

# Yale Public Health

SPRING 2009

Brain tumors, genomics  
and the quest for answers



Tracking 100,000 children  
Global health | Lyme cartography  
Assam odyssey | Chronicling abuse

Yale SCHOOL OF PUBLIC HEALTH





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SPRING 2009

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The early morning mist lifts from the surface of the Brahmaputra River in Assam, India. Photo by Gabriel Forrey

Yale SCHOOL OF PUBLIC HEALTH



## Dean's Message

### The promise of genomics

I am pleased to introduce *Yale Public Health*. This new magazine has been designed to showcase the many exciting initiatives that are underway at the Yale School of Public Health.

This magazine will contain items of interest to all members of YSPH and the broader community, highlighting the school's innovative research and its contributions to improving human health around the globe. The well-being of today's population, as well as that of future generations, drives our mission. In this inaugural issue we spotlight ongoing genomics research that could have a dramatic and lasting impact for all people.

Many people associate genomics with the development of medicines and treatment, but it is much more than that. Understanding how genes react to pollutants and other potential causes of disease, and how diseases develop, may spur breakthrough treatments and prevention strategies. For example, Elizabeth Claus' genomics research examines the cause(s) of meningioma, a poorly understood but common type of brain tumor that may be linked to specific hormones and/or exposure to certain types of radiation. The National Children's Study, whose study centers in Connecticut will be directed by Michael Bracken, will examine how gene-environment interactions may affect children's health. This national effort will track 100,000 children for 21 years. Another feature in this issue describes the recent discovery by Josephine Hoh of a gene

for age-related macular degeneration and her use of an innovative statistical technique to detect patterns in the genome. This genomewide association technique could lay the foundation for identifying genetic factors in many other diseases. One of our alumni, Peter Singer, discusses how genomics research can affect health throughout the world. In this issue, we also profile faculty members who are using this science to investigate topics as diverse as how disrupted circadian rhythms might cause disease and the link between health and educational success.

All of these stories illustrate our far-reaching capacity to investigate and address the causes of serious illness around the world. The School of Public Health has long recognized the potential of genomics and is positioned to use this emerging science to make important contributions to health. The coming years will be exciting ones.

Other YSPH faculty and alumni, meanwhile, are conducting research on numerous other vital topics, including cancer, vector-borne disease and HIV/AIDS. We look forward to bringing you this work and more in future issues of *Yale Public Health*.

Paul D. Cleary, PH.D.  
Dean, Yale School of Public Health

“The well-being of today's population, as well as that of future generations, drives our mission. In this inaugural issue we spotlight ongoing genomics research that could have a dramatic and lasting impact for all people.”



## Editor's Note

### Greetings and welcome to *Yale Public Health*

#### **Yale Public Health**

The Journal of the Yale School of Public Health  
Spring 2009, Vol. 1, No. 1

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*Yale Public Health* is distributed to alumni, faculty, students and friends of the Yale School of Public Health.

Abbreviations used in *Yale Public Health* include YSPH for Yale School of Public Health.

Cover art by Gianpaolo Pagni

#### **Printer**

Phoenix Press Inc.  
New Haven, Conn.



Printed on recycled paper with soy-based inks

Greetings and welcome to *Yale Public Health*, a new magazine of, about and for the Yale School of Public Health.

In this inaugural issue, and in each subsequent issue, we will highlight compelling public health issues – at the local, national and global levels. The magazine will explore these topics through a uniquely Yale spectrum, emphasizing the fundamental roles that YSPH alumni, faculty and students play in shaping and advancing today's public health agenda.

Every community needs a forum, a place to discuss, promote and celebrate the ideals that define it. As we move forward, I hope that you will consider this magazine such a forum. Among its roles, the magazine will be a means to connect with classmates, a platform for school news and a way to keep abreast of the issues that are at the forefront of public health today.

In this issue, we begin by looking at how the emerging science of genomics is being utilized in novel and exciting public health research, including Yale's significant role in the National Children's Study and the work of a researcher trying to pinpoint the origins of meningioma brain tumors. We also look at the creation of an online, first-of-its-kind, national Lyme disease map and at an upcoming international conference that seeks to facilitate far-reaching improvements in global health.

Good magazines are a work in progress. To give our readers what they need and expect, we need to hear from them. Please feel free to drop me a line with your observations or suggestions. If you have a story idea, a comment, a tip on a classmate or colleague conducting interesting and important work, please share it. Together we can make *Yale Public Health* a showcase in this dynamic field.

Since its founding by C.-E. A. Winslow almost a century ago, the school has grown tremendously. Many of the pressing public health concerns have changed, but the discipline remains as vital as ever. Today public health issues pervade nearly every aspect of life. It is an exciting, dynamic and evolving field, one that this magazine will seek to capture in each issue.

Enjoy *Yale Public Health*. It is your magazine.

Michael Greenwood  
*Managing Editor*



Gianni de Conno

### Peril in the air: Linking traffic pollution and infant health

An expectant mother who's sworn off smoking may still expose her baby to life-threatening toxins — every time she steps outdoors.

Researchers at the Yale School of Public Health and Yale's School of Forestry & Environmental Studies are testing the hypothesis that an expectant mother's exposure to vehicle-generated air pollution may increase her newborn's risk for low birth weight, preterm delivery and small-for-gestational-age birth — all major causes of infant mortality and morbidity.

Last year, the National Institutes of Health awarded a \$3 million grant to Kathleen D. Belanger, Ph.D. '85, research scientist in the division of Chronic Disease Epidemiology, and Michelle L. Bell, Ph.D., associate professor of environmental health at the School of Forestry & Environmental Studies, to gather data that may affirm this association. Each investigator brings her own expertise to the study:

Belanger is a perinatal epidemiologist, while Bell studies diseases that are caused by air pollution.

The study draws upon comprehensive data from four large studies of pregnant women in Connecticut and Massachusetts: occupation; smoking and alcohol habits; and prior pregnancy history, including vaginal versus Caesarian births. This level of detail will help control for all variables that might obfuscate the impact of pollution alone on birth outcome. The study also culls addresses from birth certificates filed in the two states over the same time, allowing access to a much broader data set to gird the study's statistical power. The next step is to construct "air pollution histories" for the women, plotting their addresses on a map that considers traffic volume, satellite imagery and weather patterns to gauge daily pollutant levels. "Previous studies assume you've lived in the same place throughout pregnancy," Belanger said. "Examining exposure by location — and by trimester — gives us a sharper look at its effects on pregnancy."

The researchers have observed an adverse effect of nitrogen dioxide and particulate matter on birth weight — a link most pronounced in African-Americans, who already face greater risk of preterm delivery and greater odds of living in inner cities, where air quality is generally poorer.

"When you're exposed to something as ubiquitous as air, it's difficult to see the effect unless you study it carefully," said Belanger, deputy director of Yale's Center for Perinatal, Pediatric and Environmental Epidemiology. Though the study is funded for five years, she anticipates initial results within three years.

Belanger describes her previous studies of the subject as "significant yet inconclusive," constrained by data that indicated county of birth only (and thus a mere estimate of air pollution), not the home addresses that would allow pinpointing of pollution levels by street location.

A key aim of the study is to assess the validity of using birth certificate data. "This allows us to have a sense of its accuracy and potential uses in other parts of the country," she said.

Last year, Belanger and Bell reviewed for the U.S. Environmental Protection Agency all studies relating particulate air pollution to adverse birth outcomes. If their study confirms the link, Belanger said "it will provide strong evidence for the need to consider lowering allowable levels of air pollution to protect the health of pregnant women and infants."

*Melissa Pheterson*

### Medical conversations are being lost in translation

It is a scenario that is increasingly familiar in America's hospitals and emergency rooms: doctors are confronted with patients who speak languages others than English.

Many physicians, it turns out, fail to use readily available interpreters with their non-English-speaking patients, opting for "getting by" with their own limited foreign-language skills or using a patient's friend or family member, according to research conducted in part by the Yale School of Public Health.

Reversing this pattern will require "substantial" changes in hospital practice that will have to target individual



physicians and the entire hospital practice environment, the study finds. Failure to use a qualified and professional interpreter in sensitive medical situations can lead to breaches in patient confidentiality and can compromise the quality of patient care.

"The study shows that there will be no easy fix, but clearly this is an important and widespread problem. When we think about quality, effective communication in the right language has to be part of it, but this is challenging in many settings, as the study shows," said Elizabeth H. Bradley, Ph.D. '96, professor in the division of Health Policy and Administration and a co-author of the paper.

According to the 2000 U.S. Census, the number of Americans with limited English proficiency grew by 53 percent between 1990 and 2000, to more than 22 million. These numbers are particularly concentrated in California, where 20 percent of residents had limited English proficiency. Research has shown that language barriers in patient care can lead to decreased access to preventive services, poor understanding of instructions and medications, longer hospital stays and an increased risk of medical errors and misdiagnoses.

The researchers conducted in-depth interviews with internal medicine residents from two urban teaching hospitals that are considered to have excellent interpreter services—one on the East Coast and the other on the West Coast. Although previous research has suggested that time constraints and lack of availability account for the underuse of interpreters among physicians, the study found that the reasons are far more

complex. Other reasons included the perception of "getting by," without major clinical consequences; lack of awareness of the limitations of using family members as interpreters; and the lack of professional consequences for this practice.

*Michael Greenwood*

## Heart attacks and depression linked

Heart attacks are traumatic, life-changing events. They are a grim reminder of one's mortality and often-times call for drastic lifestyle changes.

Even those fortunate enough to survive an attack are often left feeling vulnerable and despondent, an outlook that can further affect their already precarious physical health.

The problem is severe enough that a scientific advisory issued by the American Heart Association and co-authored by a Yale School of Public Health researcher is urging that heart attack survivors be screened—and if necessary, treated—for depression. The statement, the first of its kind on the link between heart disease and depression, has been endorsed by the American Psychiatric Association.

"By understanding the prevalence of depression and learning more about the subgroups of heart patients at particular risk for depression, we can begin to understand the best ways to recognize and treat it," said Judith H. Lichtman, M.P.H. '88, Ph.D. '96, co-chair of the statement and an associate professor in the division of Chronic Disease Epidemiology. "Depression and heart disease seem to be very much intertwined. You can't



treat the heart in isolation from the patient's mental health."

While there is no evidence that screening for depression leads to improved outcomes for people with cardiovascular problems, the advisory does state that depression is linked to increased morbidity and mortality, lower rates of cardiac rehabilitation and poorer quality of life. Depression is approximately three times more common in people with heart complications than in the general population, and as many as 20 percent of heart patients meet the criteria for major depression. Previous studies suggest that younger women who survive heart attacks may have a particularly high risk of depression.

Among the advisory's recommendations are that heart disease patients undergo routine and frequent screening for depression in a variety of settings, including the hospital, physician's office and cardiac rehabilitation center, and that patients with positive screening results be treated by a professional qualified to diagnose and manage treatment for depression.

*M.G.*



Michael Sloan (2)

### Ballots and boosters program goes nationwide

Voting is a civic duty. Getting vaccinated against the flu, in the eyes of most, is common sense.

Last November, the two familiar fall rituals were combined for the first time on a national scale. Flu vaccination clinics were set up within—or close to—select polling stations around the country.

The goal of the Vote & Vax program is simple: provide people, especially those who do not get out of the house very often, with a convenient and quick way to get vaccinated. One of the populations most at risk from influenza—those who are over 50 years old—is also the population most likely to vote (they make up nearly 70 percent of expected voters). Organizers hope that the grass-roots program will become a commonplace public health initiative in the future.

“It’s a way of providing an important public health service. This is entirely nonpolitical,” said Douglas Shenson, M.D., M.P.H., an associate clinical professor in the division of Chronic Disease Epidemiology, who organized the nationwide vaccination effort. The Vote & Vax program operated at 290 sites in 42 states on Election Day, including 11 clinics in Connecticut, and administered an estimated 20,000 shots.

“Vote & Vax is a public health strategy designed to better protect vulnerable Americans against influenza,” Shenson said. “During national elections, polling places offer an extraordinary public health opportunity to reach very large numbers of older adults on a single day early in the flu

season. More than 126 million adults will pass through the 186,000 polling places across the country—and by providing flu shots at polling sites we will reach many Americans who would not otherwise be vaccinated.”

The nonpartisan program was funded by the Robert Wood Johnson Foundation, a Princeton, N.J.-based philanthropy devoted to improving health and health care. The idea was initiated in 2006 as a pilot program that reached some 13,000 people.

Shenson said he wants to see the program grow in subsequent election cycles until it becomes a routine part of public health practice. The program received an excellence award in March from the National Influenza Vaccine Summit.

*Michael Greenwood*

### Drawn to the light (emitting diode)

Insects love light, but it turns out that they find some sources more appealing than others.

Standard incandescent bulbs have been used for decades by research scientists to lure insects into traps. Such collections are a standard part of fieldwork and have been critical to monitoring and studying vector-borne diseases such as malaria, West Nile virus and leishmaniasis.

While traditional bulbs work, solid-state lighting in the form of light emitting diodes (LEDs) appears to offer a range of advantages to insect-collecting researchers, including a higher yield.

Leonard E. Munstermann, Ph.D., a senior research scientist in the division

of Epidemiology of Microbial Diseases, replaced the standard incandescent bulbs found in insect traps with LEDs. Field tests in French Guiana and Colombia with the reconfigured traps captured up to 50 percent more of the sand flies responsible for the transmission of leishmaniasis.

“I’m going to use them for all of my work from now on. I’ll never go back,” said Munstermann.

The higher insect yield is explained by the precision wavelength emitted by LEDs. The emission can be accurately set to within a few nanometers. That means that an insect that is attracted to 400-nm light (a deep violet color that is on the far edge of the visible spectrum) can be enticed with bulbs that emit almost exclusively at 400 nm. The bulbs can easily be swapped if a longer or shorter wavelength is desired. By comparison, a standard incandescent white bulb emits light over a very broad spectrum (hundreds of nanometers). The majority of its energy is emitted as infrared radiation, an area of the spectrum that is invisible to most insects and ends up being wasted as heat. Pairing insects with specific wavelengths opens up a whole new area of research in entomology, Munstermann said.

*M.G.*





## Perspective

### Genomics, innovation and global public health—not strange bedfellows



Ontario Genomics Institute

## Emerging genomic technologies may offer a healthier future, but they will require scientific contributions from around the world.

By Peter A. Singer

Malaria is a global public health disaster, killing about a million people a year, most of them children under 5 years of age and living in Africa. Beyond the considerable death toll, malaria hinders development and contributes to poverty. Eradicating or, at least, controlling this disease would be a major public health accomplishment.

But what is the most effective way to deal with this epidemic?

- Indoor residual spraying
- Long-lasting-insecticide-impregnated bed nets
- Artemisinin combination therapy
- A malaria vaccine
- Genetically modified *Anopheles* mosquitoes that don't transmit malaria

As of now, only the first three options are available, and they form the mainstay of public health and treatment approaches to the disease. The last two may soon be available, illustrating the imminent and profound potential impact that genomics could have on improved global public health.

Although genomics has more technical definitions, my colleague Abdallah S. Daar and I use the term

interchangeably with biotechnology and life sciences. We think of it as a field that has been energized by the recent success of the Human Genome Project and the knowledge, tools and products it is spawning, resulting in vaccines, drugs and diagnostic tests.

Eighteen years ago, when I was a student at the Yale School of Public Health, there was little innovation in global health. Now, there is a lot. Although we have had disappointments in regard to the development of HIV vaccines, we may be on the verge of a malaria vaccine and we are nearing caged field trials of genetically modified mosquitoes. But if public health breakthroughs are to continue to happen, scientific innovation—no matter where it comes from—has to be encouraged, funded and utilized.

We are doing reasonably well tapping innovation in the industrialized world for global health. Major discovery programs have been launched, such as the Grand Challenges in Global Health initiative, which seek to achieve critical goals such as the creation of vaccines that do not need refrigeration or staple crops loaded with essential micronutrients. The development pipeline is strong, with more than 20 public-private partnerships, including the TB Alliance, the PATH Malaria Vaccine Initiative and Global Alliance for Improved Nutrition.

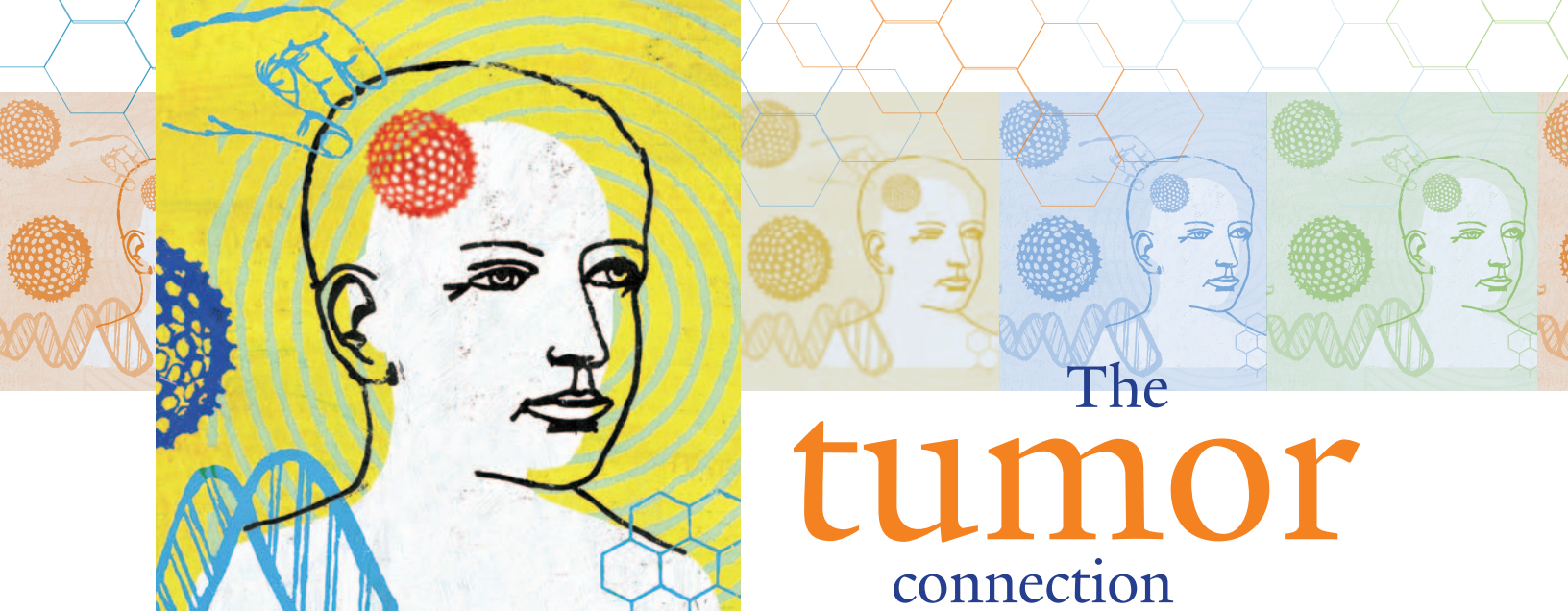
However, the global health community could better utilize innovation that is coming from emerging economies in places like India and China. In the 1990s, Shantha Biotechnics, based in Hyderabad, changed the recombinant process of hepatitis B vaccine

production from *E. coli* to yeast. This decreased the impurities in the production process, and because of lower labor costs in India at the time and domestic competition, Shantha was able to lower the cost of the vaccine from about \$15 to less than \$1. A Chinese company, Shanghai United Cell Biotechnology, has developed the world's only cholera vaccine in capsule form, which it sells for about \$10. The multinational price is about \$25.

In Ghana, Rwanda and Tanzania, our research team at the McLaughlin-Rotman Centre for Global Health has identified “stagnant technologies”—those that are developed by local scientists but never make it out of the lab because of the absence of venture capital and other aspects of commercialization. These countries could be supported to help them commercialize the findings of their domestic scientists and solve their own problems.

When I was at the School of Public Health, genomics was what people did across campus. Now it is how people create the future of public health. The way forward is to see innovation as a vital aspect of global public health and to tap it wherever in the world it occurs—especially if that's close to the public health problems we hope to solve.

*Peter A. Singer, M.D., M.P.H. '90, directs the McLaughlin-Rotman Centre for Global Health, University Health Network and University of Toronto.*



# The tumor connection

Ongoing research at Yale is investigating whether a mixture of genetic and environmental factors—hormones, radiation, possibly even cell phones—is contributing to meningiomas, the most common, though poorly understood, type of brain tumor. An emerging science may provide some answers.

By Michael Greenwood

Illustration by Gianpaolo Pagni

When Liz Holzemer was first informed about the “entity” that had taken root on the frontal region of her brain, she was alarmed, confused and, understandably, more than a little frightened.

A brain tumor?

She’d known something was wrong. Her mysterious physical symptoms could no longer be ignored or swept aside as exaggerations. A trip to Mexico was marred by headaches so penetrating that all Holzemer could do was lie motionless in a darkened room until the torture subsided.

Otherwise healthy, young and active, Holzemer wanted answers, and upon returning home to Colorado she insisted on an MRI to see what was afflicting her body and mind. It was a good thing she did. The black-and-white images revealed a grayish mass within her skull—54.04 millimeters from end to end and approaching the size of a baseball. Her doctor said she was close to slipping into a coma. Within days, Holzemer underwent emergency surgery and the tumor was removed.

In the surgery’s aftermath, Holzemer kept returning to one basic question. Where did this tumor—which was growing ever larger in the unyielding confines of her skull, incessantly pressing on the supple tissue of her brain and optic nerve—come from?

“It was devastating,” Holzemer said. “I thought, ‘How can this be? How can your brain harbor something that big?’ It astounded me.”

Her doctor in 2000 had few answers. There were some theories, speculation, but nothing definitive about the tumor’s origins or why Holzemer’s brain, in particular, had sprouted one.

Fast forward nine years and little has changed. Researchers are still struggling to isolate the cause, or causes, of meningioma, the most common form of intracranial tumor in the United States. Very little is known for certain. One small piece of positive news—if it can be described as such—is that meningiomas usually are not malignant, unlike gliomas. The bad news is that their side effects are often debilitating; their presence and growth can easily go unnoticed for years; and women are particularly susceptible.

Today, Holzemer counts herself lucky. Since the tumor’s removal, she had two children whom she refers to as her “miracles,” she feels pretty good most of the time (despite a few lingering deficits) and she has started a support group for fellow survivors and those recently diagnosed with the condition. But Holzemer lives with the prospect that a new tumor could appear like a phantom every time she goes for her annual brain scan. Even removed, a meningioma haunts survivors for a lifetime.

Holzemer, meanwhile, still has questions, and she has turned to a researcher at the Yale School of Public Health for some answers.





## Unknown origins

Elizabeth B. Claus, Ph.D. '88, M.D. '94, a professor in the division of Biostatistics, divides her time between Yale and Brigham and Women's Hospital in Boston, where she is a neurosurgeon.

During years in the operating room, Claus has removed meningiomas as large as tennis balls and as small as peas. Each tumor is gauged on a patient-by-patient basis, requiring Claus to make medical decisions that have profound implications for everyone involved. She is also a leading researcher in the field of brain tumors, currently investigating meningioma epidemiology and whether common environmental factors — things that most every person is exposed to in varying amounts — contribute to a tumor's formation or growth.

Meningiomas take their name from the meninges, the delicate membranes that envelop the brain and the central nervous system. The tumors can appear anywhere along these membranes, usually growing so slowly that years, even a decade, can quietly pass before the first symptoms surface. By the time pain and other abnormalities appear, a tumor may have matured into a sizeable growth. Symptoms vary widely, depending in large part on where the tumor is growing. Patients may experience headaches or vision problems. In some cases the tumor affects speech and motor control, and a tumor can even cause cognitive changes, resulting in atypical behaviors and memory loss.

For reasons that are still not well-understood, women are twice as likely as men to be diagnosed with meningiomas. And the risk increases with age. The tumors are rare in children and young adults. After that the incidence continues to increase, with the majority of tumors occurring between the ages of 40 and 70. In some cases patients develop multiple tumors at once.

The precise number of people with meningiomas in the United States is unknown, because until recently there was no system in place to track and catalog the incidence of the disease. That changed in 2004, when the U.S. Congress passed legislation requiring that benign tumors such as meningiomas be registered in a central database in much the same manner as cancer. It is estimated that some 138,000 people in the United States alone have the



Today, Holzemer counts herself lucky. Since the tumor's removal, she had two children whom she refers to as her “miracles,” she feels pretty good most of the time (despite a few lingering deficits) and she has started a support group for fellow survivors and those recently diagnosed with the condition. But Holzemer lives with the prospect that a new tumor could appear like a phantom every time she goes for her annual brain scan.

disease and that 11,000 new cases are diagnosed each year. Meningiomas account for more than 30 percent of all tumors that originate in the brain.

### Risk factors

The origins of meningiomas are not well-understood, but Claus has some educated guesses about the factors that might increase risk. Ionizing radiation is a prime suspect. Studies of cancer patients treated with radiation therapy to the head, especially at a young age, revealed up to a 10-fold increase in risk of meningioma. Of special interest to researchers is whether more common forms of radiation exposures—from sources such as dental X-rays and CT scans—may increase the risk. Preliminary evidence also suggests that certain hormones—the kind widely used in hormone replacement therapy, and perhaps in some types of oral contraception—may also play a role in either tumor initiation or growth, thus offering a potential explanation as to why so many more women have the condition. And then there are cell phones. Does the tiny amount of electromagnetic radiation released by the phones play a role? So far there is little evidence to support this association. But there have been very few studies that have specifically targeted cell phones and meningioma.

Claus and her research team are taking ambitious steps to find some answers. She is the lead investigator of the largest meningioma study (the Meningioma Consortium Study) ever conducted to investigate the genetic and environmental risk factors of the disease and to determine how the tumors affect quality of life.



Michael Marsland

Elizabeth Claus (seated), professor in the division of Biostatistics, is the lead researcher of a multiyear study on meningioma epidemiology that is investigating whether common environmental factors are contributing to the formation or growth of tumors. Other researchers involved in the project include (left to right): Van Duong, Estella Kanevsky, Elizabeth Kang, Dorothy Kwok, Lisa Calvocoressi (project director in Connecticut), Katherine Saunders (project director in Massachusetts) and Alison Green.

There have been few previous studies on the origins of meningioma, and they were limited to several hundred subjects, reducing the statistical power of the results. Claus' study, which is still actively enrolling subjects, is casting a much wider net. Her effort is currently in the first phase of a five-year, \$9.5-million investigation funded by the National Institutes of Health. She is collecting data on roughly 3,200 people, half of whom have been diagnosed and had surgery for a meningioma; the other half of the study population has never had the disease. Participants come from Connecticut, Massachusetts, North Carolina, the San Francisco Bay area and Harris County, Texas. The majority of the study participants are women.

Susan Lint of Massachusetts was the first patient to enroll in the study. Claus removed a meningioma from Lint's brain in 2006, and Lint willingly provided a DNA sample and a few hours of her time to answer questions the following year. She is grateful for the work done on her brain and curious about a disease that affected her so personally. "Why did I have this in the first place?" she asked.

Samples from other participants, meanwhile, continue to arrive in Claus' office in the Laboratory of Epidemiology and Public Health at 60 College St. Inside the padded envelopes are plastic containers that hold a sample of either blood, saliva or the tumor itself. These samples will be processed a few floors above in the laboratory of Herbert Yu, M.D., Ph.D., associate professor in the division of Chronic Disease Epidemiology, for future genetic analyses.



## Genomewide analysis

The process starts by extracting DNA from each of the samples, coding them to protect patient confidentiality and then storing. The DNA samples will eventually be analyzed using genomewide association, a new and powerful tool in the epidemiologist's arsenal that can help identify genetic variants that occur more frequently in people with the disease than in those without. The hope is that this analysis will lead to the genes that are associated with meningioma risk.

A study of this scope would have been prohibitive just a few years ago. The technology was such that even a limited survey of some of the approximately 25,000 genes in human DNA, accompanied by 3.3 billion base pairs, was labor- and time-intensive. There was no efficient method to process so much data. The burdensome nature of such work started to change in 2003 with the completion of the Human Genome Project. The pace of genomewide analysis further accelerated with the advent of a high-throughput screening technique that allows hundreds of thousands of genes to be surveyed relatively quickly and inexpensively. While 99 percent of genes are identical from one person to another, there are also millions of variations, known as single nucleotide polymorphisms, or SNPs (pronounced "snips"), between any two people. If researchers can find a recurring mutation pattern in the SNPs of their study group, they will be an important step closer to identifying the gene, or genes, responsible for meningioma.

"Laboratory and statistical techniques developed to analyze such data are changing rapidly; it is an incredibly exciting time to be taking on such work," Claus said.

Liz Holzemer was diagnosed with a meningioma in 2000 and underwent emergency surgery. Her tumor measured 54.04 mm in diameter and was approaching the size of a baseball.



In addition to examining genetic and environmental risk factors separately, the study also will attempt to examine combinations of genetic and environmental factors (interactions). Genetic variant data will be matched against the interview data that are being collected from each of the participants. Claus knows, for example, that Lint used contraceptives decades ago (even the type), that she has a second cousin on her father's side who also had a brain tumor believed to be a meningioma, and that Lint is a regular cell phone user (and what ear she uses when speaking). Whether persons with certain genetic variants respond differently to environmental factors, such as X-rays, remains to be seen. And then there is family. It is likely that a gene for the tumor—in some cases—is handed down from one generation to the next. Some previous research has supported this genetic predisposition, particularly in families with the neurofibromatosis 2 gene located on chromosome 22q. Claus' study will enroll families in which at least two people have been diagnosed with meningioma as an additional means to define genes associated with the disease.

But it appears that these relatively rare genes account for only a small percentage of meningiomas. It is believed that most tumors arise from a combination of genetic and environmental factors, and the population-based portion of the study is where the thrust of the consortium's research is focused. The consortium comprises investigators from five academic institutions: Joseph L. Wiemels, Ph.D., and Margaret R. Wrensch, M.P.H., Ph.D., both



of the University of California, San Francisco; Joellen M. Schildkraut, M.P.H. '82, Ph.D. '87, of Duke University; Melissa L. Bondy, Ph.D., of the University of Texas M.D. Anderson Cancer Center; Peter M. Black, M.D., Ph.D., of Brigham and Women's Hospital; and Lisa Calvocoressi, Ph.D. '03, and Yu, both of Yale.

Beyond the current study, Claus is already working to secure additional funding for the genetic component. One funding source, Holzemer's support group, Meningioma Mommas, continues to raise money for meningioma research and has donated \$85,000 to Claus' work to date.

As Claus has done with risk models for breast cancer, she hopes that her latest work will eventually be used to identify people at higher risk for brain tumors, providing

an early warning that allows time to alter certain behaviors or exposures, thus lessening the chance of developing a meningioma. Such findings could spare others from experiencing what Holzemer and Lint have had to endure. And they could finally provide the answers that the two women, and thousands of other meningioma survivors, are seeking.

"One of the most satisfying aspects of my work is the opportunity to meet and work with people like Liz Holzemer and Susan Lint," Claus said. "Their enthusiasm and support spur us on, and their questions help to inform and shape our research direction. I couldn't ask for better collaborators." **YPH**

## The three layers of the meninges

Dura mater

Arachnoid

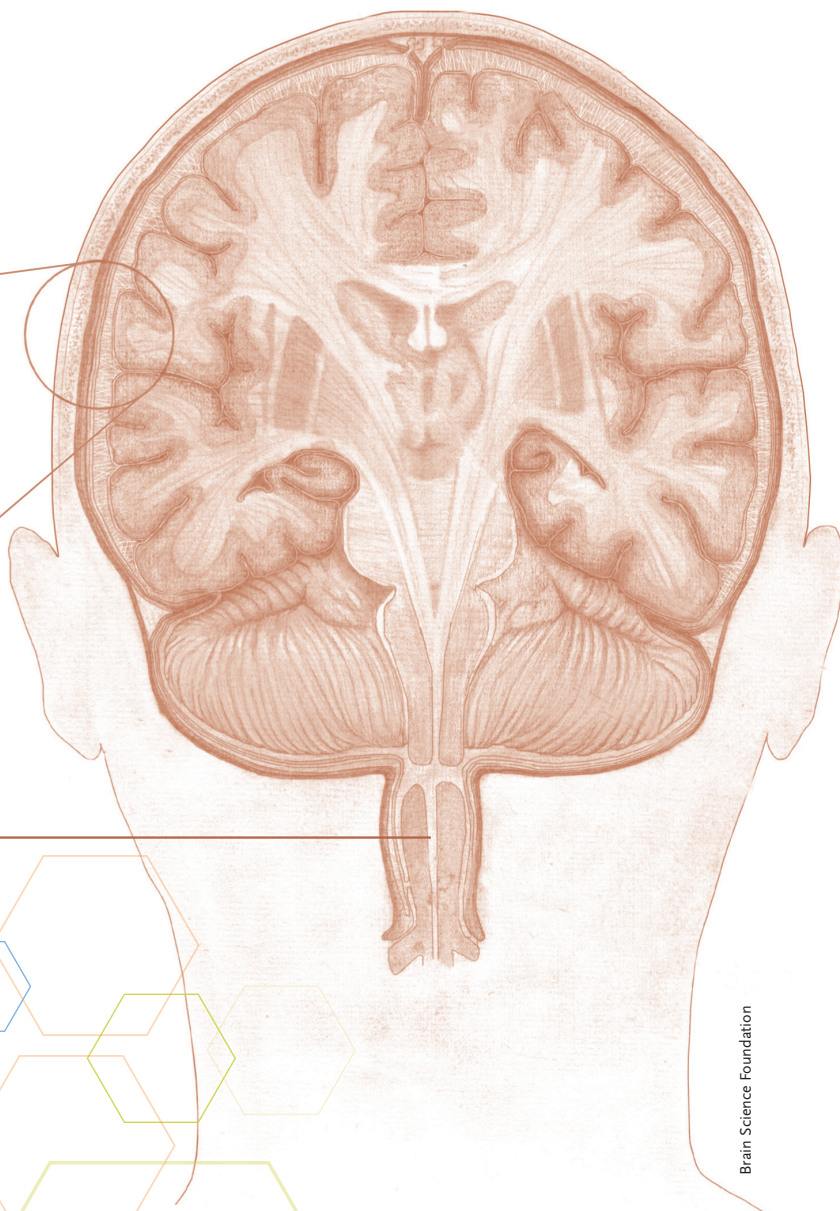
Pia mater

Skull

Brain tissue

Spinal cord

Meningioma tumors develop from the tissue that covers the brain and spinal cord. This tissue, called the meninges, comprises three membrane layers: the dura mater, the arachnoid and the pia mater. The tumors can appear in different areas of the brain and spinal cord.





# Tracking

# 100,000 children

A mountain of data and potentially pioneering breakthroughs that could reshape the knowledge about children's health await researchers in an expansive, and expensive, national study that will last into the 2030s.

**By Jenny Blair**

When a baby is born too early, or when a child develops autism, parents and doctors struggle for answers. Could it have been prevented? Did the mother eat the wrong foods? Was the child exposed to something toxic? Or was the cause buried deep within the genes?

The causes of many childhood illnesses are still maddeningly elusive. But an unprecedented effort to reveal their origins has begun, with the launch of the most comprehensive study of American children's health ever undertaken: the National Children's Study (NCS).


Researchers across the nation are about to begin studying 100,000 children from before birth to age 21. They will examine a myriad of influences on the children's health, from genes to diet to upbringing, in order to better understand the causes of disease. Yale School of Public Health is one of 36 study centers involved in the nationwide effort, whose findings are expected to shape research, clinical guidelines and public health policy for generations to come. Yale alone received a total of \$26 million in grants

in 2007 to study hundreds of children in New Haven and Litchfield counties. Michael B. Bracken, M.P.H. '70, Ph.D. '74, the Susan Dwight Bliss Professor of Epidemiology and co-director of the Yale Center for Perinatal, Pediatric and Environmental Epidemiology (CPPEE), will head the Yale portion of the national study.

"It will be a huge challenge," said Bracken. "It's a properly sampled study, [and] it's ... perhaps the least biased study about risk factors for some of these really expensive diseases." Asthma, obesity and autism are among the many common childhood diseases to be studied.

For study subjects, the 21-year journey will begin with a knock on the door. Researchers will fan out over the two contiguous Connecticut counties—which were among 105 counties chosen as statistically representative by federal planners—to recruit eligible pregnant women, as well as some who are not yet pregnant. The goal will be to enroll 250 mother-baby pairs in each county per year for four years. With blood and urine samples, interviews,





examinations and home visits, a wide variety of environmental exposures will be measured, from cadmium levels in hair to pesticide levels in drinking water. Outcome measures will range from biochemical assays for cortisol levels in children's saliva to assessments of children's cognitive ability and attachment to parents. The result, said Kathleen D. Belanger, Ph.D. '85, deputy director of CPPEE and principal investigator of NCS' New Haven cohort of children, will be "an enormous database of information."

Along with all but a few centers doing pilot studies this year, the School of Public Health will begin amassing that database in mid-2010. The first published papers from NCS will follow within two to three years, with hundreds more to follow in the ensuing decades.

"It's a very expensive study," Bracken said. "But if it pays off in only a small number of diseases in terms of explaining and at some point allowing us to prevent these diseases, the cost benefit will definitely be there."

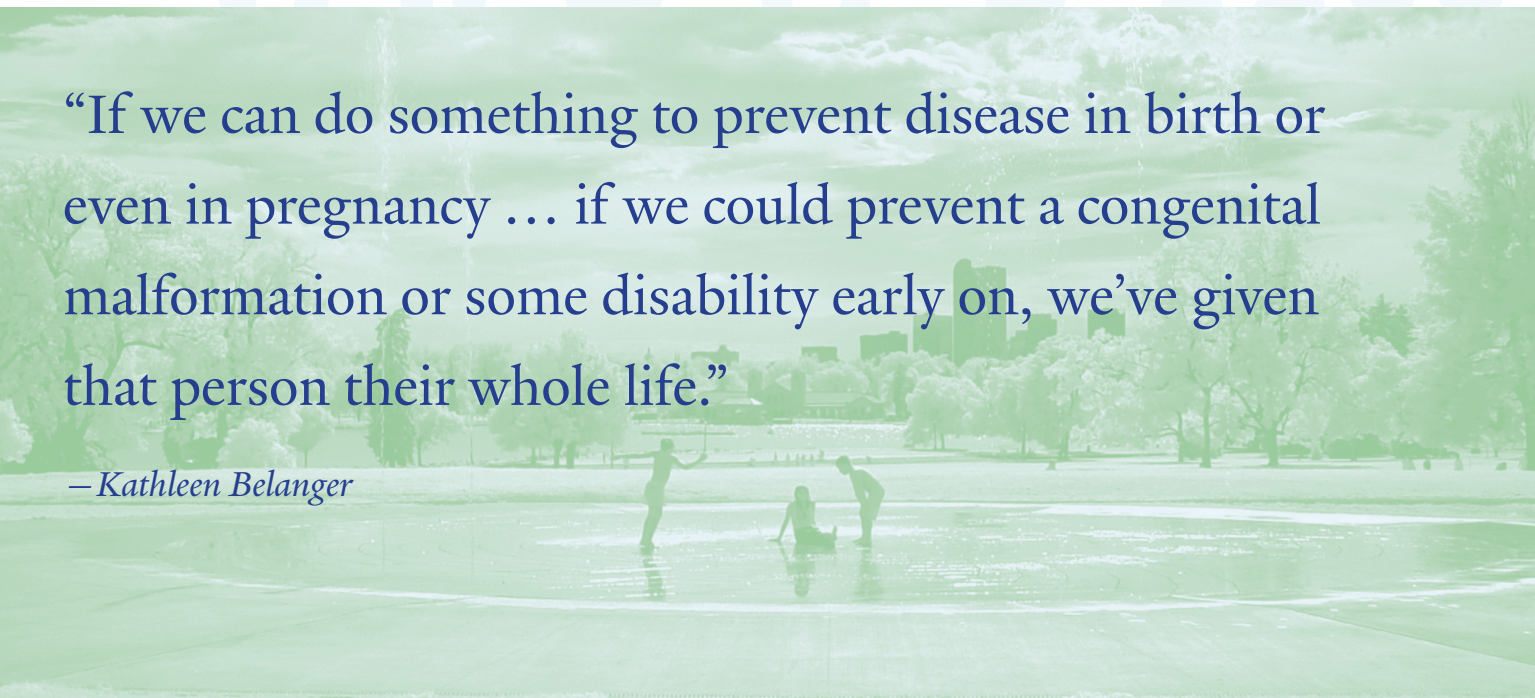
In addition to studying the environmental influences on children's health, NCS researchers will focus on genetic influences. The project's vast sample size and cohort design make it ideally suited to genetic research, and in particular to the study of gene-environment interactions. The researchers will examine DNA in blood samples with genomewide association scans, a technique pioneered in 2005 by Josephine Hoh, Ph.D., associate professor in the division of Chronic Disease Epidemiology. In each patient, researchers will locate up to 1,000,000 single nucleotide polymorphisms, or SNPs (pronounced "snips")—places where individual DNA bases vary from one person to another—and form a "bank" of SNP information. Knowing

which SNPs occur more frequently in people with a particular disease is important; SNPs' locations serve as clues to which genes are involved with a disease, since abnormal base pairs in or even near a gene can alter its activity. As biomedical research progresses and individual SNPs are linked to a particular disease, NCS researchers will be able to see whether children with a particular SNP develop the related disease and whether children with a particular disease are more likely to have the related SNP than children without the disease. In concert with the volumes of environmental data being collected in the study, SNP information will help researchers develop more precise estimates of a child's risk of developing a disease.

"To do those sorts of analyses you need lots and lots of people," said Bracken. "That's why this [sample size of] 100,000 is hopefully going to pay off."

Cohort studies on this scale are unusual, though not unprecedented. Since 1948, the Framingham Heart Study has followed thousands of adults in Massachusetts with biennial examinations to better understand the causes of cardiovascular disease and stroke. The first phase alone of the Nurses' Health Study has followed over 120,000 women. In pediatric research, the Collaborative Perinatal Project (CPP) of the 1960s followed 55,000 American children from birth to age 8. South Africa's Birth to Twenty study began following thousands of children in 1990 and is still going on today. Studies similar in scope to the NCS effort are currently under way in Britain, Norway and Denmark.

But the NCS, which was created in 2000 as part of the Children's Health Act, is the first American study to focus on children in such numbers and on such an ambitious time

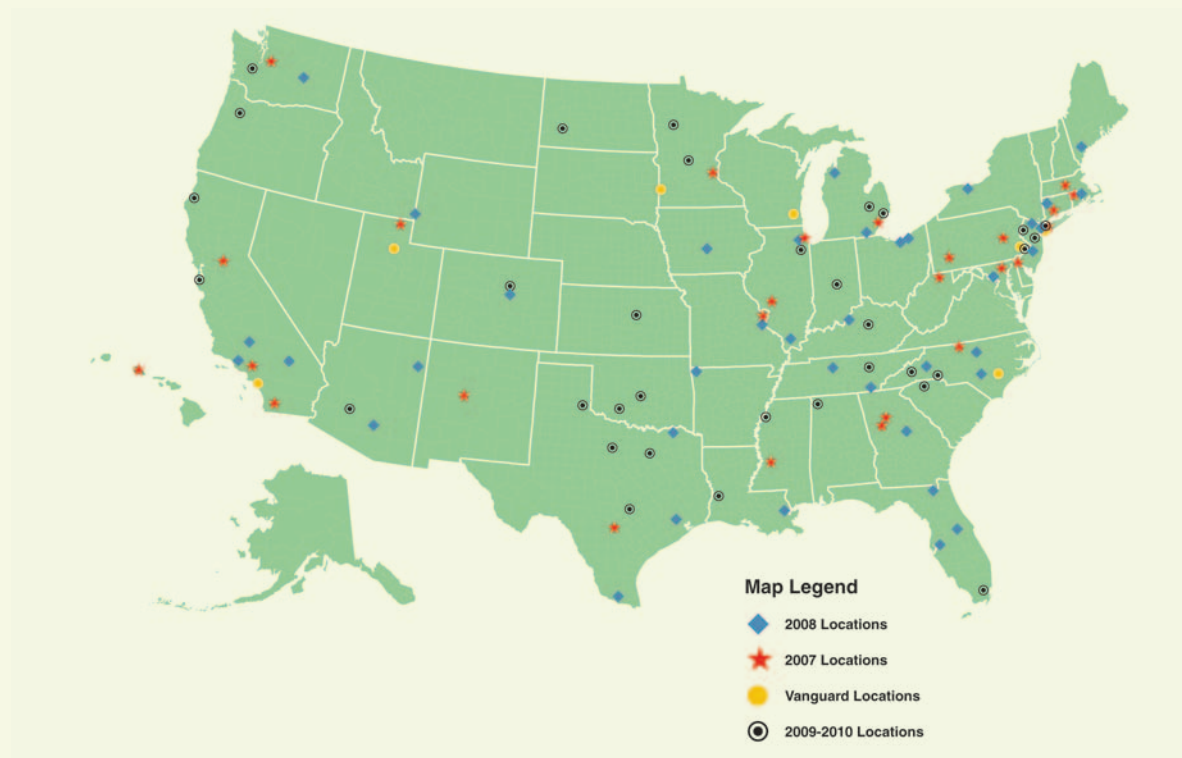


"If we can do something to prevent disease in birth or even in pregnancy ... if we could prevent a congenital malformation or some disability early on, we've given that person their whole life."

—Kathleen Belanger

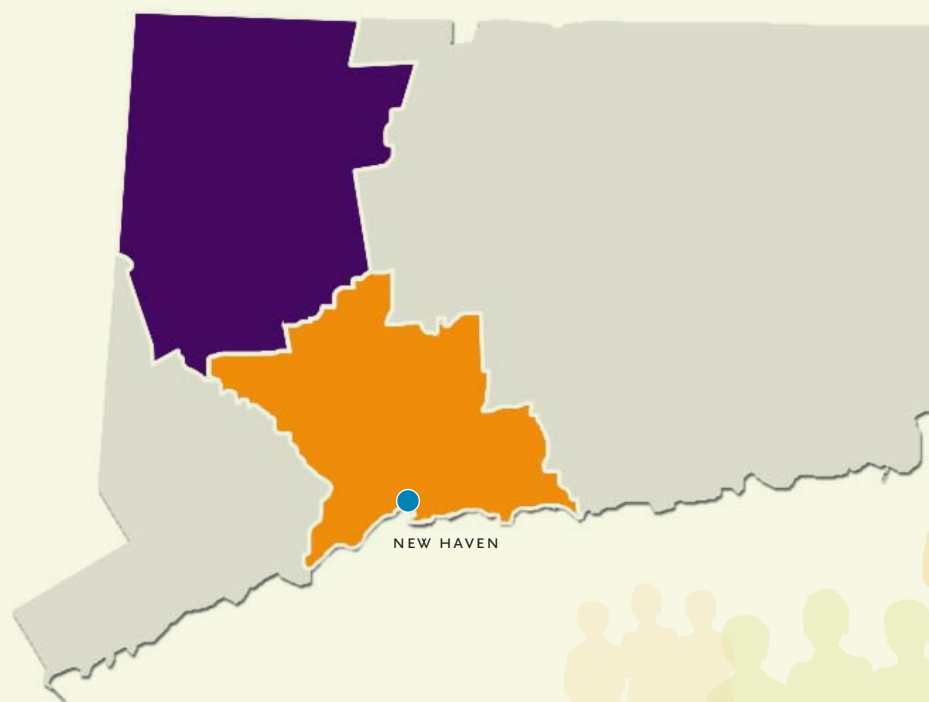


Study sites have been selected throughout the United States ...



A study of 100,000 children living in cities and small towns across the United States will track their development from before birth to 21 years of age to determine how environmental and other factors affect health.

... and Connecticut



Researchers at Yale will focus on Connecticut children living in New Haven (orange) and Litchfield (purple) counties.



scale. And the challenges in the United States are greater than in Scandinavia and Britain, because the American health care system is fragmented and lacks a central database. “America is not an easy place to do epidemiology,” said Bracken. “This is really the first attempt – after the CPP – to do this [in the United States and with children] in a systematic way.”

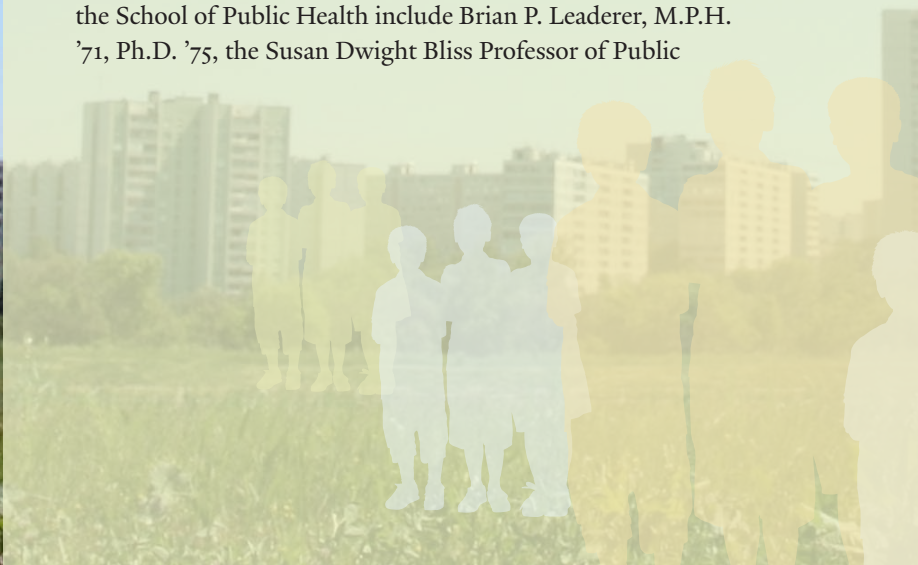
The need to build the type of information infrastructure that already exists in other countries is one of several difficulties facing NCS researchers. Recruitment is also expected to be challenging, particularly recruitment of women who aren’t yet pregnant.

“Basically, we’ll be knocking on doors,” said Bracken. “As you can imagine, that is not going to be easy.” To recruit from fertility clinics or physicians’ offices would be easier, but it would not generate a truly random sample of women. So the team plans to educate the public about the study months ahead of time by working with community groups and the local press.

Then, too, there will be dropouts. Twenty-one years’ worth of urine and blood sampling, interviews, developmental testing and questionnaires means that the burden on participants will be great. Though they will receive modest payments, that may not seem like enough for some people. “There’s going to have to be a cooperative relationship between the study centers, the people conducting the study and the participants in the study,” said Belanger. In part, that relationship will be maintained by community advisory boards that will be set up in each county to hear participants’ concerns.

But funding may be the researchers’ biggest headache. The project is paid for by a consortium of federal agencies, including the National Institutes of Health and the Environmental Protection Agency, and has cost \$2.7 billion so far. Its continuation will depend on repeated line-item budget approvals by Congress. But keeping such large studies funded over decades is not easy, and the recent economic crisis will likely make matters worse.

Yale’s portion of the study will be assisted by specialists from a number of fields, including Charles J. Lockwood, M.D., chair of the department of Obstetrics, Gynecology and Reproductive Sciences at the School of Medicine; Linda C. Mayes, M.D., the Arnold Gesell Professor of Child Psychiatry, Pediatrics, and Psychology in the Yale Child Study Center; and perinatologist Richard A. Ehrenkranz, M.D. Participating faculty members at the School of Public Health include Brian P. Leaderer, M.P.H. ’71, Ph.D. ’75, the Susan Dwight Bliss Professor of Public







Even a slight variation in DNA sequence can have a major impact on whether or not someone develops a disease and on their particular response to such environmental factors as bacteria, viruses and toxins. These variations also can affect reactions to drugs and other therapies. For example, one person might have the base A (adenine) where another might have C (cytosine). There are some 3 billion bases in the human genome.

Health; and Theodore R. Holford, Ph.D. '73, the Susan Dwight Bliss Professor of Epidemiology and Public Health. Other lead NCS investigators at the CPPEE include Jessica Illuzzi, M.D., assistant professor of obstetrics, gynecology, and reproductive sciences; and Lisbet Lundsberg, M.P.H. '92, Ph.D. '95, associate research scientist in epidemiology.

To both participants and lawmakers, researchers will continue to emphasize the NCS' tremendous leverage to change human health. A well-designed study of this magnitude can help countless people, as the Framingham and Nurses' Health studies have already done for adults with chronic diseases. But conducting research with such young participants only increases the benefits. That is why perinatal epidemiology is so important, said Belanger.

"If we can do something to prevent disease in birth or even in pregnancy ... if we could prevent a congenital malformation or some disability early on, we've given that person their whole life." YPH

*Jenny Blair, M.D. '04, is a physician and writer based in New Haven.*





## Probing the human genome for the origins of disease

**Yale's Josephine Hoh discusses her progress in identifying genetic biomarkers in common, complex illnesses.**

Josephine Hoh, Ph.D., associate professor in the division of Chronic Disease Epidemiology, is a relative newcomer to the Yale School of Public Health, but she has already earned critical acclaim from the international scientific community. In 2005, Hoh identified complement factor H (CFH) as an important risk factor for age-related macular degeneration (AMD), the leading cause of blindness in people over 50. This research was the first to demonstrate the power of the genomewide association (GWA) technique, which is remarkably effective in pinpointing the genes for complex human traits. Hoh's findings were subsequently honored by *Science* magazine as "one of the 10 most important scientific discoveries of the year." Others have since used this approach to make major breakthroughs in asthma, diabetes, cardiovascular diseases, cancer and obesity, among others.

### What did you do before coming to Yale?

**JH:** I received my bachelor of science degree in mathematics from the National Tsing Hua University in Taiwan. I went on to spend several years as a research and teaching assistant at Rutgers University and worked as a statistician in the pharmaceutical industry while pursuing my Ph.D. I followed this with a year as a postdoctoral fellow at Columbia University and then spent four years working in the laboratory of Jürg Ott at Rockefeller University. During my Rockefeller tenure, I learned a great deal about biology. In 2003, I joined the School of Public Health at Yale, where I am currently an associate professor. At Yale, I continue learning biology and like it more and more.



### Can you put your discovery of the AMD genes into perspective? Why hadn't this been done before?

**JH:** Actually, people did find several AMD-gene loci, as there had been numerous discoveries before our work, but efforts to pinpoint the specific gene were generally disappointing. Before the genomewide association technology was adopted, Professor Ott and I wrote a paper proposing that in the future this approach would be a more powerful way to identify the specific genes involved in complex diseases. Nevertheless, when the technology appeared imminent, I applied to a number of agencies for funding – and I was turned down for research support multiple times by the National Institutes of Health and others for having ideas that were “overambitious” and “not achievable.”

But I persevered anyway and carried out the work with the support of a private foundation. I thought, “if it did not work, it did not work; it wouldn't be the end of the world.” Yale gave me the complete freedom to take that risk. People were supportive by not making you feel that you were doing something crazy. In the end, it's what we have learned in economics – “high risks can bring the high returns.” And after finding the CFH variant, Yale collaborators encouraged me to take another risk, and I adapted our GWA approach to a cross-ethnic design and discovered the second major genetic variation that may cause wet AMD. I learned from ophthalmologists that Asians have a lot of AMD. Whereas Caucasians most commonly get dry AMD, Asians most frequently have wet AMD. We discovered the second gene in Asians, but then we proved it was related to Caucasian AMD as well.

### What is your major long-term goal for the future, and how close are you to achieving it?

**JH:** I'm now putting together the team to explain how and why the CFH and LOC/HTRA1 genes cause AMD and the particular pathologic features and progression of this most common cause of blindness. I believe that this understanding will ultimately prevent and possibly cure

“I asked the 12 students who enrolled in my first class of the fall semester why they wanted to take my course on chronic disease genetics and genomics. Their answer was unanimous: ‘Genetics is the future!’”

—Josephine Hoh

AMD, although we still have a long way to go to achieve that goal. However, it was very gratifying for me to see that in less than a year after the CFH publication, extensive efforts were in process to exploit this discovery and insight and to invent treatments for AMD.

**What other diseases do you plan to investigate with the GWA method?**

**JH:** My research method is amenable to any and all diseases that have a risk component in our genetic endowment. We are collaborating with experts on various diseases, including childhood asthma [with Michael Bracken’s team at Yale] and scleroderma, with a team at Imperial College London. Fortunately, the basic GWA method has become efficient and relatively less expensive than before, so money is the secondary, not principal, obstacle. What limits what I can do is availability of properly consented and organized DNA collections that have been clinically very well-defined. There are libraries of DNA that exist, but often they are “owned” by people who don’t have the knowledge and/or the funding to explore the genetics, and those who have the skills don’t have access to the materials.

**You’ve called the genomewide association method a “simple, elegant” technique. Describe in general terms what you came up with and how it works.**

**JH:** The key to the technique known as genomewide association mapping is the natural variability in the 3 billion “letters” in the human genome, the genetic instruction book that encodes all the proteins in the body. Humans differ in genetic makeup by only 0.1 percent, but that small part of the genome contains the key differences that can determine a person’s susceptibility to disease. Compare the genomes of a large group of people and you’ll find single-letter differences at about one in every 1,300 letters. In all, there are more than 10 million sites sprinkled throughout the human genome where common variations occur. Most of these variations, which are known as single nucleotide polymorphisms, or SNPs (pronounced “snips”), have no relevance to health. But some SNPs may influence and even determine one’s risk of developing a particular disease.

To effectively scan the SNPs in the entire genomes of large groups of people, however, one must compare hundreds of thousands of variations, which would have been impossible

until recently. Our AMD whole-genome analysis combined the SNP information compiled in public databases along with advanced biotechnology—silicon or plastic chips called microarrays that are coated with hundreds of thousands of precisely arranged microscopic fragments of DNA containing SNPs. The microarray we first used allowed us to rapidly compare the genomes of more than 100 people with or without AMD for 100,000 different SNPs. Now, we are using the chips containing 500,000 to over a million SNPs.

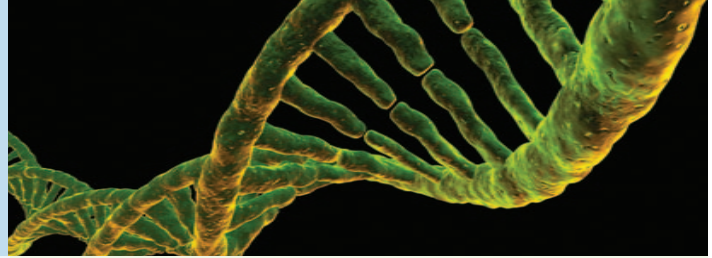
**How will genomics change the future of public health and the way it is practiced? How has epidemiology changed in the time you’ve been at Yale?**

**JH:** I asked the 12 students who enrolled in my first class of the fall semester why they wanted to take my course on chronic disease genetics and genomics. Their answer was unanimous: “Genetics is the future!” Just a decade ago, finding genes that contributed to human diseases was exceptionally labor-intensive, time-consuming and prohibitively expensive. But today, cutting-edge research is changing all that, with technology advancements and information flow becoming available at the speed of light. Now epidemiologists can easily explore the causes of disease from both genetic and environmental angles.

**You spend a lot of time in the lab and have said that your recent successes will require you to work even harder to realize the full potential of this science. In the time that you do have for yourself, what are your pursuits?**

**JH:** I could read and read, without stopping, financial analyses and market reports, mainly from the *Financial Times*. This hobby occupies a lot of my time. I have been fascinated by economic theories—long before the current credit crunch! I think that I can become a good epidemiologist if I work hard; however, to be an economist one really has to be a genius, which is not in my genes.

*Michael Greenwood*



### Genomics provides insights into the link between health and academic performance

Siblings may share the same parents, but they can inherit vastly different genes, predisposing one to good health and the others to challenges such as obesity, depression and attention deficit/hyperactivity disorder (ADHD).

Jason M. Fletcher, Ph.D., assistant professor in the division of Health Policy and Administration, is using this “luck” of the genetic draw in a unique research approach that measures the connection between a child’s health and his/her educational performance over time.

His data set includes information on genetic markers that have been shown to predispose children to poor health outcomes. Fletcher then makes statistical comparisons among siblings with the same biological parents, who therefore have an equal chance of receiving a certain set of genes.

“The genetic aspects of my research allow me to produce better estimates of the relationship between important socioeconomic outcomes, such as health and education,” he said. “My research also brings together insights from the biological and social sciences to expand knowledge of the determinants of health and other life outcomes.”

In typical medical trials, study subjects are randomly selected to either receive or not receive treatment. In Fletcher’s study, the “treatment” group consists of siblings who inherit a particular genetic makeup from their parents; the “control” group consists of their brothers and sisters who inherit a different genetic makeup. This approach allows researchers to use this randomization of genetic makeup among siblings to attempt to statistically link poor health with poor education outcomes.

“Since each sibling has an equal chance of receiving the ‘treatment’ or ‘control,’ we call this the ‘genetic lottery,’” Fletcher said. This approach has provided convincing statistical evidence that certain health issues correlate with poorer educational performance.

Fletcher found, for instance, that children with inattentive symptoms – the AD in ADHD – score substantially lower on standardized high school tests. There is also evidence that depression leads to lower test results. Obesity, meanwhile, does not seem to affect academic outcomes.

Fletcher said the findings provide evidence that improving a child’s health will likely improve educational outcomes and that poor childhood health can have long-term consequences in areas such as educational achievement.

### Do clocks matter in human cancers? Research shows they might

Almost all life has adapted to the alternating pattern of night followed by day.

This naturally occurring circadian rhythm affects nearly every biological pathway. But it can be disrupted with electric light during the night and by altering sleeping habits. Shift work and traveling to distant time zones also can interrupt this natural cycle. Since the circadian rhythm is important to many key biological processes, it has been hypothesized that continual disruption of this rhythm may negatively affect cellular functions, which in turn might promote certain cancers.

This hypothesis of circadian disruption in cancer development has been supported by several epidemiological studies. It has been shown that shift work may increase risk of several cancer types, such as hormone-related breast and prostate cancers. This clock-cancer connection has led to the circadian gene hypothesis proposed by Yong Zhu, Ph.D., an associate professor in the division of Environmental Health Sciences, and his colleagues. Zhu believes that genetic variants and/or epigenetic alterations in genes responsible for maintaining circadian rhythms may affect an individual’s risk of cancer.

Zhu’s group has been studying the role of circadian genes in cancer development using a variety of genetic and epidemiological approaches. They have provided the first evidence linking genetic variants in circadian genes to risk of breast cancer, non-Hodgkin’s lymphoma and prostate cancer. More recently, they found that methylation patterns, an epigenetic event, in circadian gene promoter regions may also play a role in cancer development.

Since many of these genes function as transcriptional factors, which turn other genes on or off, Zhu’s group is also performing in vitro functional analyses to better understand the molecular involvement of circadian genes in tumorigenesis. So far, they have observed a large impact on cancer-related biological pathways by these genes, which further confirms the previously observed associations between circadian genes and cancer.

These findings could help scientists develop specific circadian biomarkers for cancer and identify people who are at higher risk for circadian disruptions and cancer development. Given the fundamental role of circadian rhythm in biological processes, findings from Zhu’s research – although still preliminary – could have important implications for public health.



## Promoting global health

An international conference at Yale this spring will host health professionals from countries overcoming the odds.

Rebuilding after years of civil war, the African nation of Rwanda has, among other things, implemented programs that prevent HIV/AIDS transmission from mother to child and reduced maternal death rates by one-third. All this has been achieved in the span of a few years.

The results are impressive, but significant work remains for Rwanda and other countries that have made recent progress in improving their health care delivery.

In June, the newly created Global Health Leadership Institute (GHLI) at Yale will host nearly 30 delegates from several countries to review their recent health care successes and build on that momentum by addressing new problems. During the weeklong conference, leading health professionals from Rwanda and five other countries—Ethiopia, Mexico, Ghana, Singapore and Liberia—will work with Yale faculty and invited experts to identify challenges and devise strategies. Ghana, for instance, will focus on developing a health care system that uses human resources more efficiently and effectively.

The GHLI was created by Elizabeth H. Bradley, Ph.D. '96, professor in the division of Health Policy and Administration and director of Global Health Initiatives at the Yale School of Public Health, to strengthen international health care systems. "The GHLI conference will give the delegations important tools to think differently about how to address the problems they face," Bradley said. "Our goal is for the conference to serve as a launching point."

In many cases, the invited countries are succeeding despite limited financial resources, so the solution to overcoming health obstacles is more complex than dollars and cents. There are subtle factors at play that explain why some nations are better able to address the health needs of their citizens. Bradley said these successful models will be studied to understand how and why they work and to see if they can be replicated in other settings.

The conference is the GHLI's inaugural event, and it ties in with President Richard C. Levin's goal to transform Yale into an international university in the 21st century. Indeed, there are few issues more relevant to a global outlook than public health. "Given the importance of health to progress, the Global Health Leadership Institute will play an integral



Jim Tomarken

A mother and her children enjoy some time on the Liberian coast. Developing strategies to decrease maternal mortality will be a task for Liberian health officials when they travel to New Haven this spring to participate in the inaugural conference of the Global Health Leadership Institute. They will be joined by representatives from five other countries seeking to make their own public health improvements.

**"The GHLI conference will give the delegations important tools to think differently about how to address the problems they face."**

*—Elizabeth Bradley*

role in the internationalization of Yale and support our full engagement in global health and health care," said Mike Skonieczny, GHLI's executive director.

As the conference nears, Bradley promises that it will be a vigorous and challenging week. Funded by Yale and the Seattle-based Glaser Progress Foundation, the symposium will include master classes and panel discussions. Participants also will be exposed to concepts of grand strategy—a model for accomplishing far-reaching objectives with limited resources. By week's end, there will be a network of global health leaders, equipped with plans for the next steps in health care improvements in their respective countries.

"In order to make progress, we need a more integrated and coordinated approach to helping countries solve the enormous health and economic burdens they face. Yale's GHLI will work to achieve this by helping in-country leaders incorporate grand strategy into their policy decision-making process," said Martin Collier, the Glaser Progress Foundation's executive director.

*Michael Greenwood*

# Where the ticks are

A soon-to-be-released online map will detail the location and density of ticks that carry Lyme disease throughout the eastern United States.

By Steve Kemper



Pep Montserrat



Courtesy of Durland Fish (2)

The first indication for most people that ticks live nearby comes when they pull one of the hungry parasites off of themselves, their child or the family pet. And then the panic over Lyme disease begins.

Getting a handle on just how many infected ticks there are and where exactly they lurk in greatest numbers could help lessen such alarm. In fact, accurately mapping the range and concentration of ticks infected with *Borrelia burgdorferi*, the pathogen that causes Lyme disease, has long been a goal of researchers, though their tiny size and the sheer amount of fieldwork involved made the task daunting.

Now after years of labor and tens of thousands of ticks collected from scores of sites around the eastern United States, the Yale School of Public Health is on the verge of releasing what is likely the most comprehensive map of its type ever created.

“This is the biggest field study on vector-borne disease ever conducted,” said Durland Fish, Ph.D., professor in the division of Epidemiology of Microbial Diseases, who is overseeing the mapping project. “We had more than 100 people working on this project over four years.”

This massive effort—funded by a \$2.1 million grant from the Centers for Disease Control and Prevention (CDC)—was the first large-scale standardized field study of Lyme disease. The result: a sophisticated “human risk map” for Lyme disease that covers the eastern half of the United States. The map will soon be available on the website of the American Lyme Disease Foundation. Fish expects the map to be used by doctors, public health officials and the general public as a tool in the continuing struggle against this disease.

In just three decades, Lyme disease has become the most common vector-borne disease in North America. Between 1997 and 2007, the number of cases reported to the CDC more than doubled, to 27,444, though many more cases go unreported and others are misdiagnosed. The disease is also expanding its territorial reach, but its parameters were unclear until Fish’s study.

Infections transmitted from wildlife to humans, such as Lyme disease, West Nile fever and rabies, “have a particular geographic locus and environment,” said Fish. “People who aren’t exposed to the environment aren’t exposed to the pathogen. With Lyme, deer, rodents and birds harbor the bacteria that infect the ticks that then bite humans. So we need a map depicting where the infected ticks are, where they’re most abundant and what environmental conditions cause human risk. That requires collecting a huge amount of environmental data.”





In other words, lots of tedious low-tech fieldwork. First, Fish's team concentrated on the eastern half of the country at the 100th meridian, which runs through the Great Plains. This encompasses the entire range of the primary tick vector *Ixodes scapularis*. They then divided everything east of this into 95 quadrants of roughly 62 square miles. Within each quadrant they randomly chose one to three public forested sites to monitor.

Then the real work began. Over four years, dozens of field workers were hired, trained and coordinated by Maria Diuk-Wasser, Ph.D., assistant professor in the division of Epidemiology of Microbial Diseases, and Annie Gatewood, a doctoral student. The field teams visited more than 300 sites, typically five times per summer. At each visit they dragged a heavy white cloth through 1,000 square meters of vegetation to snag ticks.

They collected 50,000 of them, of which 12,000 were *Ixodes scapularis*. Every *I. scapularis* was tested for the Lyme pathogen. During each visit, the team also took soil samples and recorded the site's temperature, relative humidity and atmospheric pressure. Meanwhile, satellites were gathering information about each site, including the density and type of vegetation.

"We know where the ticks are and where they aren't, where they're infected and where they aren't. That's where technology comes in. We used the data to develop a new mathematical model to predict where infected ticks would be found," said Fish.

The team used half of the data to develop the model and tested the model's accuracy against the other half. "We were able to predict with a fair degree of accuracy and at a fine spatial resolution," said Fish.

Several environmental factors proved most important for predicting the presence and density of infected ticks (or their absence): the location's humidity, altitude, minimum temperature and density of vegetation.

Once the map is online, anyone will be able to type in an address or zip code and find data about the risk of Lyme disease in a particular location. To Fish, one of the map's most important revelations is to make clear where Lyme disease is *not* a risk.

"In uninfected areas," he said, "if someone thinks they have Lyme or has been diagnosed with Lyme, they should seriously consider an alternative diagnosis, and physicians should be skeptical of diagnosing the disease. Misdiagnosis of Lyme is probably as important a public health problem as real Lyme."

The disease has become an emotional and political issue beyond medicine or science. Fish points out that Lyme disease support groups exist in almost every state, even in places where there's no risk of getting the disease. But he doesn't expect the new map to end the debate. "All we can do is provide the evidence."

Because the range of Lyme disease is evolving, Fish hopes that the map will be used as an early warning system, forecasting where infected ticks might show up next due to favorable environmental conditions and proximity to already infected areas. The map could forewarn doctors and health officials in these areas, giving them time to prepare and to educate the public about the disease.

This taps into what Fish considers a larger problem: responses to Lyme disease are usually reactive, never preventative. "People look at Lyme strictly from the medical perspective," he said, "but this is a medical problem with environmental solutions. You can do all the diagnosis and treatment you want, but that's not going to prevent

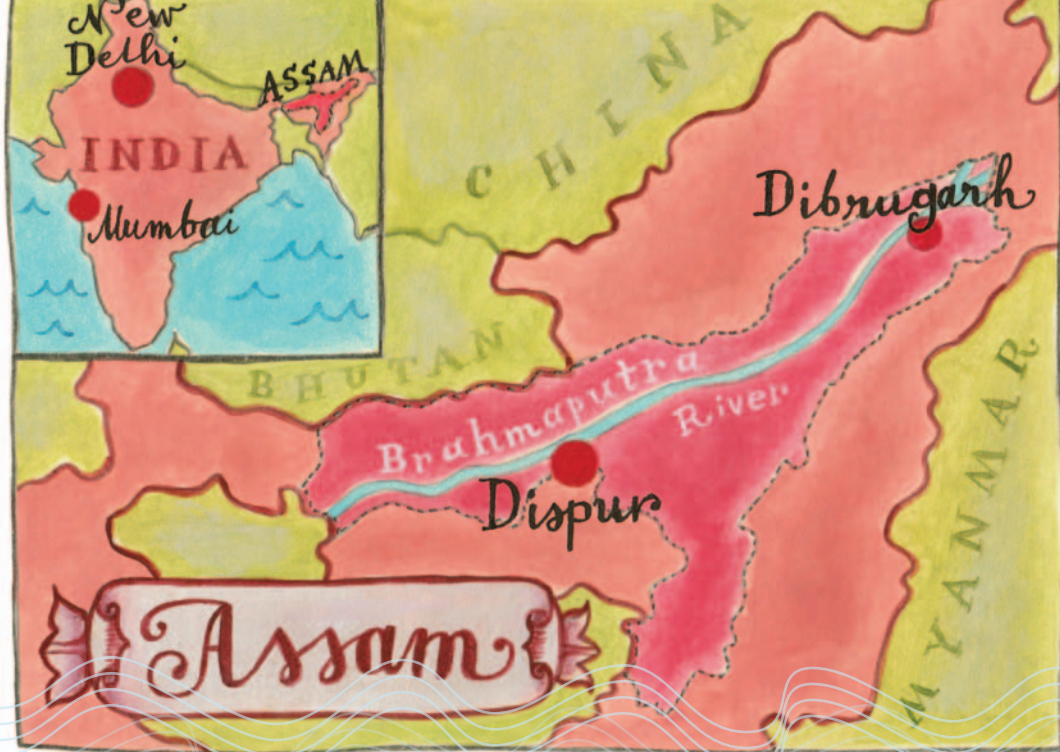
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any cases. You have to do something about the environment—about the ticks. But if you propose an environmental project to the National Institutes of Health, they laugh you out of the room. We don't understand the very basics of how tick populations are regulated in nature. If we knew, we might be able to identify a weak spot."

In the meantime, Fish describes the ecological modeling that led to the new risk map as state-of-the-art and the map itself as a significant advance in our understanding of Lyme disease dynamics. **YPH**

*Steve Kemper is a writer based in West Hartford, Conn.*





Mariko Jesse

# A summer plying the *Brahmaputra*

A second-year M.P.H. student goes to India to fulfill a requirement and comes away with new views of the world and his role in it.

Story and photographs by Gabriel Forrey

Nestled between China, Myanmar and Bhutan and connected to the rest of India by only a narrow thread of land, the state of Assam is a unique place. Assam's backbone is the Brahmaputra River, a wide, fast-moving artery that bisects the state's fertile flood plain, across which countless tea gardens, villages and pastoral life abound. The Brahmaputra eventually forms a highly braided channel as it flows through upper Assam, from which rise numerous islands known to locals as *chaporis* (pronounced suh-poor-ees). The *chaporis* residents rely heavily on the river for their livelihoods, yet these geographically isolated islands also leave the inhabitants susceptible to devastating monsoon floods and rapid erosion, which frequently claim crops, homes, livestock and, often, lives.

I first glimpsed Assam's grandeur during the summer of 2008 as I gazed through the window of a Boeing 737. As the jet eased below a thick blanket of clouds, a vast expanse of greenery appeared, carpeting the flood plain below and stretching to the distant Himalayan foothills. The lush tranquility was breathtaking. Sharply rising peaks, green palms, fields of tea and a lazily meandering river were all that could be seen. No cities. No highways. No signs of civilization except for that small grey airstrip on which we landed.

The town of Dibrugarh on the Brahmaputra's southern bank became home for the next two months, and the remote *chaporis* communities became the daily focus of my team's public health internship. Our task was challenging:



we had to cope with personal struggles in adapting to a new culture, while simultaneously trying to understand major health care and education problems in order to develop sustainable solutions. We probed for answers to the pervasive social exclusion, abnormally high mortality rates and illiteracy that we found. We observed the daily life of residents and were eventually invited to become a part of their routines. Each day provided insights and fostered a growing bond that opened my eyes to an existence where hardship and happiness coexist. Over the internship's 10-week course, four of us (Nino, Ruchi, Jina and I) wrote a 60-page case study about a boat clinic intervention known as "Akha: Boat of Hope," presented our findings and recommendations to a national UNICEF convention in New Delhi and laid a foundation for improving health and educational access for all *chaponi* residents.

The internship also gave me a new perspective on the role of public health—one that pairs an understanding of the causes and diffusion of disease with advocacy. Public health requires sustainable collaborative efforts to ensure tangible change. We discovered that the key to success in Assam was a public-private partnership, where all stakeholders have an equal voice. Indeed, such an approach to

health is vital to unlocking opportunities for people who may otherwise never be afforded them.

My time in Assam also prompted reflection on my life and the direction it will take. One sweltering day while sitting on the Brahmaputra's bank—a place that many friends would consider the middle of nowhere—I saw, really for the first time, how immensely fortunate I have been. I appreciated the richness of the opportunities I have enjoyed, all largely because of where and when I was born. Afflictions like malaria, malnutrition and dysentery, highly prevalent in Assam, have never been a threat to me. I realized how privileged I am to wake each morning in a comfortable bed, take a warm shower and have enough to eat.

For me, washing my hands, brushing my teeth and eating a balanced meal are second nature, but proper nutrition and basic hygiene are only now appearing on the horizon for thousands of villagers in Assam. Many suffer from diseases or die simply because they are unaware of or, more likely, unable to acquire basic goods or medicines.

Their concerns revolve around storing enough rice as they prepare for the coming monsoon or ensuring that a woman gives birth without severe injury or death. Sadly, a separatist group exacerbates this vulnerability through

**"I still close my eyes from time to time and return to the islands in the Brahmaputra. The villagers' faces appear first. They are always smiling, inquisitive and receptive. Their joy and warmth are incredible. ..."**

**— Gabriel Forrey**

The UNICEF team begins fieldwork for the day, which means slogging through muddy, leech-infested water to reach survey respondents. Each pool was a new adventure, as the depth, and what would be found at the bottom, was unknown. Gabriel Forrey is in the foreground.







Children run along the riverbank waving goodbye as the Akha boat departs for the three-hour trip to Dibrugarh.

random attacks and indiscriminate killing of men, women and children. Pausing to reflect on all of these factors, I can see how the residents teeter on the brink of existence.

The internship was over before we knew it, and I began my journey home on an enormous jet one August evening. I had been anxious to experience a different culture, and my summer in India was an experience that changed my life. I learned volumes about how successful public health initiatives require foresight, thoughtful planning and passion. Such initiatives also require individuals who understand what it means to be human and humane, honest and open and who genuinely care about those in need of help.

After discovering a facet of public health about which I am endlessly passionate, my career now points in a new direction. I now hope to work with program managers, policy analysts and politicians to ensure that public health officials remain cognizant of all members of the global community and do all that is possible to provide them with the means and knowledge for a healthy life. Graduation from Yale's School of Public Health will be a launching pad that hopefully will lead to a career with an organization like the World Health Organization, the United Nations or another foundation that embraces this vision. In the near-term, I want to return to Assam to complete the work we started and then earn a law degree. Afterward, I aim to work as a health policy strategist, helping to redesign and improve health care systems. My long-term goal is to hold elected office and navigate the political arena, where so many important public health decisions are made.

I still close my eyes from time to time and return to the islands in the Brahmaputra. The villagers' faces appear

first. They are always smiling, inquisitive and receptive. Their joy and warmth are incredible—the kind that gives lump-in-the-throat emotions and makes the hairs on my neck stand on end. I often think of the last day we spent with them. It was a sun-drenched afternoon, and when we finished our surveys, we congregated near the schoolhouse to play games, take photos and bid goodbye. Since our team had been to that particular site multiple times, the villagers knew us; however, direct communication remained difficult, so we used gestures and smiles instead of words. When we left that evening, the adults shook our hands and hugged us, and the children scampered along the riverbank chasing our departing boat as they waved and yelled their goodbyes. **YPH**

*Gabriel Forrey is a second-year M.P.H. student at YSPH.*



A mother calms her baby as they wait in line to see the Akha boat doctors.

# Confronting torture



**An alumna documents allegations of mistreatment and dedicates her life to defending human rights.**

**By Farnoosh Hashemian**

Looking back, I can clearly see the beginnings of the social convictions that guide my life today. I grew up in Iran during the 1980s, a time of profound social and political turmoil, when the impact of revolution, the devastating war with neighboring Iraq and deep corruption and political oppression crippled the country. Deprivation, chaos and fear became the norm. I remember running to shelters while missiles came down, as well as my family's flight from Tehran when the threat of chemical strikes became imminent. These extreme circumstances made an impression on my young conscience and gave me the courage to commit myself to public service and social justice.

The struggle to uphold the ideals of human rights and to end the political and religious reign in Iran pervaded my college years at Tehran's Islamic Azad University. I participated in political rallies and wrote newsletters demanding freedom, transparency and the inclusion of minorities in the political process. However, I was a stranger to health care problems until I returned in 2001 to the United States, the country where I was born, to continue my education. I found myself in New Haven working for the Valley Women's Health Access Program, a center dedicated to providing uninsured women with access to basic health services. As I learned more about the needs of this disadvantaged population, I discovered new ways to get involved in human rights—particularly the inalienable rights to be healthy and free of poverty. I was stunned that, in the world's most prosperous and powerful country, wide economic and health disparities existed everywhere. It was my recognition of the relationship between health care and

self-determination, as well as the inextricable link between health and human rights, that led me to pursue my master's in public health.

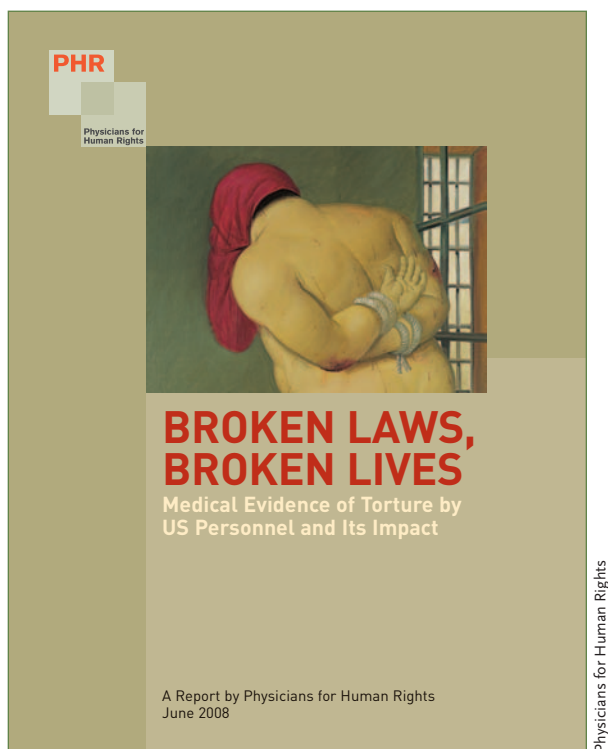
At Yale, the opportunities to learn seemed endless. I took advantage of an intellectually ambitious curriculum and individualized mentoring, and I engaged distinguished public health professionals who routinely visited the school. In 2004, I attended a talk on the challenges of restoring essential public health services in Iraq and reducing the mounting human cost of the war. This lively discussion inspired me. The grim statistics that were cited evoked personal memories of the suffering caused by the Iran-Iraq War. With this, I discovered the niche I had been searching for: I would become a conflict epidemiologist, gathering evidence of the scope and scale of human rights violations that occur during wars and other complex emergencies. Indeed, conflict epidemiology is a powerful tool to advocate for alleviating human anguish. It generates data that can be used to guide humanitarian relief efforts, plan treatment and prevention programs for survivors and develop policies that ensure accountability.

A few months later, I received the Downs International Health Student Travel Fellowship and returned to Iran. I traveled to a distant region that borders Iraq to document the lasting mental health consequences that chemical warfare had for the Kurdish minorities. I interviewed many survivors, documenting their chilling stories. I was honored to give voice to the suffering of this largely forgotten and persecuted population. I also gained firsthand experience using public health instruments to bring attention to the



## Alumni Spotlight

long-term and severe consequences of manmade crises. The data gathered were so compelling that the government appointed a psychologist to the chemical-attack survivors to start the long healing process. This project was one of the most formative experiences of my life.



Alumna Farnoosh Hashemian was the lead author of a recently published Physicians for Human Rights report, *Broken Laws, Broken Lives*, which alleges mistreatment of detainees in the custody of U.S. personnel in Iraq, Afghanistan and Guantánamo Bay, Cuba.

Since graduating from Yale in 2005, my commitment to health and human rights has grown. I've implemented research projects in the Middle East, Asia, Europe and the Americas. I have worked with international experts on global priorities such as tuberculosis and tobacco control, post-disaster management, homosexual and transsexual health and the impact of globalization on the overall health of populations.

In late fall of 2006, I took on a new challenge. Deeply concerned by post-9/11 infringements on human rights, I joined the Cambridge (Mass.)-based Physicians for Human Rights (PHR), a co-recipient of the 1997 Nobel Peace Prize for its efforts to ban land mines. In the two years that followed, I led human rights investigations into the legality

and impact of the CIA and Department of Defense detainee interrogation policies and practices. The overarching goal of both investigations — *Leave No Marks: Enhanced Interrogation Techniques and the Risk of Criminality* and *Broken Laws, Broken Lives: Medical Evidence of Torture by U.S. Personnel and Its Impact* — was to humanize the debate on detainee treatment and to educate and engage the public and lawmakers in order to end aggressive and coercive interrogation practices.

*Broken Laws, Broken Lives* provides clear and comprehensive medical evidence of a long list of abusive techniques such as beatings, exposure to extreme temperatures, sexual humiliations, sleep deprivation and extremely painful stress positions inflicted on detainees who were in U.S. custody in Iraq, Afghanistan and Guantánamo Bay, Cuba. Being the lead author of this report was an intense, draining experience; I came face to face with evidence of human cruelty that haunts my thoughts and dreams to this day. However, the unequivocal evidence of abuse gathered and the scope of the crimes documented in the report caused much public outcry and stirred the political bureaucracy. Most importantly, it gave the nameless and faceless victims visibility. The report, I believe, has helped to shift congressional, media and public attitudes on detainee treatment. Its call is unambiguous: prohibit torture and cruel practices, hold accountable those who broke the law and give justice to those who suffered.

Defending the powerless and protecting and promoting human dignity are indeed fundamental values of public health. As my career moves forward, I aspire to contribute to the critical work that needs to be done on the nexus of health and human rights to ensure that human dignity is recognized and realized for all people, in all places and at all times.

I am heartened by the Obama administration's position that the United States does not have to compromise its fundamental values in its struggle against extremism. In the pursuit of truth and justice, it is equally important that we investigate how these abuses happened and hold those who authorized them accountable. Restoring the legal and moral standing of the United States in the world is a long process, and it will start with demonstrating our unwavering commitment to upholding the rule of law. **YPH**

*Farnoosh Hashemian is a 2005 graduate of Yale's M.P.H. program.*

## Alumni

### New administration inspires hopes for public health

By William P. Quinn



At a recent board meeting of the Association of Yale Alumni in Public Health, we toasted a new hope for our country and a new hope for public health. The door for change is finally open: President Obama got a stimulus package through and health care reform, at long last, is back on the table.

Public health professionals should play a major role in shaping the reforms to come. The new president's health care reform proposal allows us to see how our current system perpetuates inequity and suggests the changes that are necessary to provide affordable health coverage for all Americans.

It's been a long time since there was an opportunity to make major, meaningful changes to the health care system in this country. Historically,

the importance of public health has been recognized in times of crisis, but this recognition wanes once the crisis passes. Two examples are the creation of the United States Public Health Service in response to cholera epidemics in the late 18th century and clean air legislation following a thermal inversion in 1948 in Donora, Pa. Donora was a small town of about 14,000 inhabitants located in a valley, and because of its industry, polluted fogs were common. But on October 27, 1948, a thick fog settled in the valley and remained for nearly five days. The valley became more and more polluted by smoke, fumes and gases from the town's industrial plants. Twenty people died and about 6,000 became ill.

An even larger public health crisis exists now. Looking at our current health care system through a public health lens, we see that it lacks efficiency, which results in more expensive and poorer health outcomes. We also see a system that is not dealing with equity of outcomes. Public health professionals, who have documented how and why our health care system is costly and how preventive health measures will save money and improve health outcomes, need to be a major player in its reform.

During the recent presidential campaign, there were questions about

which candidate's health care plan was superior. How was it going to be paid for? Would candidates implement their plans if they were elected? Already, President Obama has provided a stimulus package that contains funding to research best practices in medical care. Hopefully, the research will lead to standards of care that will impact both the cost and quality of care.

The president's budget also calls for creating a \$634 billion reserve fund for health care reforms over the next decade. His health care reform package is the outline that will ultimately lead to universal health care. Some businesses and insurance companies have already said that they will support health care reform. Even though they may be part of the problem, they know that they must now be part of the solution.

The Obama administration has momentum, a mandate and a public that is much more informed. As public health professionals, we are best equipped to lead the movement for health care reform and assure that the reform is not compromised by misinformation or special interests.

*William P. Quinn, M.P.H. '75, is president of the Association of Yale Alumni in Public Health.*

# SAVE THE DATE!

MARK YOUR  
CALENDARS

## June 5, 2009 YSPH Alumni Day

### Topic

Universal health care

### Keynote Speaker

David U. Himmelstein, M.D.,  
*Associate Professor, Harvard Medical  
School; Co-founder, Physicians for a  
National Health Program*





## From New Haven to Addis Ababa, again and again

By Martha Dale

I still remember the phone call I received in late 2005 and the unexpected but intriguing proposal presented by the person on the other end: Would I like to go to Ethiopia and work on health care initiatives?

It took me by surprise. I was being asked to join a team of Yale faculty working with the William J. Clinton Foundation on the Ethiopian Hospital Management Initiative (EHMI). The initiative's goal: help improve hospital management and operations.

How could I, a career hospital administrator, working as the executive director of an AIDS skilled-nursing and supportive-housing provider in New Haven, help hospitals in Ethiopia? But with only the sparsest of details, I was open to the invitation because I trusted those involved and believed in their vision. Less than a month after the surprise call from Elizabeth H. Bradley, Ph.D. '96, professor in the division of Health Policy and Administration, I, along with a team of Yale researchers, was bound for Addis Ababa, Ethiopia's capital.

Ethiopia is a landlocked, mountainous country about the size of California and Texas combined. It has nearly 80 million people, with an average life expectancy of 50 years and an infant mortality rate of 77.2 per 1,000 live births (the U.S. rate is 6.9 per 1,000). In 2006, approximately 1.5 million Ethiopians, or 4.4 percent of the population, were living with HIV/AIDS. An estimated 95,000 of those were children. The health challenges, clearly, are enormous.

Once in the capital, we began work on a detailed needs assessment and baseline evaluation of key hospital management indicators in nine government-run hospitals. We observed operations and recommended systematic changes, which the EHMI would share with their hospitals. The needs assessment also provided baseline data on existing key hospital management indicators that would be tracked over the lifetime of the project.

In July 2006, within six months of starting the needs assessment, 24 hospital administration fellows from around the globe were recruited to work in a partnership-mentoring model with the Ethiopian hospital medical directors. The fellows participated in routine daily activities with their in-house hospital management teams, identified systems problems and developed solutions. The partnership-mentoring program continues to this day, with fellows now placed exclusively in regional health bureaus to provide a more expansive locus of impact on health systems development.

During the program's first year, EHMI also conducted a certificate program for senior staff working in government hospitals. This certification program, taught in Ethiopia by Yale faculty from the Yale Professional Development Program in International Healthcare Management, covered diverse topics, including human resource and financial management, quality improvement and nursing standards.

As a seasoned traveler, I thought that a trip to Ethiopia would be a relatively easy assignment. But it required all of my public health training. What propelled me to take on this challenge? Perhaps it was based in my sense of professional responsibility to draw on

my training and experiences and step outside my comfort zone. The experience allowed me to learn from international peers, who perform remarkably well with far fewer resources. This also was a chance to be a member of a team whose collective efforts far exceeded my individual capacity to effect change in the world.

Despite overwhelming odds, the rewards have been many. Participants from Yale, the Clinton Foundation and health care leaders in developing countries have learned that these projects can be successful if we work as a team. We have also learned that we need to listen and to be persistent, culturally sensitive and willing to make "course corrections" along the way for the project's success and the health of the host nation. These are lessons in effective program leadership for any practitioner in any setting—international or domestic.

My passport now records four trips to Ethiopia and two to Liberia. The evolution of Yale's global health management program in these, and other, developing countries has contributed to improved quality of hospital care as part of health-sector reform.

My role in these projects has been diverse: recruiter, teacher, mentor, cheerleader, logistician, thespian, baggage handler and jack-of-all-trades. I pinch myself when I think of how I have fed my "travel bug" while practicing health care management. Who knows when or from whom the next phone call will come—but I hope that it opens doors to new public health adventures and challenges.

*Martha Dale, M.P.H. '80, is executive director of Leeway in New Haven.*

Alumni, students and friends of YSPH attending the American Public Health Association's 136th annual meeting in San Diego in October took some time to socialize at the YSPH alumni reception.



Danielle S. Williams (4)







Richard Clapp



Priscilla Canny



Michael Israel

## 1940s

**Richard Clapp**, M.P.H. '43, married Althea D. Stadler, a 1941 graduate of the Yale School of Nursing, in May 2007. We wish them many happy, healthy years together!

## 1950s

**Gerald Rosenblatt**, M.D., M.P.H. '55, was recently honored by the Palm Beach County Health Department for 10 years of volunteer service. Gerald, a cardiologist, volunteers at the Delray Clinic in Palm Beach, Fla., assisting underserved populations.

## 1960s

**Richard Ferraro**, D.M.D., M.P.H. '66, was honored by the Oral Health Foundation for establishing the country's first dental clinic in a community health center in 1967. Richard was the first to provide underserved communities with access to comprehensive oral health services and emergency treatment at what is now known as the Geiger-Gibson Community Health Center in Dorchester, Mass. The pioneering concept quickly spread across Boston and to other U.S. cities. Thanks to Richard's model, thousands of children and adults have access to oral health care—many for the first time in their lives.

## 1970s

**Elaine Anderson**, M.P.H. '76, was recently honored by the Connecticut Public Health Association with the 2008 C.-E.A. Winslow Award, for commitment and dedication to the greater community of public health throughout her career. This award is presented for outstanding contributions to the public's health by a Connecticut public health professional and is the Association's highest honor. The award commemorates Charles-Edward Amory Winslow, a pioneer in public health and medicine, who is credited with founding YSPH.

**Helen Hubert**, M.P.H. '73, Ph.D. '78, recently left Stanford University after 20 years of service as a senior scientist. She is currently pursuing independent consulting as a chronic disease epidemiologist and writes, "I would enjoy hearing from other alumni with mutual interests."

**Richard Matheny Jr.**, M.P.H. '74, director of the Farmington Valley Health District in Connecticut, was recently elected president of the Connecticut Association of Directors of Health (CADH). CADH is a nonprofit organization committed to providing a basis for local directors of health to work together to strengthen and ensure the efficient and effective delivery of public health services at the local level throughout the state.

## 1980s

**Priscilla "Penny" Canny**, Ph.D. '83, has joined The Community Foundation for Greater New Haven as its senior vice president for grant-making and strategy. She is responsible for developing and implementing the foundation's community strategies and directing its outreach in the Greater New Haven community. Penny's appointment is an ideal progression of the work that she has been doing in the community over the last decade. Most recently, she was the managing director and CEO for Connecticut Voices for Children, a research-based policy and advocacy organization.

**Mark Dembert**, M.D., M.P.H. '83, retired from the U.S. Navy in 2002 after a 27-year medical career in undersea medicine, preventive medicine and psychiatry. He is currently the chief of psychiatry for the Pennsylvania Department of Corrections, one of the largest state prison systems in the country, with more than 46,000 inmates.

**Loretta DiPietro**, M.P.H. '85, Ph.D. '88, has been named the new chair of the Department of Exercise Science at George Washington University School of Public Health and Health Services in Washington, D.C. "She brings the skills to bridge the clinical and physiological domains of exercise science with population-based public health approaches. Many of today's critical public health problems can be addressed through improved nutrition and physical activity, and under Dr. DiPietro's leadership, the department's students and faculty will contribute significantly to the solutions," said Ruth J. Katz, J.D., M.P.H., dean of the school.

**Michael Israel**, M.P.H. '80, was recently honored by New York Medical College for his exemplary leadership, service and commitment to the health and well-being of the residents of Valhalla, N.Y. Michael is president and CEO of Westchester Medical Center.

**Ellen Pappano**, M.D., M.P.H. '88, a board-certified pediatrician and fellow of the American Academy of Pediatrics, has co-founded a parenting/pediatric website: [pediatricplanet.com](http://pediatricplanet.com). Pediatric Planet was founded on the premise that in today's climate of managed care, parents and patients sometimes do not have enough time to get all of their questions answered. The goal is to provide an extensive information base, with topics ranging from growth and behavior to complex medical diseases.

## 1990s

**Paul Hadden**, M.P.H. '99, vice president of Cowen Healthcare Royalty in Stamford, Conn., and his wife, Claire, welcomed Caroline Tate Hadden into this world on September 21.

# Alumni Services



Ashika Brinkley

**Christine Layton**, M.P.H. '90, Ph.D., is currently working as a public health policy researcher at RTI International. Christine has been working in Washington, D.C., in the field of health policy since graduation and also completed her Ph.D. at Johns Hopkins in 1999. She's married to Ned Sacktor, an associate professor at the Johns Hopkins University School of Medicine, and together they have two wonderful children, Elizabeth, 8, and Laura, 5.

## 2000s

**Ashika Brinkley**, M.P.H. '05, has been chosen by the Connecticut Health Foundation (CHF) as one of their 2009 Health Leadership Fellows. This program, currently in its fourth year, recognizes outstanding individuals who are making significant strides to create a healthy, safe and prosperous Connecticut. As director of the Asthma Initiative Project for New Haven, Ashika is helping improve the lives of low-income, uninsured and underinsured residents with asthma. She writes: "This experience, coupled with other collaborative and strategic planning experiences, has given me the tools to advocate for groups most affected by health disparities." Ashika is also making a difference through community involvement. Along with being the president-elect of the Junior League of Greater New Haven, she is spirit health initiative chair of Alpha Kappa Alpha sorority. The initiative, funded by a CHF grant, develops programs to improve the health of African-American women.

**Meighan Rogers Driscoll**, M.P.H. '02, director of special projects at the New York City Department of Health and Mental Hygiene, and her husband, Tim Driscoll, welcomed the arrival of their first child, Madeleine Driscoll, in July.

## Have an update?

Your classmates want to hear about you! Help us share your news of a new job, promotion, recognition, marriage or birth of a child. Send items to [ysph.alumni@yale.edu](mailto:ysph.alumni@yale.edu).

The menu of resources available to Yale University graduates continues to grow. Following is a list (by no means comprehensive) of the services, privileges and other opportunities provided by Yale and available to all alumni. They include both free and fee-based services.

## Career services

The Yale Career Network is a searchable database of all Yale alumni who have volunteered to be a resource and have expressed an interest in networking with other alumni. This network will allow you to connect with other alumni to discuss career objectives and explore career interests. You can also serve as a career resource to others by sharing your experience and skills. We invite you to join thousands of alumni by logging on to the Yale Career Network at [aya.yale.edu/career](http://aya.yale.edu/career).

## Yale eProNet/Experience

Yale eProNet/Experience is the free career service for Yale alumni that matches exceptional individuals with exceptional opportunities at the world's most desirable companies. Tailored for high-achieving professionals, our state-of-the-art online features translate into excellent matches between our experienced alumni and our employer clients. To join Yale eProNet/Experience, visit [yale.experience.com](http://yale.experience.com).

## Alumni directory

The Association of Yale Alumni maintains an online searchable alumni directory that lists all Yale alumni, including those from the graduate and professional schools. This directory is a great resource for personal and professional networking and an easy way to keep up-to-date on fellow alumni. You can access the directory at [aya.yale.edu](http://aya.yale.edu) by clicking on "alumni directory" on the left.

## Open Yale Courses

Open Yale Courses provides lectures and other materials from selected Yale College courses to the public free of charge via the Internet. The courses span the full range of liberal arts disciplines, including humanities, social sciences and physical and biological sciences. The online courses are designed for many people, including self-directed and lifelong learners, educators and high school and college students. The integrated, highly flexible Web interface allows users, in effect, to audit Yale undergraduate courses. Find out more at [oyc.yale.edu](http://oyc.yale.edu).

## On-Campus Services

### Yale courses for alumni

Alumni and their spouses can audit courses offered by Yale College. This service is available only to degree-holding alumni and their spouses and includes library borrowing privileges during the semester. If you have any questions, please contact Judith Cushingham at [judith.cushingham@yale.edu](mailto:judith.cushingham@yale.edu).

### Library borrowing privileges

Alumni are given access to the library stacks (without borrowing privileges) free of charge for 30 days each year. Borrowing privileges are available for \$15 per month or \$150 per year.

### Lectures

Campus organizations, including the residential colleges, graduate and professional schools and departments and student groups, sponsor guest lectures and speakers throughout the year. The online Yale events calendar is a great source of information on upcoming events. Visit [events.yale.edu/opa](http://events.yale.edu/opa).

### Athletic facilities

Gym use is available to alumni for \$248 for the academic year. Many exercise classes are included in these fees. All other athletic resources are available on a per-fee basis and include golf, tennis, ice skating and use of the Outdoor Education Center and the sailing center.

### Dining halls

Alumni can dine in any of the residential colleges, as well as HGS, the Law School, SOM and Kline Biology Tower. For more information, visit [yale.edu/dining](http://yale.edu/dining).

### Other campus offerings

Physical proximity to the campus provides other socially and intellectually engaging opportunities. These include campus tours; guided spring walks highlighting campus flora; listening to WYBC, the student-run radio station (94.3 on the FM dial); and an ongoing, if informal, opportunity to interact with Yale students, faculty and staff.

Please review the AYA website regularly for updated information: [aya.yale.edu](http://aya.yale.edu). If you have specific questions regarding services available to alumni that are not covered here, contact the YSPH Office of Alumni Affairs at [ysph.alumni@yale.edu](mailto:ysph.alumni@yale.edu) or 203-785-6245.



### Challenge fund doubles donor gifts to school

Counting on the appeal of a challenge, the Yale School of Public Health has launched the Challenge Fund for Public Health at Yale to double donations that support students, expand research and develop new programs.

The Challenge Fund is being anonymously funded by two Yale College alumni and comes at a time when the school has made major strategic commitments to reduce student debt, expand community-based programs and develop new global health initiatives. “This fund will maximize the impact of donor contributions to advance our missions around the globe,” said Dean Paul D. Cleary.

Gifts and gift intentions of \$50,000 to \$250,000 will qualify for a 1:1 match and will create individually named endowments in one of three areas selected by the donor: financial aid, summer internships or a Dean’s resource fund. Close to \$1 million has already been accrued toward the goal of \$2.5 million. Individual endowments will bear the donor’s name in perpetuity.

Also eligible for the Challenge Fund are planned gifts such as charitable gift annuities and trusts. Donors committing to a planned gift for the school will also create, with Challenge funds, an endowed fund that will be implemented now. The Challenge Fund will provide matching support for all gifts as long as funds are available, extending no later than April 2010.

Yale University President Richard C. Levin has called the school a “critical partner” in Yale’s endeavor to become a global university. “I know that advances in public health at Yale will have a direct impact on human health, particularly that of the world’s most vulnerable individuals and populations,” he said.

William H. Prusoff, Ph.D., professor emeritus of pharmacology, recently established a fund to prevent global infectious diseases. It provides funds for faculty and doctoral student research and summer internships. “I want to support the

students who go to foreign countries and do the research,” said Prusoff, who developed a drug to slow the advance of HIV that proved crucial against the epidemic in the 1990s.

Indeed, students seeking meaningful summer internships—a cornerstone of the public health degree—are now as likely to pursue opportunities in places such as India, Niger and Ecuador as in New Haven or New York City.



Courtesy of Eduardo Braniff

Eduardo Braniff, a ’93 graduate of Yale College, was prompted by the public health challenges in his native Mexico to endow a fund for student internships in that region. “Latin America is in dire need of public health attention,” said Braniff. “The school will be able to recognize compelling opportunities.”

More information on the Challenge Fund can be found at [publichealth.yale.edu/challenge/index.html](http://publichealth.yale.edu/challenge/index.html) or by contacting Martin Klein, M.P.H. ’86, associate dean for development at the Yale School of Public Health, at 203-436-8538 or [m.klein@yale.edu](mailto:m.klein@yale.edu).

Melissa Pheterson

### YSPH library enters the virtual age

The library at YSPH is bowing to the electronic age by morphing from a physical library—with shelves, card catalog and study carrels—into a virtual resource database.

“The nature of how our users access information is radically changing. It was

a self-evident but tough decision,” said Matthew Wilcox, who will retain his title as public health librarian.

In early spring, the journals and books migrated from the basement of 47 College St., leaving behind aisles of empty shelves. Widely used materials—as determined by circulation statistics—now reside at the medical library at 333 Cedar St. Less frequently used resources are stored at Yale’s shelving warehouse in Hamden, with material available upon request. All “non-unique” material, such as editions of *The New England Journal of Medicine*, already well-stocked on campus, will be recycled.

The explosion of electronic resources, Wilcox explained, has given students and faculty fewer reasons to come into the library, even as it heightens the need for Wilcox’s guidance and expertise in navigating the database.

Wilcox said the decision grew out of a combination of input from a faculty committee, surveys of faculty and students and discussions with staff. His tweaked “librarian” position complements his other role, as YSPH’s director of academic technology—in which he oversees access to information, from computer labs to distance-learning initiatives.

The library’s physical space will likely be reconfigured for group study rooms and lounge areas, allowing students to more comfortably use this basement oasis as they do now: catching up with friends, discussing coursework and relaxing.

For his part, Wilcox welcomes the prospect of becoming one of the first librarians to preside over a collection that’s transitioned into a virtual library. “To be honest, I’m tired of looking at books right now,” he said.

M.P.

## A state-of-the-art lab for combating lethal diseases

A thoroughly renovated, modernized and expanded biosafety lab that will facilitate research on some of the deadlier bacteria and viruses known to humankind is opening on the ninth floor of the Laboratory of Epidemiology and Public Health.

The biological safety level 3 (BSL3) facility is brimming with security and safety features—even the wall paint underwent inspection to determine whether it was smooth enough to be completely disinfected in the event of a spill (it was). Among the diseases the facility is designed to study, and safely handle, are West Nile virus, tuberculosis, influenza and SARS.

Given the virulence of BSL3 agents—which have the potential to cause fatal disease in humans—entry to the facility is tightly controlled and all personnel with access must undergo extensive certification training, said Benjamin Fontes, a biosafety officer at Yale. Dozens of people worked for nearly 18 months to ensure that all federal and state codes were met. “It was really an amazing coalescence of health, safety, facilities, animal care and security



professionals,” he said. There is only one level of laboratory with a higher designation: a BSL4 facility contains exotic agents (the Ebola virus among them) that can cause death and for which there are no known vaccines or treatment. The nearest such lab is in Boston.

Durland Fish, Ph.D., professor in the division of Epidemiology of Microbial

Diseases, said that biosafety labs are critical to advancing public health. “It’s always been a fight between us and the microbes. ... We need to do research in order to identify these microbes and develop treatments and vaccines.”

*Michael Greenwood*

## Symposium explores “new agenda” for Washington

Encouraged by President Barack Obama’s declared openness to innovation, the School of Public Health and the Yale Law School (YLS) co-sponsored a symposium titled “Global Health Policy for the New Administration” to highlight worldwide health care issues meriting the president’s attention.

“A core part of our mission is the prevention and amelioration of diseases around the world,” said Dean Paul D. Cleary, welcoming the panelists. “We’re deeply committed to global health, and we’ve brought together incredible people today to shape a new agenda.”

YLS Dean Harold Hongju Koh noted Yale’s unique position of leverage in an Obama White House—with Yale alumni well-represented in the administration and the White House.

“This conference will build the bridge between public health and legal studies at Yale,” Koh said.

The January symposium opened with a discussion led by Jennifer Prah Ruger, M.Sc., Ph.D., associate professor in the division of Health Policy and Administration, who advocates making health care “a stronger pillar of American foreign policy, to underscore the universal value of good health.” Cementing leadership in this realm, she said, is critical for the new administration. She called on the government to increase funding, research and technological assistance, suggesting that President Obama appoint a deputy director for global health. At the same time, she underscored the need for more efficient spending—for example, by “pooling risk”

at the national level to create a framework for national health insurance.

Robert W. Makuch, Ph.D. ’77, a professor in the division of Biostatistics, stressed the need for improvements in health care delivery with an attendant reduction in cost, as in the manufacture of the new “biologics” drugs. Urging Congress to investigate ways to make them cost-efficient, he endorsed a focus on preventative measures—referencing his work training the Chinese FDA to monitor drug development, efficacy and safety. “This is a relatively inexpensive way to improve public health in that country without expending billions of dollars,” he said.

In his keynote address, Georgetown law professor Lawrence O. Gostin pointed out that self-interest, if not moral obligation, should compel countries to pour resources into redressing global health problems. “Health threats inexorably spread to neighboring countries, regions and even continents,” Gostin said, citing Legionnaires’ disease, monkeypox, West Nile virus and foodborne illnesses.

Gostin added that meeting “basic survival needs”—nutrition, medication, potable water—is integral to improving prospects among the world’s poorest populations.

Gostin also praised Deans Koh and Cleary for hosting the conference, taking the initiative to “push scholarly ideas and make them matter in the world.”

*M.P.*

## \$11 million grant allows Yale to fight AIDS on many fronts

An infusion of \$11 million in federal support will enable Yale University’s Center for Interdisciplinary Research on AIDS (CIRA) to expand its battle against the disease locally, globally and among groups disproportionately affected by the pandemic—children, women, intravenous drug users and people of color.

The grant from the National Institute of Mental Health (NIMH) comes at a time





when the need for practical and cost-effective ways to stem the spread of AIDS is paramount. The Centers for Disease Control and Prevention recently reported higher-than-expected estimates of new HIV infections in the United States.

"We are very excited about the new award, because it will allow us to build on CIRA's historic strengths and forge new programs that are responsive to changes in both the pandemic and the scientific community," said Paul D. Cleary, director and principal investigator of CIRA and dean of the School of Public Health. CIRA is one of eight HIV research centers in the United States funded by the NIMH.

The funding will support CIRA's ongoing research to identify and analyze behaviors, policies, laws and structural factors that influence HIV rates and to investigate treatment and ways of preventing and reducing the incidence of HIV infection.

CIRA's attention to HIV/AIDS research close to home will remain important, as will international efforts. Over the years CIRA has more than quadrupled its HIV prevention and health services in India, China, Russia, the Middle East, the Caribbean, Latin America and Africa.

*Michael Greenwood*

### Research on hospital hierarchy awarded for originality

Hospital employees in lower-status professions are less likely to be forthcoming with quality improvement suggestions because they fear jeopardizing their jobs, according to an award-winning study co-authored by Ingrid M. Nembhard, Ph.D., assistant

professor in the division of Health Policy and Administration and at the Yale School of Management.

However, that trepidation can be overcome by team leaders who, in words and actions, invite and appreciate the contributions of others, said Nembhard.

The paper, "Making it Safe: The Effects of Leader Inclusiveness and Professional Status on Psychological Safety and Improvement Efforts in Health Care Teams," was recently honored for its originality, contributions to the field and potential to inspire other research by the Center for Positive Organizational Scholarship, Stephen M. Ross School of Business at the University of Michigan.

Nembhard said the findings are important to academics and practitioners.

"This insight is timely, given the recent recognition of quality problems in health care and practitioners' interest in understanding why problems exist and how they may be surmounted," she said.

The study found that individuals in lower-status professions, such as nurses, felt less psychologically safe than individuals in higher-status professions, such as physicians. Psychological safety refers to the assurance of immunity among health care professionals when voicing concerns, asking questions or conceding mistakes.

As a result, they were less willing to engage in quality improvement efforts like questioning current practices, suggesting controversial ideas or participating in experiments that might fail. They also feared they would be punished or embarrassed by higher-status employees if they spoke out.

The study was originally published in the *Journal of Organizational Behavior* in November 2006.

*M.G.*

### Yale-Tsinghua partnership to benefit Chinese women

The Yale School of Public Health is partnering with Tsinghua University in Beijing to provide management and leadership education for 500 women in China working in the health care field. The partnership, beginning in 2009, is part of the Goldman Sachs 10,000 Women initiative.

Together, Yale and Tsinghua will create a curriculum to build the business and management skills of mid- and senior-level managers in the health sector, particularly in the areas of quality improvement, human resources development, financial management and leadership.

The 10,000 Women initiative is a global effort to provide women, predominantly in countries with developing and emerging economies, with business and management education. Goldman Sachs will commit \$100 million over the next five years and has partnered with more than 50 universities and organizations worldwide to create and develop programs to improve the quality and capacity of business education in developing regions around the world.

"The partnership between Tsinghua and Yale will help build strong, effective leaders in the health care sector," said Dina Powell, managing director and global head of corporate engagement at Goldman Sachs. "We are honored to have such prestigious partners join us in the 10,000 Women initiative."

This is a transformational time for China's health sector, with an expanding economy and commitment to high-quality health services for all. But policy reforms are less effective without skilled management and strong leadership in health institutions. "We hope this program will be a cornerstone in effecting the changes in health quality and equity that China envisions," said Elizabeth H. Bradley, Ph.D. '96, professor in the division of Health Policy and Administration and director of Global Health Initiatives at Yale.

A research report prepared by Goldman Sachs, “Women Hold Up Half the Sky,” found that strengthening education for women is a critical and underutilized lever for economic growth in emerging economies. The report concluded that per capita income in China could increase by almost 4 percent with greater participation by women in the labor force. In countries like India, Egypt, Iran and Turkey, the increase in per capita income could exceed 10 percent.

M.G.

### Exercise and cancer study funded with \$7 million grant

Nearly \$7 million in combined grants has been awarded to a researcher at the Yale School of Public Health to examine the effects of exercise on two types of cancer unique to women.

Melinda L. Irwin, Ph.D., M.P.H., associate professor in the division of Chronic Disease Epidemiology, received the funding from the National Cancer Institute (NCI) to study whether physical activity can affect ovarian and breast cancer prognosis and survivorship.

Irwin believes that a regular exercise regimen – coordinated with other forms of traditional treatment such as chemotherapy – can potentially have a significant effect on survival, recovery and overall mental and physical health.

“Currently, after patients complete treatment for breast or ovarian cancer, or any cancer for that matter, few, if any, rehabilitation or survivorship programs are available to help them get back to their activities of daily living. An exercise program may not only help alleviate side effects of treatment, but may also confer benefits to overall and cancer-related health,” Irwin said.

In the first study, Irwin will enroll 230 Connecticut women over a period of several years, all of whom have completed treatment for Stage I to III ovarian cancer, into a randomized exercise trial. Half of the

participants will be engaged in a regular regimen of moderately intense aerobic exercise (such as walking). They will be monitored for body composition, quality of life and hormone production that is possibly associated with ovarian cancer prognosis. The remaining participants will serve as a control. The study will receive \$4 million in NCI funds.

The second study will focus on whether an exercise program can improve a number of negative side effects associated with the hormone therapies that are given to women recovering from breast cancer. Many women who take these hormones suffer from arthralgia, a condition that results in severe joint pain similar to arthritis, and loss of bone density. The side effects are pronounced enough that some women stop taking the hormones, which puts them at increased risk for a poor prognosis. This study will receive \$3 million from the NCI.

M.G.

### Harvard’s dean of public health visits Yale

There is an emerging consensus that global health is a key factor not only in economic growth and prosperity, but also in international security, Harvard’s new dean of public health told faculty and students during a visit to YSPH in March.

Julio Frenk, M.D., M.P.H., Ph.D., noted that the power of science has never been greater, that unprecedented capital is being spent on health and that there is a proliferation of individuals and organizations committed to redressing global health in developing countries. Despite this, many countries have been unable to make significant progress in basic health or to address a host of emerging health threats. He argued that such inequalities create a breeding ground for political violence. A healthier world will likely be a safer world, he said.



As the minister of health of Mexico from 2000 to 2006, Frenk was involved in an ambitious reform of the health system. He helped create a comprehensive national health insurance program, known as *Seguro Popular*, which expanded health care to tens of millions of previously uninsured Mexicans. A crucial aspect of the program was to decouple health insurance from employment, he told the gathering in Winslow Auditorium.

After his term as health minister, Frenk was a senior fellow in the global health program of the Bill & Melinda Gates Foundation. He became dean of the Harvard School of Public Health in January.

M.G.

With this inaugural issue of *Yale Public Health*, we’d like to ask our readers if they wish to continue receiving the print edition of *Yale Medicine*, the alumni magazine of the medical school. *Yale Medicine* can be viewed online at [yalemedicine.yale.edu](http://yalemedicine.yale.edu). To remain on the *Yale Medicine* mailing list, please write to Claire Bessinger, *Yale Medicine*, YSM Planning & Communications, 300 George St., Suite 773, New Haven, CT 06511, or e-mail [ymm@yale.edu](mailto:ymm@yale.edu).



# In Memoriam

**Estelle Siker Bernstein, M.D., M.P.H. '64**, a dedicated pediatrician and public health physician, died peacefully on June 29, 2008. She was 89. Estelle began practice as a pediatrician before joining the Pediatric Section of Montefiore Medical Group in New York. In 1964, after completing her M.P.H. degree, she worked for the Connecticut Department of Health as chief of the Maternal and Child Health Section, retiring in 1987 as the director of the Community Health Division. Estelle was a pioneer, implementing successful programs that improved the lives of state residents, including the WIC program. After retiring she remained active in the public health field, serving as president of the Connecticut Public Health Association, chair of the Child Day Care Committee of the Connecticut Chapter of the American Academy of Pediatrics and president of the Hartford Adolescent Health Council. The Estelle Siker Award, given by the Connecticut Association of School Health, is a special recognition granted to individuals who personify the ideals of health service and humanitarianism in their professional lives and have made outstanding contributions to Connecticut school health through their work.

**Rebecca Lea Calderon, M.P.H. '81, Ph.D. '86**, died peacefully at home in Chapel Hill, N.C., on December 21, after an 18-month struggle with non-small cell lung cancer. She was a lifelong nonsmoker. With her kind heart and candor, Rebecca influenced many of her students and colleagues. In 1979, Rebecca enrolled in the Yale M.P.H. program in infectious disease, and she went on to complete her Ph.D. in environmental epidemiology in 1986. Jan Stolwijk, then head of YSPH, served as Rebecca's Ph.D. thesis advisor. He remembers her "fierce determination" to conduct her Ph.D. thesis, which focused on recognizing previously unidentified serogroups of *Legionellae* bacteria. He admired her tenacity during the defense and publication

process. After completing her Ph.D., Rebecca served as an instructor in the division of Environmental Health at YSPH. She encouraged creativity and vision in the approach to environmental epidemiology. At Yale, she pioneered an intervention study to determine if home-filtered drinking water reduced illness symptoms.



During this time, she met then-Lt. Cmdr. Douglas Guthe, stationed aboard a nuclear submarine in New London, Conn., and they married in 1987. In 1989, Rebecca started a successful career with the Environmental Protection Agency (EPA), where she became the first epidemiologist to direct the Human Studies Division in the National Health and Environmental Effects Research Laboratory, located in Chapel Hill, N.C. As an EPA director, she was part of the Senior Executive Service, a group of executive-branch employees chosen for their leadership qualifications, management skills and broad perspective of government with a public service commitment. Prior to that appointment, she was chief of the Epidemiology and Biomarkers Branch, where she was actively involved in research related to arsenic in drinking water, recreational-water quality and disinfection byproducts. Rebecca's career was international in scope, including study sites in China; she also maintained professional associations with colleagues in South America and Europe. She received several awards, including EPA's Diversity Leadership Award in 2001. She contributed to more than 52 publications and wrote 17 book chapters. She was a wonderful friend, a committed public health advocate and an earnest listener who offered comfort in

her strength, but her first priority was her family. She and Doug had three beautiful and accomplished children, currently 19, 17 and 13 years old. The funeral service, attended by many of her Yale and EPA friends and colleagues, was held on February 6 at Old Post Chapel on Fort Myer and was followed by a burial ritual at Arlington National Cemetery. Donations may be made to the Lineberger Comprehensive Cancer Center at the University of North Carolina, Chapel Hill, for research on better treatment and a cure for lung cancer in women who have never smoked. For more information, visit [cancer.med.unc.edu/gift/memorialgift.asp](http://cancer.med.unc.edu/gift/memorialgift.asp).

**Bennett I. Enowitch, M.P.H. '59, M.D.**, died on January 6 due to complications from leukemia. He was 74. Bennett worked for the U.S. Walter Reed Army Institute of Research, where he studied the radiation effects of the atomic bomb. After receiving his M.P.H. degree from Yale, Bennett completed his medical degree in 1965 at the University of Basel School of Medicine in Switzerland. Bennett completed his psychiatric residency at the Institute of Living in Hartford and was board certified in both psychiatry and neurology since 1972. Bennett was on the staff at Hartford Hospital for 19 years and worked at CIGNA for more than 21 years. In 2003, he was honored by the American Psychiatric Association as a Distinguished Life Fellow. In January 2008, Gov. M. Jodi Rell appointed him to the Pharmaceutical and Therapeutics Committee. He leaves his loving wife of 44 years, Elisa Cohen Enowitch of West Hartford; a son, Boris Enowitch of West Hartford; a daughter, Schalleen Connelly of Farmington, and his son-in-law, Michael Connelly; three grandchildren; and a brother, Gerald Enowitch of Boynton Beach, Fla.

**Frank M. Isbell**, M.P.H. '63, died on October 6 in Cooperstown, N.Y. He was 81. Born in Roanoke, Va., Frank served in the Air Force during the Vietnam War and was honored with a Bronze Star Medal. After returning from Vietnam, he was assigned to the Department of Defense Surgeon General's Office at the Pentagon in Washington, D.C. In 1970, Frank retired from the U.S. Air Force and went on to serve as an administrator at Yale-New Haven Hospital. In 1973, Frank moved to Oneonta, N.Y., to become president of A.O. Fox Memorial Hospital.

**Edward M. Opton**, Ph.B., M.S., Ph.D. '43, died on December 17 at the age of 99. During World War II, Edward served as a second lieutenant in the Army Air Corps. Following the war, he became an assistant professor at North Dakota Agricultural College in Fargo. In 1952, he returned to YSPH as a research associate, where he supervised the tissue culture laboratory and worked on virus and vaccine research. He was a member for many years of the Human Relations Commission of New Haven. Though officially retired in 1978, Edward continued working with his colleagues at YSPH, as a research affiliate, until 1996.

**Nancy Alfred Persily**, M.P.H. '66, died on March 12, 2008, after a valiant struggle with metastatic breast cancer. With a zest for life and an unyielding devotion to her family, friends, colleagues and students, she was a treasured mentor to many. In 1964, Nancy graduated from Cornell University and entered the M.P.H. program at Yale, concentrating on medical care. While at Yale, Nancy had the good fortune of being taught by both Isidore "Issie" Falk, Ph.D. '23, and John Thompson, M.P.H. '50. These professors left a lasting imprint on what Nancy believed could be accomplished through better management of health care, a hallmark of her career. Nancy

began her career at Mount Sinai Medical Center in New York, where she was special assistant to then-President George James and played an integral role in the establishment of the medical school. In 1973, Nancy, her husband and two children moved to Miami, where she taught and developed curriculum at Florida International University from 1974 to 1977. She returned to Mount Sinai, in Miami Beach this time, and held the position of director of planning and marketing from 1977 to 1982. Nancy was an idealist and relished making improvements to management systems.



Through her health care consulting firm, Nancy Alfred Persily Associates, she created an opportunity to focus on strategic planning in myriad health care settings. Her firm provided services to academic medical centers, teaching hospitals, insurance companies, long-term care facilities, universities and government agencies. In 1990, her firm was acquired by Lewin-ICF in Washington, D.C., where Nancy remained as vice president until 1992. Her love for learning led her to accept positions as associate dean at the George Washington University School of Public Health and Health Services and director of the Wertlieb Educational Institute for Long Term Care Management. She was also director of strategic planning and managed care for the medical center until 2001. After nearly 40 years away from her hometown, Nancy returned to Albany, N.Y., in 2002 and served as assistant provost/associate dean for academic affairs at the School of Public Health at the University at Albany with Dean Peter J. Levin, M.P.H. '65.

She was also a clinical professor in the Department of Health Policy, Management and Behavior. Her leadership in the creation of undergraduate majors in public health at George Washington University and the University at Albany received national recognition. Nancy's energy, intellect and passion for life contributed to her efforts to strengthen the overall culture of the University at Albany's School of Public Health, including student interest and involvement. One of her final accomplishments was to create an undergraduate public health program at the University at Albany, an initiative that was important to her because of her efforts to promote a well-trained public health care workforce. Nancy's public health career spanned 40 years, influencing countless public health professionals. Colleagues remember her as paving the way for women in a male-dominated environment. Her enthusiasm and unending energy inspired a shared vision among her colleagues and students. Nancy is survived by her two children, Nathaniel and Meredith, and two grandsons, Aaron and Drew, both named after her late husband, Andrew.

Send obituary notices to [ysph.alumni@yale.edu](mailto:ysph.alumni@yale.edu).





Cushing/Whitney Medical Library, Yale University

## A life dedicated to public health

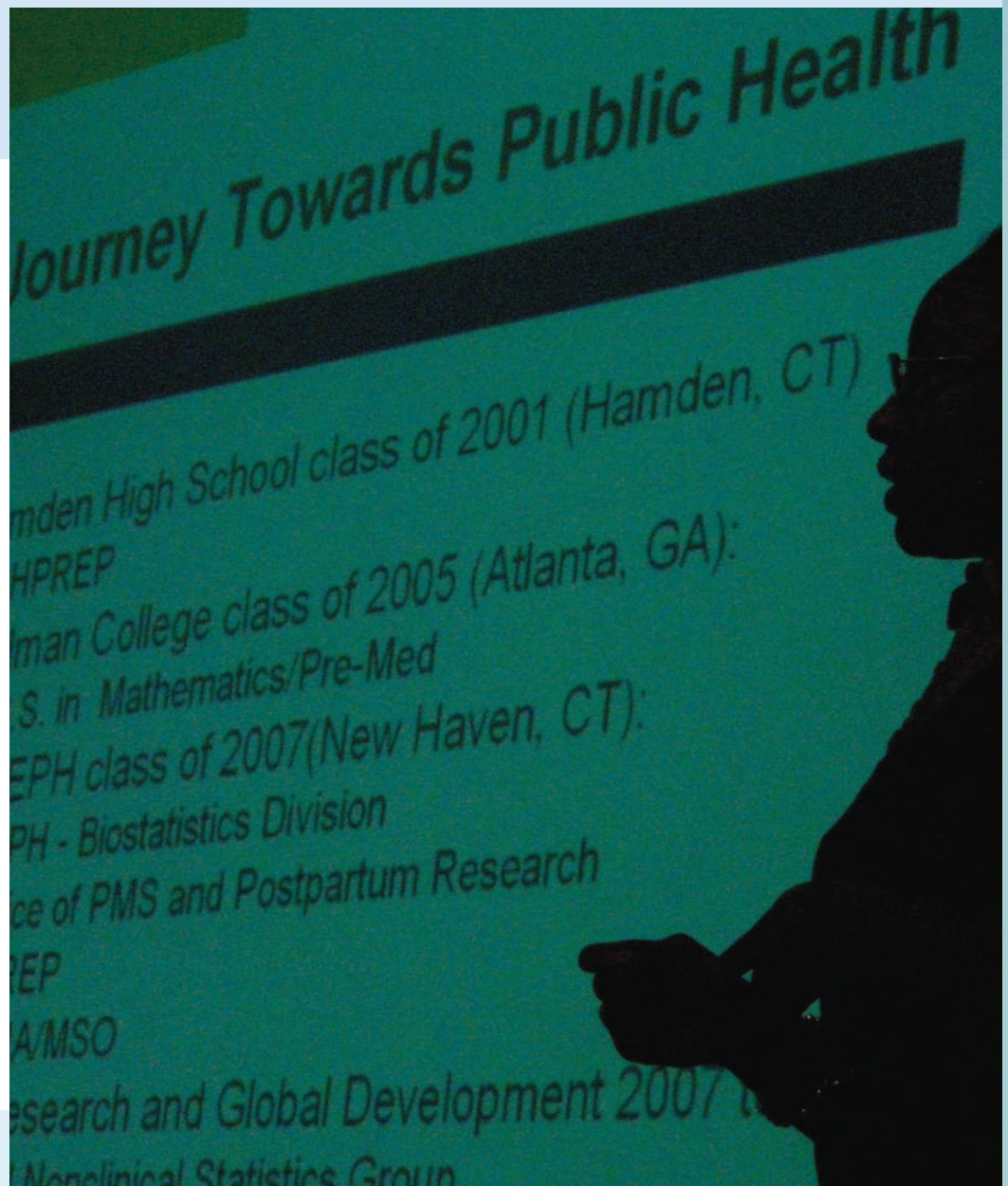
Charles-Edward Amory Winslow (1877–1957) was a giant in the growing public health movement that began more than a century ago. Perhaps his most enduring legacy is the Yale Department of Public Health (today the Yale School of Public Health), which he founded in 1915 and chaired until his retirement in 1945. Winslow also was involved in the creation of the Yale School of Nursing and served as editor of both the *Journal of Bacteriology* and the *American Journal of Public Health (AJPH)*. In later years, Winslow took an active role in New Haven-area housing issues and formulated plans to redevelop dilapidated housing to improve public health.

The *AJPH* honored Winslow's many achievements and his unwavering commitment to public health when he retired from his duties at the magazine in 1954: "The whole globe was his work place. ... Seasoned practitioner, provocative teacher, wise counselor, and revered leader, Winslow has left his impress on many an area and the numbers of the people whom he helped will never be counted."

This photo, date unknown, was given by Winslow to Ira V. Hiscock, his colleague and eventual successor at Yale. The message reads: "Ira V. Hiscock, with affectionate regards and admiration of C-EA Winslow."

*Michael Greenwood*

Today



Melissa Pheterson

## Demystifying public health for minority high schoolers

The Yale School of Public Health's eighth annual Diversity Day touched on seatbelts, *Salmonella* and statistics to give area high school students an idea of the many career paths the field offers.

For 32 teenagers — from Hill Regional Career High School, Hamden High School and New Haven Academy — all of whom belong to the Health Professional Recruitment and Enhancement Program, a national initiative to give select minority students a glimpse into medical education to foster an interest in health care, the event was an eye-opener.

"I'm walking away today having learned so much about public health," said Christian Bahamon, a senior at Hamden High. "You might see doctors on the front lines, but it's fascinating to see how public health specialists work behind

the scenes to make sure the entire system runs smoothly. Today was a great experience."

Alumna Maya Hanna, M.P.H. '07 (pictured), recounted for the students how her own interest in public health unfolded and led to a job as a statistician at Pfizer. Six current students at the School of Public Health — with home countries as diverse as Colombia, Nigeria and the Bahamas — also discussed the paths that led them to Yale, encouraging the younger students not to let financial hardship and other obstacles dissuade them from applying to public health programs or pursuing opportunities in health care.

Melissa Pheterson



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