and engagement with cardiovascular disease research over many years, School researchers translated results to the communities in which they worked. Gerardo Heiss, MD, PhD, Kenan Distinguished Professor of epidemiology, says that the training component of the School has been critical.

"We have had grants to train scientists in cardiovascular health for 38 years, ongoing and uninterrupted," says Heiss. "The School has been training our scientists working in community, government and private industry, contributing to the work on cardiovascular disease."

Heiss names Herman Alfred (Al) Tyroler, MD, whose career at UNC spanned 40 years, and former dean Michel Ibrahim, MD, PhD, as outstanding mentors and teachers who contributed greatly to the training of many scientists who now have international renown.

"The School has a very strong and interdisciplinary presence in addressing, diagnosing, quantifying and finding solutions for cardiovascular health," Heiss says.

UNC's public health school played a critical role in one milestone related to prevention of cardiovascular disease, namely, when clear proof was provided that cholesterol consumption was a risk factor for heart and vascular problems. The Lipid Research Clinics Coronary Primary Prevention Trial (LRC-CPPT) was the first trial in this country—large in scope and long in duration—that showed reducing cholesterol prevents heart attacks and decreases risk of cardiovascular disease. UNC was the coordinating center for that trial, which included 12 clinics throughout the country.

Heiss says the study is a great example of the School's research being translated into actions that literally change

the practice of medicine. Discoveries from the cholesterol studies are considered to be among the greatest successes in the area of public health over the past 25 years.

"Unfortunately, lifestyle and social changes are now promoting other risk factors for cardiovascular disease," says Heiss. "This requires us to anticipate challenges that lie ahead and try to deal with them."

To that end, a host of faculty and student researchers study diverse causes of cardiovascular disease. Among them are June Stevens, PhD, AICR/WCRF Distinguished Professor of nutrition, who aims to uncover and define links between obesity and diabetes, cardiovascular disease and cancer, and Wayne Rosamond, PhD, epidemiology professor, whose expertise in monitoring cardiovascular disease in populations and temporal trends has led hospital networks to recognize strokes early and admit to the hospital patients experiencing strokes.

## CANCER

The School's focus on cancer covers the spectrum, from discovering risk factors to reducing occurrence and impact of cancer to disseminating findings and changing models of care.

The Carolina Breast Cancer Study (CBCS) is a landmark in understanding the biology of breast cancer and disparities in breast cancer occurrence and prognosis. Started in 1993 by UNC's Lineberger Comprehensive Cancer Center and the UNC School of Public Health, the study has sought to understand differences in the etiology and outcomes of breast cancer among African-American and white women.

This work carried on a tradition established by Barbara Sorenson Hulka, PhD, former chair of the epidemiology department, who was an early pioneer in using a biological approach to studying cancer. CBCS is significant not only for its findings but because it was one of the few early studies that enrolled sufficient numbers of African-American women, based on population.

"By tying together lab work with population data, CBCS showed that one reason African-American women have poor survival might be the fact that the biology of their tumors is different," says Andrew Olshan, PhD, Barbara Sorenson



Hulka Distinguished Professor in Cancer Epidemiology, current department chair and associate director for population sciences at UNC Lineberger. New molecular epidemiological investigations of breast cancer biology, using CBCS and other study resources, are led by Melissa Troester, PhD, associate professor of epidemiology and pathology.

The School has built upon the CBCS's infrastructure and design, which was developed by the late Robert Millikan, PhD, epidemiology professor, and UNC School of Medicine faculty members Drs. Shelley Earp, Lisa Carey and Charles Perou, to create North Carolina-based studies of other forms of cancer. Robert Sandler, MD, MPH, Nina and John Sessions Distinguished Professor of medicine and of epidemiology, studies colorectal cancer; Olshan conducts the Carolina Head and Neck Cancer Study; and Marilie Gammon, PhD, epidemiology professor, leads the Long Island Breast Cancer Study Project, a landmark investigation of possible environmental causes of breast cancer.

"Over time, we have taken study designs looking at etiology and included an outcomes phase for men and women with cancer," Olshan says. "We follow them over time and look at treatment, quality of life and survivorship. We have evolved our studies in a collaborative way to expand the research question beyond *causes* of cancer to cancer outcomes."

Outcomes research is a recent and important development that is a collaboration of the departments of health policy and management, epidemiology and oncology. With funding from the University Cancer Research Fund, a team from the schools of public health and medicine developed a novel cancer health-care claims resource, the Integrated Cancer Information and Surveillance System. This electronic cohort will examine individual cancer patient interactions with the health-care system and study the impact of co-morbid conditions and treatments so as to answer outcomes questions.

The School also has led the way in innovations in the delivery of health information. A stellar example is the North Carolina BEAUTY (Bringing Education and Understanding to You) and Health Project, led by Laura

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**—DR. GERARDO HEISS**

Linnan, ScD, health behavior professor. The program recruits and trains licensed hair stylists to serve as lay health advisers who offer cancer prevention messages to clients during salon appointments. These community-based strategies offer a gateway to ensure that those who suffer disproportionately high rates of disease and illness are reached.

Knowing that half of all premature cancer deaths can be prevented, School researchers focus on key risk factors including tobacco use, exposure to indoor tanning, sun exposure without protection, obesity and alcohol use. One such effort, which has the potential to reach the two million people in North Carolina and 46 million nationally who smoke, is better warning labels on cigarettes.

"Policy is effective because of its efficacy, reach and low cost," says Kurt M. Ribisl, PhD, health behavior professor and program leader in cancer prevention and control at UNC's Lineberger Comprehensive Cancer Center. Ribisl is particularly interested in using policy to change health behaviors.

The School's leadership in health policy is affirmed by President Barack Obama's 2011 appointment of Barbara K. Rimer, DrPH, dean and Alumni Distinguished Professor at the Gillings School, to chair the President's Cancer Panel. Rimer also serves as vice-chair of the Task Force on Community Preventive Services. She brings her expertise in health behaviors, cancer, population science and evidence-based public health to her role in shaping national cancer policy.

*—Michele Lynn*