

# Yale Public Health

FALL 2013  
FALL 2009

How healthy  
are our homes?

- Flame retardants
- A holistic approach
- Food safety
- Fighting Lyme disease
- The end of an era

Yale SCHOOL OF PUBLIC HEALTH



# Yale Public Health

FALL 2013

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## Dean's Message

### Better health starts at home

It is no secret that our environment affects our health. However, when we think of environment, we usually consider the air we breathe or the water we drink. Most of us do not give much thought to the ways in which one of the most important parts of our environment – our homes – shape our health.

In this, our 10th issue of *Yale Public Health*, we explore the pioneering research conducted by Yale School of Public Health scientists to make the places where we live healthier and safer. These researchers are seeking to answer essential questions – whether and how chemicals, additives, pathogens, disease vectors and other sources affect our health.

One of our faculty, Dr. Yawei Zhang, is seeking to understand whether flame retardants, substances that are liberally applied to many of the products in our homes, are related to a sharp increase in thyroid cancer, particularly among women, and are causing developmental problems in children. Flame retardants, of course, are meant to protect us from fire, and thus they serve a vital purpose and undoubtedly have saved lives. But repeated, close exposure to the powerful chemicals used for this purpose may have unintended, harmful consequences that we are only now starting to recognize. Two of her studies now under way could provide crucial answers about such potential risks.

Our homes are the places where most of us feel safest and most comfortable. But our living environments can also pose serious threats to our well-being. It is essential that houses of the future be constructed with human health as a central design feature.

Years ago, substances such as lead were commonly used throughout houses with little awareness of their serious side effects. We now know the harm that exposure to even small amounts of lead can cause, and the government has rightfully taken decisive action to restrict its use. Even with this intervention, lead exposure still poses a significant health threat.

Dr. Adrienne S. Ettinger, who joined our faculty a few years ago, brings with her a wealth of experience and expertise on this important topic and shares some of her insights with us in this issue. In addition to lead, she is looking at homes and health more holistically, collaborating with colleagues at Yale and elsewhere on what constitutes a healthy home and how we can start achieving this ideal.

Health threats also come from the food we eat and from the insects and wild animals that inhabit our lawns and recreation areas. The Connecticut Emerging Infections Program at YSPH is actively working to minimize the threat from these sources and others. They monitor, record and investigate food-related diseases and work with health officials at the state and federal levels so that contaminated foods are removed as swiftly as possible. Meanwhile, they are also researching an approach to fighting Lyme and other tick-related diseases.

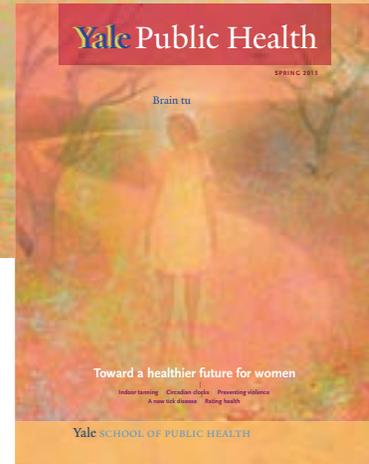
Better health is a goal that we all share, and our researchers are making important contributions so that we may all live happier and healthier lives – in our homes.

*Paul D. Cleary, Ph.D.*  
*Dean, Yale School of Public Health*

“Our homes are the places where most of us feel safest and most comfortable. But our living environments can also pose very serious threats to our well-being.”

## Editor's Note

### YSPH research helps change state law



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#### Dean

Paul D. Cleary, Ph.D.  
*The Anna M.R. Lauder Professor of Public Health*

#### Managing Editor

Michael A. Greenwood

#### Web Coordinator

Denise L. Meyer

#### Copy Editor

Anne Sommer

#### Design

AH Design, Angie Hurlbut  
NYM Design, Nilou Moochhala

#### Address correspondence to

Managing Editor, *Yale Public Health*  
47 College Street, Suite 104  
P.O. Box 208034  
New Haven, CT 06520-8034  
Phone: 203-737-5151  
Fax: 203-785-7296  
E-mail: [michael.greenwood@yale.edu](mailto:michael.greenwood@yale.edu)  
Web: [publichealth.yale.edu](http://publichealth.yale.edu)

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For minors who engage in indoor tanning, the habit will be a little more difficult in Connecticut starting this fall.

Gov. Dannel P. Malloy this past summer signed into law a measure that makes it illegal for people under 17 years old to use indoor tanning facilities (see picture of bill signing on page 57).

The new law was prompted in part by scientific research, published in 2012 and led by the Yale School of Public Health, that found a strong link between even moderate amounts of indoor tanning and the risk of basal cell carcinoma (BCC), a form of skin cancer. The finding added to the evidence that the powerful ultraviolet rays used during indoor tanning can trigger melanoma, a potentially deadly form of skin cancer.

The Yale research, featured in the Spring 2013 issue of *Yale Public Health*, surveyed some 800 people under age 40 in Connecticut (half with skin cancer, half without) and found that indoor tanning was associated with a 69 percent increased risk of BCC. More than 80 percent of the females under age 40 who had skin cancer had tanned indoors, mainly in commercial tanning facilities. Furthermore, the study concluded that nearly half of early-onset BCCs in women could be avoided if they never tanned indoors.

“Passage of this legislation accomplishes two things. It protects Connecticut minors from early-life exposures that are now recognized as cancer-causing. It also sends a strong message to adults that indoor tanning is a recognized health risk,

countering some of the misinformation put forth by the industry,” said Susan T. Mayne, the C.-E. A. Winslow Professor of Epidemiology and a cancer epidemiologist at the Yale School of Public Health. Mayne was the senior epidemiologist on the study and testified on the bill's behalf in March during a public hearing in Hartford. She collaborated on the study with a number of colleagues from the Yale schools of public health and medicine.

The Public Health Committee of the Connecticut General Assembly noted that the Yale study was instrumental in passing the legislation this year (similar bills had failed in previous years).

The governor, meanwhile, congratulated lawmakers, scientists and advocates for their combined work on legislation that will help to protect Connecticut's youth.

Dean Paul D. Cleary also commended the new public health legislation.

“I was absolutely delighted when I heard that Governor Malloy had signed the bill banning indoor tanning for minors,” he said. “This is a perfect example of how collaborative research and dissemination efforts can translate scientific findings into policy that will improve the health of our communities.”

*Michael Greenwood*  
Managing Editor

## Social media as a platform for ageism

At the same time that Facebook is revolutionizing the way that people communicate, recent research shows that it also provides a platform for the enduring problem of negative age stereotypes.

Investigators led by Becca Levy, Ph.D., associate professor and director of the Social and Behavioral Sciences division at the Yale School of Public Health, analyzed the site descriptions included on publicly accessible Facebook groups that focused on older persons. The sites were created by younger persons, mainly between the ages of 20 and 29, and had more than 25,000 combined members.

All but one of these descriptions included negative age stereotypes, with the majority describing older persons as mentally or physically incompetent, or both.

The elderly were vilified on three-quarters of the Facebook sites examined. In some cases, executing the aged was proposed. One Facebook group description, for example, stated that anyone “over the age of 69 should immediately face a firing squad.”

Over a third of the sites advocated banning older persons from public activities. The activities mentioned most were shopping and driving. Additionally, on one-quarter of the sites, the elderly were portrayed as infantile. In these cases, they were described with such phrases as “a smaller, younger child.”

The study is believed to be the first on age stereotypes that appear on social networking sites. “Facebook has the potential to create new connections between the generations,” said Levy. “Instead, it may have created new obstacles.”

The study originally appeared in *The Gerontologist*.

Michael Greenwood

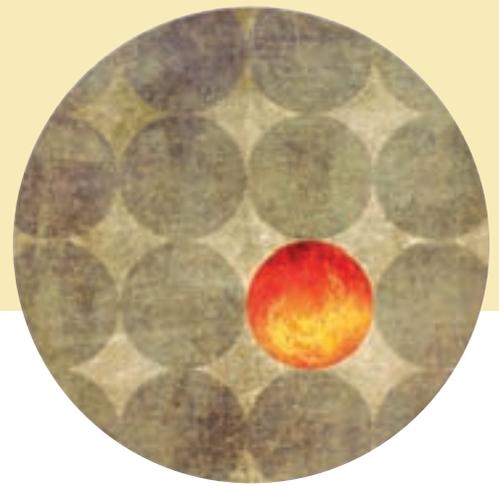
## Infection replicated in laboratory setting

Yale scientists for the first time replicated in a laboratory setting the process of becoming infectious that occurs in the parasite that causes trypanosomiasis, more commonly known as African sleeping sickness.

The accomplishment, which researchers hail as a breakthrough, could lead to a better understanding of the molecular mechanisms by which the pathogen acquires infectivity and might eventually result in studies that block the transmission of the disease.

The discovery will also allow scientists to replicate and study the development of infectivity outside the tsetse fly vector. Previously, the pathogen had to be propagated in the fly and extracted, a cumbersome and expensive procedure.

*Trypanosoma brucei*, the parasite responsible for the deadly disease that



afflicts thousands of people in rural regions of sub-Saharan Africa, undergoes a complex life cycle between the mammalian host and the blood-feeding tsetse fly. The significance of the tsetse fly vector in the transmission of African trypanosomes was first documented over a century ago, but many aspects of trypanosome biology in the insect vector remain shrouded in mystery.

Yale scientists and colleagues from Rockefeller University discovered that, by overexpressing an RNA-binding protein known as RBP6 in cultured noninfectious cells, they triggered a previously unknown cascade of events leading to infection of the parasite. Molecules like RBP6 have been postulated to regulate gene expression in trypanosomes, but this is the first study to identify a master regulator.

“Serendipity happens in science,” said lead researcher Christian Tschudi, Ph.D., professor in the Department of Epidemiology of Microbial Diseases. The research appeared in *Science*.

Denise Meyer

## Veterans perform well as long-term caregivers

Caregiving can be both stressful and rewarding. One in five older American veterans, many of whom once served in a war zone and some who suffered trauma there, are now filling this role. But does their battlefield experience make caregiving harder – or, perhaps, easier?



Michael Woloshchirrow (3)

To better understand what older veterans experience when providing long-term care for a family member or friend, Joan K. Monin, Ph.D., assistant professor in the Social and Behavioral Sciences division, drew upon a nationwide survey of 2,025 veterans over age 60. Of this group, 431 were caregivers and more likely to be educated, married and male. The researchers asked veteran caregivers questions about their physical and mental health and asked them to estimate the physical and emotional strain they felt while caregiving.

The veterans with combat experience, it turned out, found caregiving less emotionally burdensome than did those who never served on a battlefield. That resilience may arise from post-traumatic growth, a phenomenon of improved psychological well-being after trauma that includes warmer interpersonal relationships and, in veterans, high generativity, or an increased interest in a world beyond the self and a desire to contribute to future generations.

Caregiving can be a path to generativity, especially where young grandchildren are concerned—and, indeed, these veterans were more likely to call caring for grandchildren versus other family members “very rewarding.” But this task was also a greater physical strain. The authors suggested that a Veterans Affairs initiative aimed at helping veterans’ caregivers might benefit veteran caregivers, too.

The research was published in *The American Journal of Geriatric Psychiatry*.  
Jenny Blair

## Curbing South Africa’s AIDS epidemic

A portfolio of partially effective interventions used in concert could dramatically reduce HIV incidence in South Africa, home to the largest epidemic in the world.

A YSPH analysis used mathematical modeling to evaluate the potential impact and cost-effectiveness of a range of interventions to combat HIV



in South Africa, where an estimated 5.6 million people are currently infected with the virus.

Elisa F. Long, Ph.D., formerly an assistant professor at the Yale School of Management and the School of Public Health, and colleagues examined whether a combination of newer biomedical approaches, including voluntary male circumcision, oral pre-exposure prophylaxis and vaginal microbicide gel—each of which is only modestly effective on its own—along with expanded HIV screening and use of antiretroviral therapy could effectively slow the spread of the disease.

The researchers found that the portfolio approach has the potential to avert up to two-thirds of new HIV

infections in South Africa, reducing the virus’ prevalence from a projected 14 percent to 10 percent after 10 years and preventing more than 2 million new infections over this time period.

The researchers also concluded that the combination strategy would add a total of 31 million life years to the population and that its implementation would be cost-effective in a setting such as South Africa.

“Our study’s aim is to help policymakers better allocate limited HIV resources in a way that maximizes overall health benefits,” said Long.

The study appeared in the *Journal of General Internal Medicine*.

M.G.

## HPV infections and geography linked

Invasive cervical cancer begins with the common human papillomavirus (HPV), and some strains are more dangerous than others. HPV types 16 and 18 cause about 70 percent of all cases of cervical cancer worldwide and about half of high-grade cervical lesions, a cancer precursor, so it’s these two carcinogenic types that are covered by current HPV vaccines.

But which HPV type infects people depends partly upon who they are and where they live. A group of researchers led by Linda M. Niccolai, M.Sc., Ph.D., associate professor in the Department of Epidemiology of Microbial Diseases, has found that women with high-grade cervical lesions who are black or Hispanic or who live in poor neighborhoods are less likely to be infected with HPV type 16 or 18. Yet it’s these very populations that are most affected by higher mortality from

cervical cancer. In other words, the vaccine may be of less benefit to the women who need it most.

Using a statewide surveillance system set up by the Connecticut Department of Public Health and the Connecticut Emerging Infections Program, researchers checked the HPV type in the lesions of 832 young unvaccinated women. They compared that information not only to individual measures of race, ethnicity and income but also to geographic data capturing the women's socioeconomic milieus. The study took place as part of a larger Centers for Disease Control and Prevention effort to monitor the HPV vaccine's impact nationwide; results appeared in the journal *Cancer*. In an accompanying editorial, the public health significance of this unique data source was described as "invaluable," and the research team plans to continue its monitoring efforts.

Vaccinating against HPV types 16 and 18 is an important first step, the authors concluded, though targeted vaccination efforts may also be necessary. Health professionals must use additional means of preventing cervical cancer in more vulnerable populations or risk seeing disparities widen. A new 9-type vaccine, which may further help to address the current disparities, is in the pipeline.

Jenny Blair

## Strategies to reduce hospital readmissions

One in five Americans on Medicare now returns to the hospital within 30 days of discharge. The cycle drives up medical bills and adds to the burden on health care systems.

A new Yale-led study suggests that there are cost-effective ways to prevent this from happening for many patients, particularly those suffering from heart failure.

Hospital readmissions for older patients cost American taxpayers more than \$15 billion per year. But the researchers found that only 30 percent of the hospitals they surveyed were taking measures to prevent these readmissions and reduce costs.

The YSPH-led team surveyed nearly 600 hospitals and identified six strategies for reducing readmissions: partnering with community physicians; partnering with local hospitals; assigning responsibility for medication reconciliation to nurses; sending patients home from the hospital with an outpatient follow-up appointment already made; having a process in place to send all discharge or electronic summaries directly to the patient's primary care physician; and assigning staff to follow up on test results after the patient is discharged.

The researchers found that the reduction in readmissions was greater when more of these strategies were implemented.

Led by Elizabeth H. Bradley, Ph.D. '96, professor in the Department of Health Policy and Management, the study focused on patients with heart failure due to the higher readmission rates among this group.

"It was surprising that only 7 percent of hospitals were implementing all six of the strategies, even though reducing readmissions is a national priority," said Bradley.

The study appeared in *Circulation: Cardiovascular Quality and Outcomes*.

Michael Greenwood



Michael Woloschinow

## Clean syringes scarce in St. Petersburg

Russia's HIV epidemic is among the fastest-growing in the world, and injection drug users who often share needles and other supplies are hardest-hit. This occurs even though pharmacies are a legal source for clean syringes and can sell them without restriction.

A recent study led by the Yale School of Public Health and Saint Petersburg State University mapped the city's 965 pharmacies and compared their locations and density to HIV prevalence at the district level.

While an association between pharmacy location and HIV rates was not identified, the researchers discovered that many pharmacies did not offer syringes for sale, did not have them in stock or outright refused to sell them. The researchers visited all of the pharmacies in two of the city's districts.

"The HIV epidemic, especially among people who inject drugs, is as much a disease of social structures as it is a disease transmitted by individual behaviors. When syringes are unavailable because of prejudice against drug users, the users are likely to resort to risky practices such as sharing syringes," said Robert Heimer, M.Sc. '80, Ph.D. '88, professor in the Department of Epidemiology of Microbial Diseases.

M.G.

## Perspective

### Flame retardants

## Widely used chemicals are a poster child for the problem of regrettable substitutions.

By Elizabeth Grossman

One of the more vexing problems of the United States' chemical regulation system is that of "regrettable substitutions" – the replacement of one hazardous chemical product with another.

This problem exists because we regulate chemicals individually and under a regulatory regime that allows chemicals into commercial production without thorough information about their environmental and human health effects. That we have come to rely on chemical lists to determine product safety exacerbates this problem. Examples abound, but a category of chemicals that could be the poster child for regrettable substitutions is flame retardants.

Chemical manufacturers date the use of flame retardants in textiles back to the 18th century. But as plastics, synthetic textiles and polyurethane foam products proliferated, particularly beginning in the 1970s, so did the use of chemicals to make these inherently flammable materials less likely to burst into flame. Because bromine and chlorine – elements called halogens – are effective at preventing combustion, these elements have been incorporated into many flame-retardant chemicals, giving rise to compounds known as halogenated flame retardants.

Since the 1970s, scores of halogenated flame-retardant products have been introduced – including about 75 different brominated flame retardants (BFRs) – and used in products ranging from children's sleepwear to high-tech electronics and upholstery foam. Many such compounds have been identified as environmental and human health hazards and taken off the market – either through regulation, voluntarily or under phase-out agreements with regulatory agencies. But many flame retardants introduced to replace those withdrawn have later been found to have adverse environmental health effects – impacts often comparable to those of previously used compounds.

The list of such BFRs could begin with the polybrominated biphenyls (PBBs), introduced in the 1970s and used in plastics and textiles. PBBs were discontinued in the United States in the mid-1970s after some 2,000 pounds were mistaken for animal feed in Michigan, exposing thousands of farm animals and many people. PBBs are environmentally persistent, can accumulate in fat tissue and are "reasonably anticipated to be human carcinogens." They have been identified as toxic to the nervous system, liver, kidney and thyroid; can cause skin disorders; and act as endocrine disruptors.

The polybrominated diphenyl ethers (PBDEs) that largely replaced PBBs are also environmentally persistent, lipophilic and bioaccumulative. PBDEs have been identified as endocrine disruptors with potential adverse impacts on the thyroid, nervous system, liver, kidney and skin. Some PBDEs have also been linked to birth defects and cancer. By 2005, the PBDEs considered most hazardous were being phased out.

Another BFR used in plastics and foams following PBBs is hexabromocyclododecane (HBCD). It too, is environmentally persistent, bioaccumulative and lipophilic, with potential adverse neurological, developmental, reproductive and endocrine hormone effects. Like PBDEs and PBBs, HBCD has been found in human blood, breast milk and fat tissue.

Yet another BFR widely used in plastics – particularly electronics – is tetrabromobisphenol A (TBBPA), also found to be environmentally persistent, lipophilic and with adverse endocrine hormone, immune system and blood cell impacts. A more recently introduced flame retardant, Firemaster 550, has – like PBBs, PBDEs and TBBPA – been found in household dust and sewage sludge and identified as an endocrine disruptor with potential adverse cardiovascular, developmental and neurological effects.

There is a similar succession of chlorinated flame retardants. In 1977, one such compound was found to be potentially carcinogenic and was banned from use in children's sleepwear in the United States. Yet similar flame

*Continued on page 63*



Michael Sloan

# Home sweet home?

Nine ubiquitous household toxins can exact a heavy toll on one's health.

## 1. Di phthalates

medical devices and tubing, wall coverings, tablecloths, floor tiles, upholstery, shower curtains, garden hoses, toys, rainwear, shoes

**endocrine, reproductive and developmental problems**

## 2. Combustion byproducts

**(carbon monoxide, nitrogen oxides & particles)**

leaking furnaces, chimneys, gas stoves, wood stoves, fireplaces; back-draft from gas water heaters; auto exhaust from attached garage or nearby traffic

**cardiovascular and respiratory (i.e., asthma) problems; nervous system failure**

## 3. Volatile organic compounds (VOCs)

air fresheners, hair spray, perfumes, cleaning products, paints, carpets, furniture made out of pressed wood

**reproductive, respiratory, neurological and developmental problems; also linked to cancer**

## 4. Perfluorinated chemicals (PFCs)

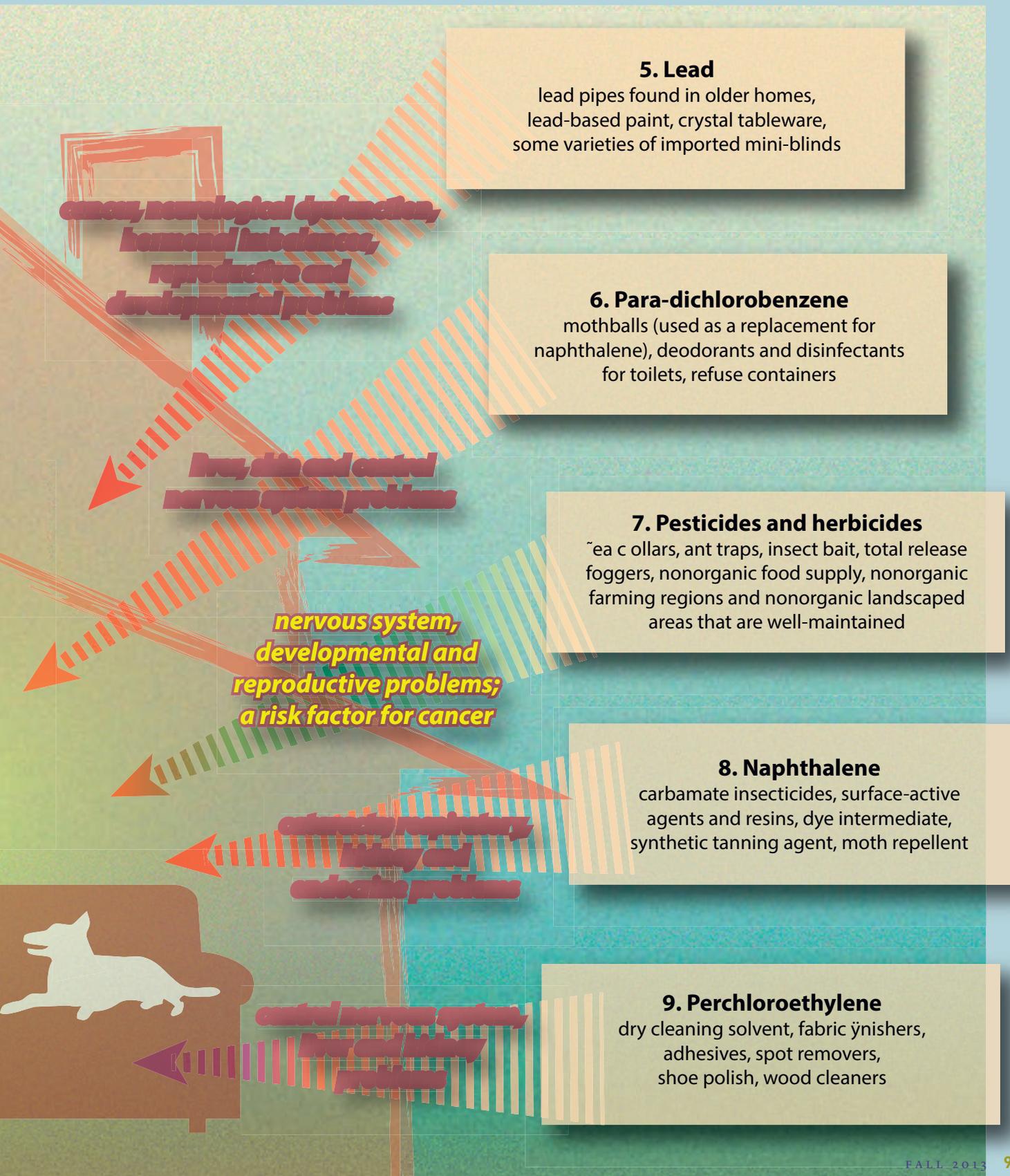
teflon-coated cookware, microwave popcorn bags, stain-guarded clothing, furniture and carpets

**cancer and developmental problems**



In May 2013 a bipartisan bill, the Chemical Safety Improvement Act, was introduced in Congress to reauthorize and modernize the Toxic Substances Control Act. Should the bill become law, it will empower the Environmental Protection Agency to evaluate all existing chemicals and to take action against unsafe compounds.

Sources: Environmental Protection Agency, Food and Drug Administration, Agency for Toxic Substances and Disease Registry



“There are thousands of new chemicals  
being generated all the time.”

—Yawei Zhang

# Flame Retardants

Flame retardants are meant to keep people safe, but the powerful  
chemicals may be causing cancer and other diseases.

By Steve Kemper

While flame retardants have an important public safety goal—to slow or stop the spread of fires—there is growing concern that the chemicals may have unintended health consequences for humans.

Flame retardants are everywhere around us. Governments require manufacturers to put these chemicals into our rugs, cars, furniture, curtains, mattresses, pillows and even many items of apparel, especially for infants. It's hard to name an item that doesn't contain them. They're in cell phones and computers, stereos and televisions, coffee makers and microwaves. They are supposed to keep us safe by preventing products from bursting into flame and causing dangerous fires.

But evidence is mounting that this prevention carries unforeseen costs for human health. For the last several decades the chemicals used in most flame retardants have come from a class of compounds called polybrominated diphenyl ethers (PBDEs). Data from animal studies and several human studies have linked PBDEs to a host of biological and neurophysical ailments, including disruptions in the endocrine glands (including the thyroid), decreased fertility in women, lower birth weights and developmental problems in children.

Because PBDEs interfere with the production of essential thyroid hormones, researchers have started to explore whether these chemicals are implicated in the rising incidence of thyroid cancer. That question will be partly answered in two studies now under way by Yale epidemiologist Yawei Zhang, M.D., M.P.H. '03, Ph.D. '04, associate professor in the Department of Environmental Health Sciences.

### The rise of thyroid cancer

The first investigation, a population-based case-control study, will look for links between PBDEs and the risk of thyroid cancer using all cases of thyroid cancer diagnosed in Connecticut in 2010 and 2011 and age- and gender-matched general populations in Connecticut. The second and more extensive project is a longitudinal study in collaboration with the Centers for Disease Control and Prevention and the Department of Defense (DOD). Using serum from the DOD Serum Depository, Zhang and her colleagues hope to trace the role of PBDEs in the development of thyroid cancer in 800 cases and 800 controls between 2000 and 2012.

"Thyroid cancer was once very rare," says Zhang, "with only five cases per 100,000 person-years. But in the last 20 years it has increased to almost 15 cases per 100,000. No other cancer shows such a rapidly increasing trend." This is especially bad news for women, she adds, since thyroid cancer hits them three times as often as men. It has become the fifth most common cancer among women. The causes remain unknown, another factor that motivates Zhang's research.

The surge in thyroid cancer seems to overlap with the introduction and proliferation of PBDEs. These compounds now show up in the blood of about 97 percent of the U.S. population, including newborns, and at levels 10 times higher than in Europe. The highest levels in the United

States – twice the national average – are found in Californians. The reasons lie in the history of PBDEs.

In the mid-1970s California decided to protect its citizens from accidental fire by requiring that all furniture and household products sold in the state be capable of resisting an open flame for 12 seconds. Manufacturers began suffusing products bound for California with flame retardants, mainly PBDEs. Other states followed California's lead, passing similar though less-stringent mandates. European countries added their own versions. Faced with this variety of regulations, manufacturers simply saturated all household products with enough flame-retardant chemicals to satisfy the strict standard in the major market of California.

The production of PBDEs skyrocketed to meet consumer demand for new fireproof couches, office furniture, mattresses and cribs. Over the next three decades PBDEs became pervasive in households and offices throughout the country. And not in mere trace amounts – a couch with foam cushions might be saturated with up to two pounds of flame retardant.

PBDEs began showing up in blood tests and even in the milk of new mothers. In the 1980s, that led researchers to begin investigating the chemicals, mostly through animal models. They wanted to know how PBDEs got into humans, why they were so prevalent and what their health effects might be.

Between the 1970s and the early 2000s, three kinds of PBDEs were being used, named after the number of

neurodevelopmental disorders, as well as toxicity in the thyroid and liver. OctaBDE, used mostly in plastics, textiles and nylon, had similar effects. Other studies showed that the compounds accumulated in human breast milk and were passed on to infants.

These alarming findings eventually led to government action. In 2004 the European Union banned penta- and octaBDE. California banned pentaBDE that same year. Ultimately eight states outlawed penta- and octaBDE. In 2009, the two compounds were put on the Stockholm Convention's list of persistent organic pollutants (POPs), joining other notorious POPs (and known carcinogens) such as polychlorinated biphenyls (PCBs) and dichlorodiphenyl-trichloroethane (DDT). Production of penta- and octaBDE ceased.

But that did not mean the end of them or their consequences for human health. "Like other POPs," says Zhang, "these chemicals are very persistent in the environment and they also bioaccumulate." That is, they collect in the body and linger there. In humans, the half-lives of PBDEs range from two to 12 years.

### The role of PBDEs

PBDEs get into humans in two ways – ingestion and inhalation. The compounds now appear in every corner of the world and are almost impossible to avoid – in 2004 it was reported that they were found in Arctic polar bears. So it's



“[Thyroid cancer] has become the fifth most common cancer among women. The causes remain unknown.”

–Yawei Zhang

Flame retardants are frequently added to a wide variety of consumer products, including mattresses, furniture and curtains. The compounds used to create flame retardants are now found in the blood of most Americans.

bromides in them: pentaBDE, octaBDE and decaBDE. PentaBDE, prevalent in polyurethane foams for furniture, mattresses and carpet padding, was the most widespread. Research suggested that it was also the most toxic. In animal studies pentaBDE caused reproductive and

not surprising that they have infiltrated our food supply. Fatty fish such as tuna and salmon bioaccumulate PBDEs, and when we eat them, they pass on part of their chemical load. Livestock also bioaccumulate PBDEs, which we absorb through fatty meats and high-fat dairy products. But the main source – a recent estimate is 80 percent – seems to be our household and office furnishings. PBDEs leach out of them and stick to ambient dust, which we inhale. Crawling infants get this contaminated mixture on their hands

and transfer it to their mouths, which probably accounts for the high levels often found in small children.

The biological consequences of PBDEs were demonstrated in animal studies beginning in the 1980s. More recently these effects have been found in humans, particularly children. Researchers in Spain (2011), the Netherlands (2009), New York (2010) and California (2013) have reported similar results: young children exposed in utero to PBDEs later show neurobehavioral impairments in their attention, cognition and motor skills—similar to the effects reported for prenatal exposure to PCBs, which are chemically similar to PBDEs.

This is where the thyroid comes in. In pregnant women, the hormone produced by the thyroid is crucial to the normal development of the unborn infant's brain. If something disrupts or interferes with this hormone, and hence with the proper growth of the brain, the result is neurodevelopmental problems. In animal and human studies, PBDEs have been shown to disrupt thyroid function and cause thyroid toxicity. Further, studies demonstrate that PBDEs can cross the blood-placenta barrier and the blood-brain barrier. Since the period of "rapid brain growth" in infants lasts from the third trimester of pregnancy to at least age two, their developing brains may get years of continuous exposure to PBDEs through the placenta, breast milk and contaminated floor dust.

These findings caught Zhang's attention, especially the connection between PBDEs and hormone interference, an area of special interest for her. Zhang came to Yale in 1999 from China, where she worked as a preventive medical doctor. After getting her advanced degrees here, she spent a year as a postdoc at the National Cancer Institute, working on hormone issues and chemicals related to cancer. She joined the Yale faculty in 2005.

"PBDEs seem to mimic the thyroid hormone and disrupt thyroid homeostasis," she says. "That can cause tumors. That's why we proposed this hypothesis linking PBDEs and thyroid cancer. I would like to find the risk factors responsible for the increasing trends for this disease."

The known risk factors are radiation, family history and excessive consumption of iodine, but these account for only a small percentage of thyroid cancer cases. The majority remain unexplained, thwarting prevention. That's why Zhang and others want to investigate PBDEs.

"It just makes a lot of sense to look into this," says Jennifer A. Rusiecki, M.P.H. '98, Ph.D. '02, associate professor of epidemiology at Uniformed Services University of the Health Sciences in Bethesda, Md. (The school is run by the U.S. government and is devoted to military and public health medicine.) Rusiecki and Zhang know each other from YSPH. Both have researched links between environmental factors and cancer. They jumped at the idea of collaborating on PBDEs and thyroid cancer.



Studies have determined that young children exposed in utero to PBDEs later show neurobehavioral impairments in their attention, cognition and motor skills—similar to the effects reported for prenatal exposure to PCBs, which are chemically similar to PBDEs.



“The production of PBDEs almost doubled between 1992 and 2001,” notes Rusiecki, “and that parallels the recent dramatic change in thyroid cancer incidence. When you account for the latency period of five to 20 years necessary to develop the cancer, it’s a very sensible hypothesis that there may be a link.” She and Zhang co-designed the study, which will be based on samples from the DOD Serum Depository, which Rusiecki can access. The National Institutes of Health is funding the project.

Since the 1980s, everyone in the military, including reservists, has been tested for HIV every two years. The leftover serum goes to the Serum Depository, which contains an estimated 50 million samples. For researchers interested in long-term changes in individuals, the depository is a trove of invaluable data. Zhang and Rusiecki will cross-check the serum data with data from the military’s tumor registry. To investigate the effects of PBDEs over time, they will identify 800 people who went from a clean diagnosis to thyroid cancer. These 800 samples will be sent to a lab at the Centers for Disease Control and Prevention, which will analyze them for PBDEs.

“It’s a great opportunity to see if a high level of exposure to these chemicals is associated with the development of the cancer,” says Rusiecki. Another 800 people who did not develop thyroid cancer will function as controls.

No definitive correlation has yet been found between PBDEs and thyroid cancer. That doesn’t surprise Mary H. Ward, M.S., Ph.D., a senior investigator in the Division of Cancer Epidemiology & Genetics at the National Cancer Institute. She has studied environmental risk factors for various cancers, including thyroid cancer, and she notes that there is usually a lag between chemical exposure and carcinogenesis. She believes the time is ripe to look for links between PBDEs and thyroid cancer, and she will be part of the team assisting Zhang and Rusiecki. “We’re right at the point where we can start to evaluate this,” she says. “Ten years ago was probably too early, because the chemicals weren’t at the levels we needed.”

If Zhang and her colleagues find correlations between thyroid cancer and a person’s level of PBDEs, the next step will be to discover the mechanism that leads to carcinogenesis. A few possibilities have been proposed but not definitively demonstrated, except in animal models. Researchers know that the chemical structure of PBDEs resembles that of thyroid hormones, allowing PBDEs to mimic thyroid hormone function. “These chemicals may be competing with the thyroid hormones,” say Zhang, “binding to the thyroid transporter proteins and getting delivered to all the different organs where there are thyroid hormone receptors.” But since PBDEs are imposters, they disrupt the proper functioning of the system.

Another possibility, says Zhang, is that PBDEs may cause the thyroid to go haywire. For instance, they may interfere with the hypothalamic-pituitary-thyroid axis,



Rates of thyroid cancer have risen sharply in the past 20 years, particularly among women. A Yale School of Public Health researcher is studying whether the compounds used in flame retardants, commonly added to household products, play a role in the increase.

which regulates metabolism. If PBDEs upset thyroid hormone homeostasis, cells in the thyroid may proliferate wildly, setting the stage for cancer.

As part of the DOD Serum Depository study, Zhang and Rusiecki intend to do DNA analysis to see whether specific genes are linked to PBDEs and the risk of thyroid cancer. They want to know whether certain genotypes metabolize the compounds differently and are more susceptible to the disease. Because of the project's scale and complexity, Zhang doesn't expect to have all the results until 2015.

## New compounds

The one PBDE still in use, decaBDE, is scheduled to be voluntarily phased out of production in the United States by the end of this year. Its effects on human health, however, will persist while the compound migrates out of the products that contain it.

Manufacturers will replace decaBDE, as they replaced penta- and octaBDE, with new compounds whose consequences for human health vary from damaging to unknown. For instance, when penta- and octaBDE were banned, some manufacturers quietly returned to an older compound called chlorinated tris (or TDCPP) to flameproof products containing polyurethane foam. When researchers and officials eventually realized this, they were shocked, since TDCPP had been voluntarily withdrawn as a fire retardant three decades earlier after it was linked to cancer and labeled a cancer risk by the National Cancer Institute and the World Health Organization. The chemical also has been linked to damage of the liver, kidneys and brain. But since TDCPP was never outlawed, companies didn't have to inform the government or consumers that car seats, nursing pillows and crib mattresses were being doused with the chemical. In the continuing absence of federal action, several states recently acted to ban or strictly regulate products containing TDCPP.

The other replacement for pentaBDE was a brominated compound called Firemaster 550. In 2003 the manufacturer and the U.S. Environmental Protection Agency (EPA) assured the public that, unlike pentaBDE, Firemaster 550 did not leach from products and would not bioaccumulate in humans.

Within a few years Firemaster 550 began showing up all over the globe, in oceans, animals, household dust and even sewage, from the Arctic to the South China Sea, from San Francisco Bay to the coast of Maine. Since Firemaster 550 seems to be bioaccumulating in porpoises, mollusks and harbor seals, among other animals, researchers began to suspect that it's also sticking around in humans. In early 2012 the EPA announced that it was reviewing Firemaster 550 as a potential health hazard. In late 2012, the first study of Firemaster 550's health effects, by researchers at Duke and North Carolina State, found that the compound is an endocrine disruptor in animals and seems to be passed on to infants through the placenta or breast milk or both.

Why are these harmful chemicals allowed into products? The answer goes back to the nation's antiquated Toxic Substances Control Act, now nearly 40 years old, which doesn't give the federal government much power to control chemicals in consumer products. Manufacturers don't have to prove that a new compound is safe and don't need the EPA's permission to put it into nonfood products. The government can't even require manufacturers to reveal the ingredients in these



The compounds used in flame retardants are so widespread that they are found in most parts of the world and have even been detected in Arctic polar bears.

compounds; the law allows manufacturers to shield such information as proprietary. "Because many of them are commercially secret," notes Zhang, "scientists have no way of testing them."

Even if a chemical is shown to damage human health, the federal government can do little. The 1976 law requires the EPA to prove that the chemical represents an "unreasonable risk" — a legal standard so difficult to meet that the EPA failed to ban asbestos, a clear health hazard and carcinogen. If big-market states such as California outlaw a compound such as pentaBDE, manufacturers simply switch to a new one. Researchers and epidemiologists are always playing catch-up.

"There are thousands of new chemicals being generated all the time," says Zhang. "But if they're not for human food, they're just put into production. Even if they're later banned in some places, they're often so environmentally persistent and bioaccumulative that the general population will continue to be exposed to them for quite a long time. Before they are put into consumer products," she adds, "we really should have some toxicology study results that demonstrate that they are safe for human health." YPH

*Steve Kemper is a freelance writer in Connecticut.*



## **A researcher with a background in lead poisoning takes a holistic approach to safer, healthier living environments.**

By Jenny Blair

When Adrienne S. Ettinger started her first job out of graduate school in public health in 1991, there were an estimated 1.7 million American children with high levels of lead in their blood.

Ettinger would know. She went looking for them in inner-city New Jersey, knocking on doors and asking residents to join studies on home cleaning for lead dust—studies that could help protect children living there. She recalls being struck by people’s openness and willingness to participate.

“It was really amazing how these people would let us into their homes and in on every detail of their lives,” says Ettinger, M.P.H., M.Sc., Sc.D., assistant professor in the Department of Chronic Disease Epidemiology. “Your home is your safe place.”

Except, of course, when it isn’t. Many of us are menaced at home not only by lead but also by toxic gases, allergens and worse.

Such hazards are Ettinger’s specialty. In a long career as an environmental epidemiologist, she has focused on housing-related hazards, grappling with substances that may be useful in some contexts but also pose insidious threats in and around our own homes. She has found that mothers living near hazardous waste sites have chemical contaminants in their breast milk. She has also played an important role in managing these hazards nationwide by training workers to think beyond individual problems and focus on the whole home.

In some ways, the home environment is getting safer. The last few decades, for example, have seen a drastic decline in the number of American children with high blood lead levels (BLLs). But Ettinger and her fellow epidemiologists say the task is by no means complete—not for lead, and not for a number of other indoor hazards.

And new threats surface all the time.



“Your home is your safe place.”

- Adrienne Ettinger

### Lead's legacy

Lead is a classic example of a double-edged sword. In paint, it produced a durable, washable finish; in gasoline, prior to the catalytic converter, it improved gas mileage and engine efficiency. It is a crucial ingredient of car batteries, makes an excellent radiation shield and is tremendously useful in building construction.

Yet it is also a notorious neurotoxin, one that does its damage slowly and all but invisibly. Even at low levels, lead exposure can cause learning disabilities or behavior problems that reduce a child's chances of educational success. And though lead is no longer used in paint or gasoline in the United States, untold tons remain in the environment.

Just how to reconcile these realities is a problem that has occupied Ettinger and other researchers for years. The Healthy Homes and Lead Poisoning Prevention Branch (HHLPPB) of the Centers for Disease Control and Prevention (CDC), where Ettinger worked in the mid-1990s, for example, convenes a federal advisory committee of

scientists, advocates and health department officials to discuss lead toxicity as well as other home-based threats. Members of this committee, who set national guidelines for pediatric blood level testing, recently lowered the limit of concern. Ettinger, meanwhile, oversaw the CDC working group that developed guidelines to identify and manage elevated BLLs in pregnant and lactating women.

While blood tests may reveal lead hotspots, practitioners have to strike a careful balance between eliminating lead from the home and mitigating the hazard it poses. Total lead removal is expensive, and the process, if not done properly, can disturb lead so that it may do more harm than good. In many cases, it's better to use such interim control strategies as covering painted surfaces and advising residents to control dust in their homes or flush pipes before drinking their water.

“We made a decision as a country in the early 1990s that we were going to make housing lead-safe, not lead-free,” says program head Mary Jean Brown, Sc.D., R.N., who



is the former chief of the HHLPPB. “That means that for the foreseeable future, we are going to live with this toxin in our midst.”

Statistics suggest that this relatively modest strategy has paid off. A late 1970s survey found that 88 percent of children between ages 1 and 5 had BLLs greater than 10 micrograms per deciliter (mcg/dL). In the late 2000s, less than 1 percent did. And the reduction has been the most pronounced in African-American and poor children, groups with historically higher BLLs – which raises issues of environmental justice. Children who have dodged the lead bullet stand a far better chance in life. Today, about half a million American children still have BLLs of 10 mcg/dL or higher – a large and tragic number, but a sign of progress nevertheless.

“With lead [abatement], you get an amazing return on your investment, and we know exactly what to do,” says Rebecca Morley, executive director of the National Center for Healthy Housing (NCHH), formerly the National Center for Lead-Safe Housing.

## Successes, challenges

And yet Ettinger cautions that it’s too soon to declare victory.

Although lead was banned from gasoline and paint in the 1970s, some 38 million units of housing still contain aging lead paint, while much of the soil in urban areas is contaminated by

A father repairs an interior doorframe while his son plays in an adjacent room. In older houses, activities that involve the preparation or renovation of painted surfaces need to be handled carefully. The paint might be lead-based, and appropriate precautions are needed to minimize the spread of paint chips and airborne particulates.

decades of lead emissions from the leaded-gasoline era.

Lead from both sources can be inhaled or ingested. When a person takes lead into the body, it accumulates in the tissues, mainly in bone, where it will remain for decades and can leach out during pregnancy and cross the placenta. In exposed fetuses, as well as in children who chew paint flakes or a lead-coated toy, lead can cause gradual and irreversible brain damage. Ettinger and colleagues have found that pregnancy and breastfeeding can increase the intergenerational risks for exposure to such environmental contaminants as lead and that those exposed in the womb may be at greatest risk during the first trimester.

Indeed, no BLL appears to be safe in children, so the CDC announced in 2012 that a BLL of 5 mcg/dL should trigger a clinical follow-up. Even levels as low as 2 or 3 mcg/dL raise the risk of poor academic performance and attention-deficit disorder.

Amid the new standards, however, the CDC’s lead-fighting resources have been slashed. The HHLPPB’s 2012 budget



Safeguarding people against potential health threats in their homes is an ongoing public health effort. While progress has been made in protecting people from lead exposure and other hazards, new chemicals—with their own serious consequences for health—continue to surface.

was cut to just 7 percent of its 2011 budget, forcing it to withdraw financial support for state and local lead-prevention programs. “Unfortunately, the message about our public health success in this area has been communicated as a ‘job well done,’ when in fact the job is far from being done,” says Morley.

To keep up with dwindling resources, tighter standards and a shift in public attention, public health programs are changing their approach. Although decades of screening children with blood tests have allowed officials to target problem housing, testing doesn’t offer much to the children themselves, because the benefits of therapies like chelation are modest at best. The goal now is to prevent childhood lead exposure entirely—primary prevention—which means a shift toward screening houses, not children, for lead contamination. The hope is to nip lead problems in the bud.

## A holistic approach

Even as scientists work to prevent lead poisoning, they’re stepping back to look at what else is wrong with our homes. Why stop with lead and pronounce a house “safe” if it also has fire-prone wiring or rampant allergens or excessive use of pesticides?

In the early 2000s, Ettinger, then a Johns Hopkins faculty member, began to work with the NCHH to develop guidelines for what constitutes healthy housing. “Certain toxic exposures, like lead and tobacco, had their own pre-

vention programs, while others, such as mold and pesticides, were emerging as concerns,” she recalls. “Nobody was really taking a holistic look at the home from a health perspective.”

Under the NCHH’s auspices and with CDC support, Ettinger and colleagues developed curricula in broad healthy-housing principles for public health, housing and energy efficiency professionals. Some 20,000 have since been trained across the country. Today’s HHLPPB is similarly holistic. Its goals include not only the elimination of high BLLs in children but also ensuring that a house’s location, design, construction, maintenance and renovation support the residents’ health.

That’s a huge undertaking. Radon gas alone kills 22,000 people a year from lung cancer—more than twice the number killed by drunk drivers. Carbon monoxide and secondhand smoke continue to foul indoor air. Many houses are permeated by asthma triggers like mold, pesticides and cockroach dander. Carpets emit toxic fumes, as do many substances in newly constructed homes—which was demonstrated by some of the post-Katrina FEMA trailers when they off-gassed formaldehyde. Children fall through unguarded high-rise windows and elderly people fall down stairwells when handrails are broken or missing.

Despite limited funds, the HHLPPB is working with the Department of Housing and Urban Development on secondhand smoke, allergens and ventilation and with the CDC’s Injury Center on home injuries. The branch maintains an advisory board and a national surveillance system, and it works with epidemiologists to respond to reports of lead in consumer products (in recent months, those have included pirate costumes and eye makeup). The HHLPPB also serves as a federal partner to the training center.

Committing to the big picture in environmental epidemiology may go beyond understanding individual hazards; what’s also needed are a cross-disciplinary approach and a search for unconventional solutions. For example, environmental health and perinatal epidemiology are often housed in distinct academic silos, yet many environmental toxins act on the fetus. The Yale Center for Perinatal, Pediatric and Environmental Epidemiology (CPPEE) combines these academic disciplines. Ettinger’s colleagues at CPPEE, including co-directors Michael B. Bracken, M.P.H. ’70, Ph.D. ’74, and Brian P. Leaderer, M.P.H. ’71, Ph.D. ’75, are studying the effects of household levels of nitrogen dioxide from gas stoves and such respiratory effects as asthma in children. That broad outlook drew Ettinger, an experienced perinatal researcher, to join the Yale faculty in 2010.

After years of studying fetal exposure to lead, arsenic and other hazardous substances, Ettinger has recently begun to look at solutions to indoor health hazards from a nutritional angle. The idea is that if engineering fixes are expensive and impractical, eating protective foods or dietary supplements may offer another way to reduce harm.

In pregnant women with high bone lead levels, for example, Ettinger has shown that calcium supplements may partially protect the fetus and nursing infant from lead exposure.

## Finding balance

Can we look forward to safer homes in the future?

Morley is optimistic, noting that people are getting savvier about their options and that improved transparency is allowing for more choices. “I think that consumers are on to industry,” she says. “It’s going to be in the industry’s best interest to adopt some of these practices for marketing differentiation and for liability protection.” Yet the NCHH’s attempts to speed changes are often frustrated. When the nonprofit proposes safety-related updates to building codes before the International Code Council, Morley says, it meets with opposition – from the National Association of Home Builders.

Indeed, we seem to take two steps forward and one step back with some hazards. Take energy efficiency: though post-1970s homes are more efficient thanks to tighter construction and more seamless insulation, sealing in heat and air conditioning comes at a cost – toxic substances in the air don’t vent as readily and indoor air quality suffers. Mere awareness and the availability of such tests as the one for radon aren’t sufficient to eliminate problems. Ettinger is also concerned about the potential dark side of useful things like Teflon-coated pans, such plasticizers as BPA and phthalates, indoor pesticides and myriad personal care products. And despite all we know about lead, it keeps cropping up where we shouldn’t expect to see it any longer. Constant vigilance is in order.

“Twenty years ago my thesis advisor was being interviewed about lead in lipstick, and now it’s in the news again,” Ettinger says. “There’s a lot that still needs to be done.”

Though it can be hard to abate known hazards, the bigger problem, according to Ettinger, is simply a lack of knowledge. There are hundreds of thousands of synthetic chemicals on the market, and the health effects of the vast majority are unknown. Decision making may be made harder by groups that advocate blanket avoidance of artificial substances, casting an alarmist light on innovation and subtracting nuance from policy discussions. Yet when we do find that a specific chemical causes harm, Ettinger said, manufacturers often react by changing one of its molecules to create a similar but unstudied substance.

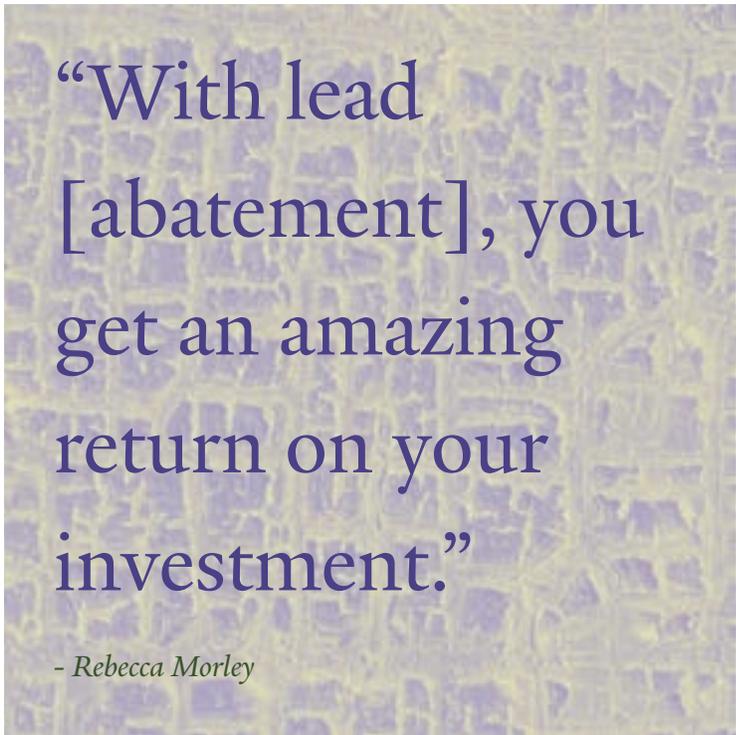
“We need well-conducted peer-reviewed research done by scientists in order to address these issues,” she says.

From a public health perspective, then, it’s important to neither overlook nor oversimplify indoor hazards. Case in point: the two-sided health effects of chlorine in drinking water, which bears some similarities to our relationship with lead. The substance kills harmful bacteria, preventing potentially deadly waterborne illnesses, yet the byproducts of chlorination that we breathe in during a hot shower or consume in drinking water, for example, can themselves be

harmful. There is, it seems, no escaping the big picture.

“It’s not a question of right or wrong,” she says. “It’s about weighing the risks and getting everything in balance.” YPH

*Jenny Blair, M.D. '04, is a freelance writer and editor in Texas.*



“With lead  
[abatement], you  
get an amazing  
return on your  
investment.”

*- Rebecca Morley*





## YSPH programs monitor and investigate breaking cases of foodborne illness throughout Connecticut.

By Theresa Sullivan Barger

After a Connecticut man in his mid-60s died from a foodborne infection, a team at the Yale School of Public Health specializing in such cases helped uncover the likely source: store-bought food tainted by *Listeria* – a bacterium that can move from the digestive tract to cause invasive infections of the bloodstream and central nervous system.

Further epidemiological investigation revealed that the strain of *Listeria* identified by lab tests for another senior citizen – one living in the Midwest – matched the Connecticut strain. The lab results were used to pinpoint the source – chicken salad that had been prepared in New York and sold in a Florida deli. YSPH staff interviewed the Connecticut man’s widow and determined that he had vacationed in Florida shortly before becoming ill.

The outbreak ended with the manufacturer recalling hundreds of pounds of fresh and frozen meat and poultry products. No further deaths were traced to the company’s products, and the manufacturer had its facility thoroughly sanitized. Subsequent testing found no further traces of *Listeria*.

### Fighting foodborne illnesses

The case of the contaminated chicken salad is only one of many instances of foodborne disease investigated by the school. Two programs at Yale – FoodNet and FoodCORE – work closely together and complement each other’s missions to monitor foodborne illnesses and identify and respond to outbreaks, respectively.

The Emerging Infections Program (EIP) at YSPH assists with both efforts in Connecticut. The Foodborne Diseases Active Surveillance Network, more commonly known as FoodNet, was established by the Centers for Disease Control and Prevention (CDC) in the mid-1990s; it conducts active population-based surveillance at 10 sites in the United States, including Connecticut. FoodNet tracks laboratory-confirmed infections, monitors illnesses caused



by select pathogens commonly transmitted through food and conducts surveys and epidemiological studies.

Meanwhile, the CDC's Foodborne Diseases Centers for Outbreak Response Enhancement, known as FoodCORE and established in Connecticut last year, works at seven sites across the United States to help detect, investigate and respond to outbreaks. The two programs' Connecticut sites collaborate with the Connecticut Department of Public Health and the School of Public Health, as well as with the CDC.

FoodNet provides a crucial line of defense by helping public health officials better understand the epidemiology of foodborne diseases caused by bacteria and parasites that can be transmitted when food is improperly handled, prepared or stored.

Despite stringent rules and enforcement efforts at various levels of government, the overall number of infections from tainted food remains fairly high; foodborne illnesses are a serious—and sometimes deadly—public health threat in Connecticut and beyond.

In 2012, there were 19,531 infections, 4,563 hospitalizations and 68 deaths associated with foodborne diseases and reported through the 10 FoodNet sites, according to the CDC's *Morbidity and Mortality Weekly Report*. And these are just the cases in which those who became sick saw their doctors and the doctors ordered the appropriate lab tests to

detect the various intestinal pathogens, says Sharon Hurd, M.P.H., the Connecticut FoodNet program coordinator at EIP. In Connecticut alone, 1,266 laboratory-confirmed cases of foodborne diseases were reported, including 289 hospitalizations and six deaths in the same year.

“Foodborne illness is an important public health threat in Connecticut and nationwide,” Hurd says. “It is important to continually monitor illness trends. Our programs help to provide more complete information on the burden of foodborne illness and the extent of outbreaks in our community.”

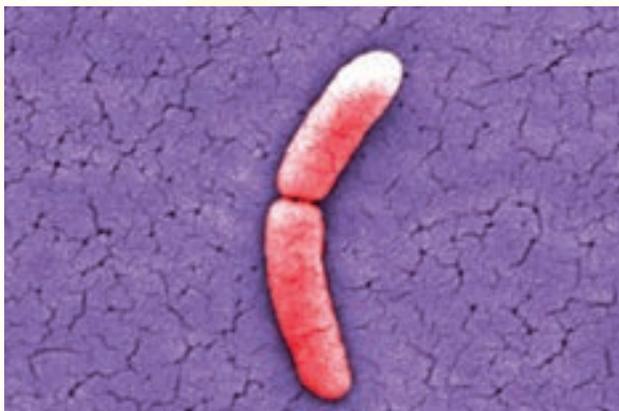
### How it works

Connecticut's FoodNet tracks every laboratory-confirmed case caused by seven bacterial pathogens—*Salmonella*; *Shigella*; *Campylobacter*; *Escherichia coli* (*E. coli*) O157 and other non-O157 Shiga toxin-producing *E. coli* (STEC); *Listeria monocytogenes*; *Yersinia enterocolitica*; and *Vibrio*—and two parasites, *Cryptosporidium* and *Cyclospora*.

These cases are investigated and documented with the help of students from Yale College and the School of Public Health. The students review test results from every lab in the state for the pathogens tracked by the CDC, and their findings contribute to national statistics. Collectively, Connecticut and the nine other states with FoodNet sites monitor some 600 laboratories nationwide, covering about 15 percent of the U.S. population.

“FoodNet is responsible for over 100 variables that go to CDC and contribute to the completeness and accuracy of the data,” Hurd says. “We're responsible for making sure that all cases of foodborne illness identified in the laboratories are reported and that nothing is missed. Without FoodNet, the CDC would just get basic surveillance information.” FoodNet active surveillance records information that captures demographics and onset of illness and symptoms, as well as the percentage of patients that were hospitalized and the percentage that died, she notes.

Public health officials know that there are far more cases of foodborne illnesses than those officially identified, so it is essential to learn as much as possible from each reported case, says Mary E. Patrick, M.P.H., the CDC's FoodNet project coordinator. Data collection is essential to creating a big picture of foodborne disease over time for use by public health officials.



A *Salmonella* bacterium in the process of cell division that will result in the formation of two separate organisms. Humans exposed to *Salmonella* can experience diarrhea, fever, abdominal cramps and illness that persist for seven days.



“We’re responsible for making sure that all cases of foodborne illness identified in the laboratories are reported and that nothing is missed. Without FoodNet, the CDC would just get basic surveillance information.” –Sharon Hurd

Cases of foodborne illness, meanwhile, are investigated and documented with the help of five YSPH students working with FoodCORE. As a matter of routine as well as when an outbreak occurs, the local health department, the state health department and Yale epidemiologists and students work together to interview people with confirmed cases of foodborne illness.

Staff members gather data by calling the sick person directly or, in the case of a child or deceased patient, calling a close relative. Furthermore, they collect demographic, clinical, risk factor and other information, posing more than a dozen questions to help spot potential patterns and, critically, to prevent the illnesses from spreading. Local health officials can then use the information to take necessary steps.

Through the staff members’ interviews, for example, FoodCORE determines whether the person works in food preparation, direct patient care or a day care center. This information allows health officials to alert others who may have been exposed.

Sometimes when investigating an outbreak from a single event such as a party, the staff member discovers that another food was served that wasn’t on the menu, says Samantha Greissman, a Yale senior who is also in her first year at the Yale School of Public Health and a FoodNet and FoodCORE staff member. The information is then passed along to the Connecticut Department of Public Health outbreak coordinator, who updates the list.

The CDC, meanwhile, tracks metrics that are different from the data collected by municipal health departments, whose primary goal is to address the local public health threat. If the local health department interviews the patient

and doesn’t ask all the questions that the CDC needs, FoodCORE staff attempt to fill in the gaps, Greissman says.

“We just had two cases of *E. coli* where the local health department interviewed both patients and didn’t ask all the questions that we ask when we interview patients,” she says. “Basically, we were missing data that we needed to fill in.”

If patients do not answer their phones, FoodCORE has to find another way to collect the information. The search may require calling the hospital, doctor or lab to gather demographic data and such details as whether the patient traveled out of state or outside the United States.

Since FoodNet’s inception, the highly detailed data that the program collects have helped to form a more accurate picture of how people get sick from foodborne illness. This higher level of accuracy has led to increased regulation and oversight at the source as well as improved prevention information.

Data collection has also helped public health officials identify potential risks in order to educate the public. For example, children under 3 years old who ride in the baskets of grocery store shopping carts are at increased risk of contracting *Salmonella* or *Campylobacter* from packages containing poultry or raw meat; this finding was reported in a 2010 study published by Patrick, Hurd and others in the *Journal of Food Protection* (children riding in the cart’s seat were less likely to be exposed). The report led to a public information campaign to encourage parents to use sanitizing wipes before placing children in shopping carts; to place children in the cart’s seat rather than the basket; and to place raw meat and poultry in plastic bags and away from children.



Thoroughly cooking meat, fish, poultry and eggs kills the pathogens that cause foodborne illness. Additional steps such as washing hands when handling food and using separate cutting boards and knives for meat and produce can reduce the chances of contracting a foodborne illness.

## Five most common foodborne infections

Every year, about 48 million people, roughly one in six in the United States, get sick from ingesting or coming into contact with contaminated food. Here are the five most common pathogens contributing to foodborne illnesses.

*Source: Centers for Disease Control and Prevention*

### Campylobacter

*Incidence:* An estimated 1.3 million cases annually.

*Causes:* Consumption of uncooked poultry, raw milk or water from surface water and streams contaminated with bacteria.

*Symptoms:* Diarrhea, cramping, abdominal pain and fever within two to five days after exposure.

### Clostridium perfringens

*Incidence:* Nearly 1 million cases annually.

*Causes:* Consumption of food contaminated with bacteria that grow when food is kept at temperatures between 54 and 140 degrees Fahrenheit.

*Symptoms:* Diarrhea and abdominal cramps within six to 24 hours after exposure.

### Norovirus

*Incidence:* About 21 million cases annually.

*Causes:* Contact with an infected person or with contaminated food, water or tainted surfaces.

*Symptoms:* Stomach pain, nausea, diarrhea and vomiting.

### Salmonella

*Incidence:* About 40,000 cases annually.

*Causes:* Consumption of undercooked poultry, meat, eggs or raw milk. Exposure to live poultry and small turtles.

*Symptoms:* Diarrhea, fever, abdominal cramps and illness that persist for seven days.

### Staphylococcus aureus

*Incidence:* An estimated 241,000 cases annually.

*Causes:* Consumption of food contaminated with bacteria passed from food workers. Consumption of contaminated milk and cheese. Highest-risk foods are those made by hand that require no cooking—sliced meat, puddings, pastries and sandwiches.

*Symptoms:* Nausea, vomiting, stomach cramps and diarrhea that usually develop within one to six hours after exposure.



## Student sleuths

While no one wants to see people get sick during an outbreak, investigating the source under intense deadline pressure does make for exciting work, says Greissman, who plans to pursue a medical degree after her M.P.H., with the goal of becoming an infectious disease specialist.

“It’s in real time. It’s a little bit of a high-stress, busy situation,” she says. When there’s a *Salmonella* outbreak at a barbecue, for example, staff will be given a list of those in attendance. “You call one person and they say, ‘My cousin was sick.’ And they tell you the name and that person wasn’t on the list. This is another clue.” The students don’t take the lead in data analysis, but they know that the fruits of their research are crucial in identifying the source of the illness and, ultimately, in protecting the public.

The addition of the Yale FoodCORE student team made a measurable difference in interviewing people with a foodborne illness, says Quyen Phan, an epidemiologist with the Connecticut Department of Public Health. In the first year of FoodCORE, more than 80 percent of people with reported cases of *Salmonella* were interviewed, compared with about 50 percent in previous years.

“Rapid and thorough interviews enhance [the department of] public health’s ability to quickly detect and investigate potential outbreaks,” Phan says. “The faster we are able to identify and investigate outbreaks, the greater the chances of preventing further illness.”

While outbreaks from peanut butter, spinach or restaurant food grab the headlines, most foodborne illnesses are sporadic and not part of clusters, Hurd says. In many cases the exact source of the illness is never determined.

“It is difficult to find or pinpoint the cause of foodborne illness because the majority of foodborne illnesses occur as individual or sporadic cases and are not associated with an outbreak,” she says. “And outbreaks that were once contained locally are now seen on a national or even international scale.”

## Preventing foodborne illnesses

There are a few simple steps people can take to prevent foodborne illness. Thoroughly cooking meat, fish, poultry and eggs kills the pathogens that cause foodborne illness. Food workers who wash their hands, wear gloves and don’t work when sick are less likely to contaminate food. Also,

cooks should use separate cutting boards and knives for meat and produce.

“Food can be contaminated at the source or in the slaughterhouse,” Hurd says. “You can’t avoid everything, but what you can do on a personal level is watch what you do.” For example, she’s pleased to see that a growing number of restaurants will no longer serve undercooked or raw meat and runny eggs. If they do serve uncooked or undercooked food, they will often indicate on the menu that eating it puts people at risk of foodborne illness.

Since years of data collection show that children under age 5, pregnant women, people over 65 years old and those with compromised immune systems are at greatest risk, Hurd suggests that people belonging to these groups be especially careful.

Looking forward, farmers, the food and food service industries, regulatory agencies, consumers and public health officials will all have important roles in addressing and reducing the incidence of foodborne illness. But obstacles to slowing and stopping the contamination of food remain.

“There is still room for improvement,” Hurd says. “Regulatory controls, inspections and adherence to safety practices along the food chain can make a difference in contamination, but protecting the nation’s food supply requires resources. We need to strengthen and expand our national food safety efforts.”

Data collected by FoodNet, meanwhile, inform others who focus on the education and prevention side of public health, Hurd says. Analysis has increased public health officials’ understanding of foodborne illnesses. This heightened awareness is reflected in the amount of information now available on their websites.

Such diligent data collection also helps the CDC stay abreast of threats from emerging bacteria or bacteria in the process of mutation. “One of the activities of the Emerging Infections Program is to maintain the flexibility for emergency response to address new problems as they arise,” Hurd says. “Our FoodNet data, through both surveillance and studies, should continue to inform those programs that monitor and support food safety.” [YPH](#)

*Theresa Sullivan Barger is a freelance writer in Connecticut.*

# Backyard Science

Researchers are looking at whether bait boxes can break the transmission cycle of Lyme and other tick-borne diseases.



© Princeton University Press

The boxes are small, inconspicuous and easy to use. And they might be an effective way to reduce the incidence of Lyme disease and other tick-borne illnesses.

As part of a study currently under way at the Connecticut Emerging Infections Program (EIP) at YSPH, bait boxes have been placed in the yards of approximately 625 homes in 18 towns in western Connecticut to determine their efficacy against Lyme and other tick diseases.

“We know that bait boxes reduce the number of ticks and offer further protection by disrupting the cycle of transmission of the Lyme disease bacterium between ticks and small mammals. Ultimately, however, we want to assess whether bait boxes can reduce the incidence of Lyme and other tick-borne diseases in humans,” says Sara Niesobecki, who is coordinating the study for EIP.

The approach is fairly simple. A bait box entices a white-footed mouse or other small mammal to enter with the prospect of food. As the animal moves through the box, a brush applies trace amounts of an acaricide known as fipronil to its fur.

The mouse emerges from the box, recently fed, and continues on its way unharmed. In a short amount of time, the tiny nymphal ticks attached to the mouse start to die and fall off. Mice are the main source of the pathogens that cause Lyme disease and other illnesses, and ticks are the vectors that transmit them to humans.

The bait box approach has a number of advantages over traditional spraying. Bait boxes can be used through an entire season, are less affected by temperature and precipitation and provide coverage to an entire yard (not just sprayed areas). The amount of pesticide used with the bait box approach is also considerably less than that used in an areawide application of acaricide.

While the boxes are known to be effective at killing ticks, there is no scientific evidence yet that they are also an effective tool in preventing human disease. Researchers are currently in the first year of a three-year study and hope that by 2015 they will be able to show whether or not the bait boxes offer homeowners an extra level of protection against diseases that for many diminish the enjoyment of summer and the outdoors.

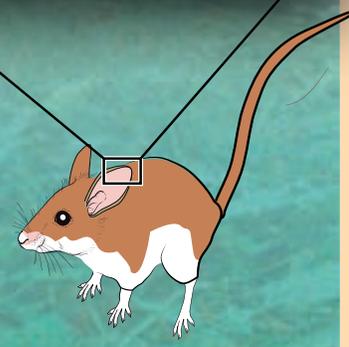
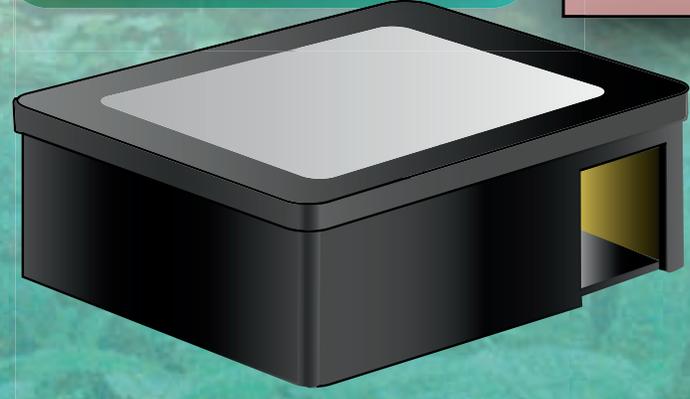
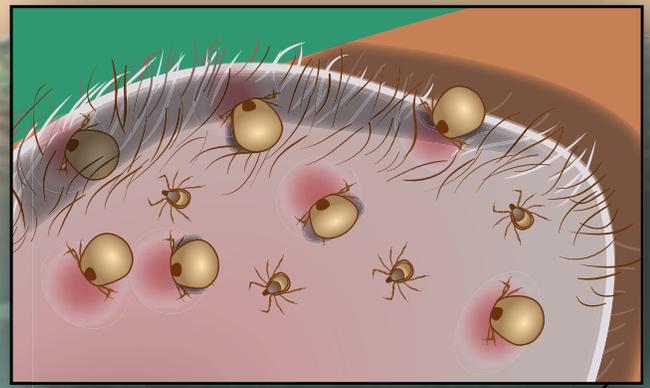
“People are concerned about Lyme disease but public health officials have little to offer them. There are many common-sense recommendations for preventing tick-borne diseases but little data to show whether these measures work. Our study is collecting the data to show whether one of these measures – bait boxes – reduces the number of tick-borne infections in people living on properties where they are used,” says James I. Meek, EIP’s associate director. YPH

*Michael Greenwood*



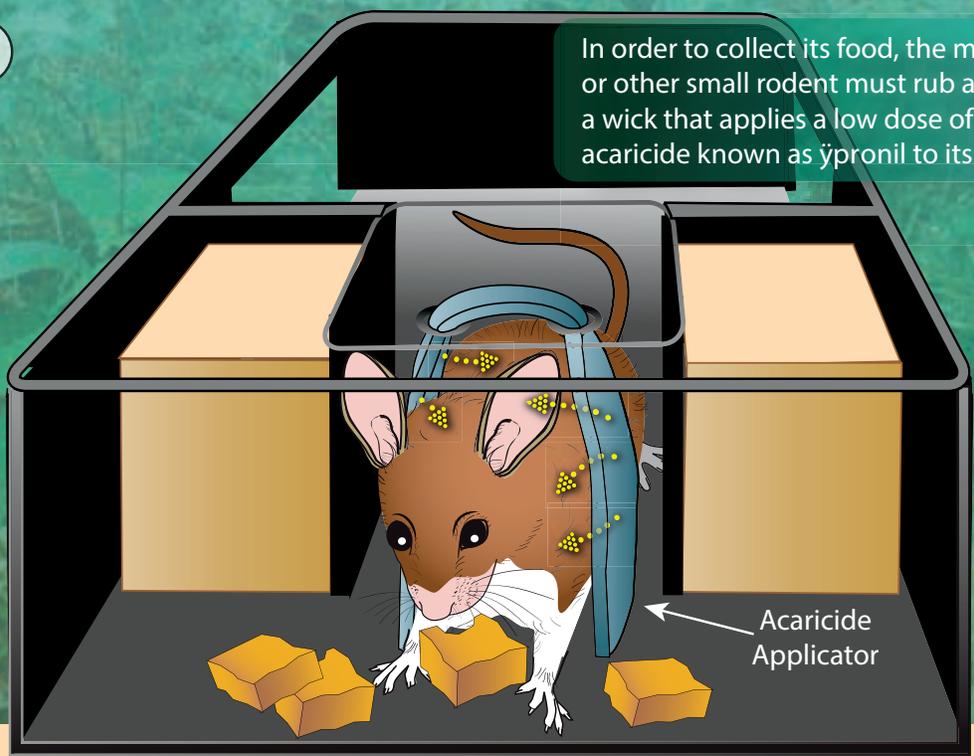
# Anatomy of a bait box

1 Bait boxes are placed around the perimeter of a home to attract the white-footed mouse that carries the bacterium responsible for Lyme disease and other illnesses. Ticks that feed on the mice become infected with the bacterium and transmit it to humans.

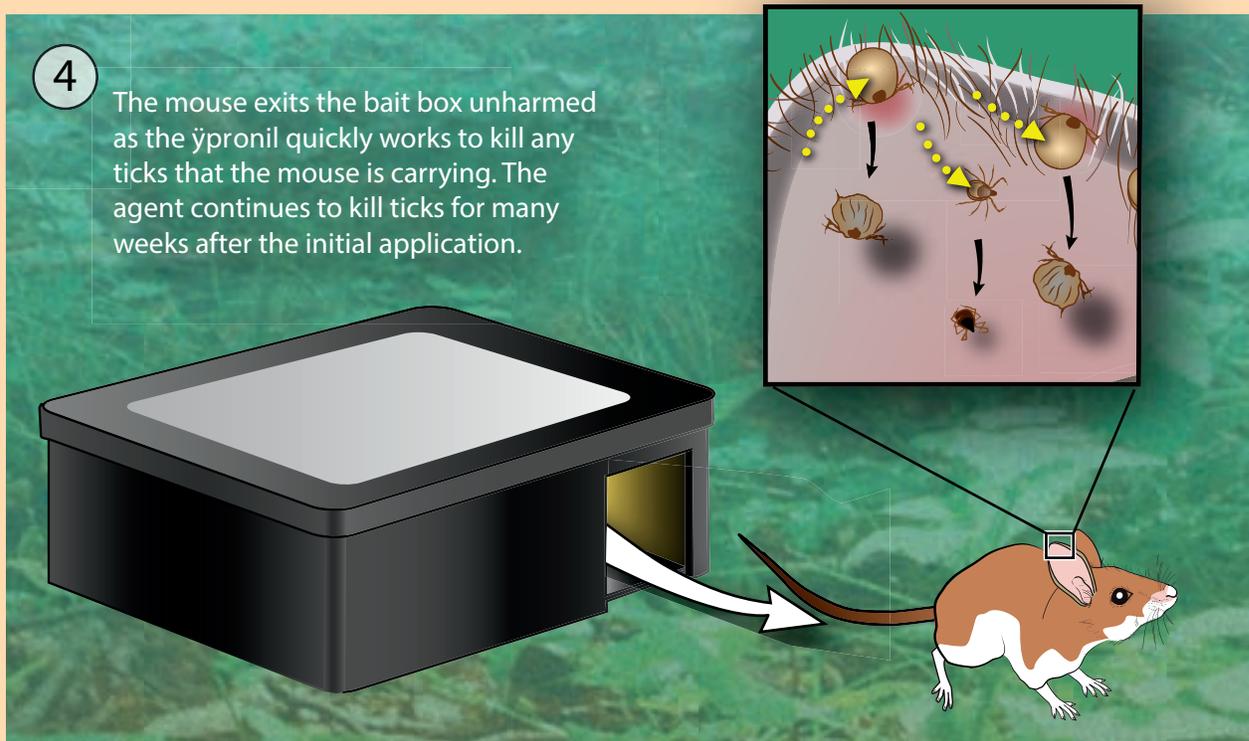
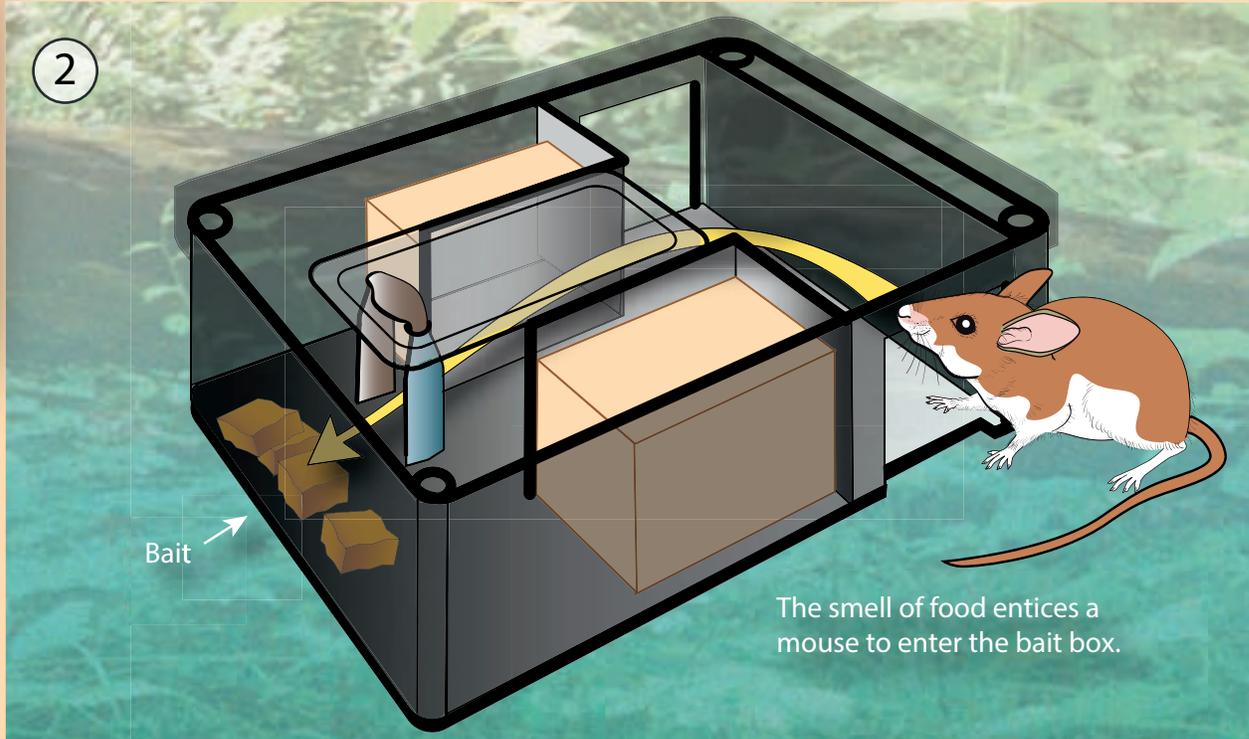


3

In order to collect its food, the mouse or other small rodent must rub against a wick that applies a low dose of an acaricide known as ypronil to its fur.



“We know that bait boxes reduce the number of ticks and offer further protection by disrupting the cycle of transmission of the Lyme disease bacterium between ticks and small mammals. Ultimately, however, we want to assess whether bait boxes can reduce the incidence of Lyme and other tick-borne diseases in humans.” – Sara Niesobecki



## Q&A

### Health threats in the home



Gary Ginsberg

Gary L. Ginsberg, Ph.D., a public health toxicologist in Connecticut and a lecturer at the Yale School of Public Health, sees progress in the amount of toxins that have been removed from people's daily lives. But there is a new wave of chemicals to be concerned about, and people continue to be exposed to hazardous substances in and around their homes. Ginsberg has co-authored a book geared toward the general public, *What's Toxic, What's Not* and also has a website, *whatstoxic.com*, to answer questions about chemicals in consumer products and the homes we all live in. He regularly appears on radio programs across the country and at community events around Connecticut and the metro New York area. He has appeared on the Dr. Oz television show numerous times, and his blogs can be found at *The Huffington Post* and the Dr. Oz website.

#### **In terms of the safety of household products and environmental contaminants, are things better today than they were, say, 25 years ago?**

**GG:** Many people have the impression that chemical exposures are always increasing as industry keeps making new materials and products. However, this is not so. Many of the worst chemicals from years past have been phased out, including lead in paint and gasoline; PCBs from electrical transformers and caulk; mercury from thermometers; nitrosamines from baby pacifiers; arsenic from outdoor (pressure-treated) wood; asbestos from home insulation; DDT and other persistent pesticides. Eliminating these chemicals is a huge advance and, yes, homes are safer today with respect to these issues. However, there is a long way to go, as there are many "designer" chemicals that have been introduced in recent years to make our fabrics stain-resistant or fire-retardant, to make new kinds of plastic or to make our products free from bacteria. These chemicals have raised a new series of health concerns.

#### **What do you see as some of the bigger public health victories against toxic substances in recent years?**

**GG:** There has been an increasing recognition that endocrine disruptors are present in plastic and that they migrate out of packaging, flooring, shower curtains and baby bottles. The banning of bisphenol A (BPA) and certain phthalates from children's products has been a positive

response to the emerging issue of endocrine disruption. Formaldehyde is a toxic chemical that outgasses from inexpensive furniture and cabinets. Recent legislation that started in California and has now become the national law puts a safety limit on how much formaldehyde can be in our wood products. These examples show that governments can respond to toxics in the marketplace.

#### **What about mold in the household? How big a health threat is it?**

**GG:** Mold is an allergy concern. Some people are very sensitive to start with, and others become sensitized by living with mold for a period of time. It's not as toxic as some have made it out to be, but it is still unhealthy to breathe high levels of mold spores. Therefore, homeowners should aggressively tackle moisture and mold issues in the home.

#### **What do you consider to be some of the major health threats that people face within their living environments?**

**GG:** There are "skull and crossbones" products in every home that put thousands of people (especially children) in the hospital every year. These include household pesticides, powerful cleaning products, drain cleaners, pool chemicals, anti-freeze, paint thinners and even something as simple as moth balls. They need to be kept far away from children and pets; the risks can also be high for adults who are not careful. The best approach is to bring home as few of these products as possible and to use them with extreme caution.

#### **What are the minor threats?**

**GG:** Less severe but still a health risk are certain products used around the home and in the workshop. Regarding household products, avoid aerosol spray cans, as the fine mist typically carries hydrocarbons deep into the lungs. This can include furniture polish, cleaners, disinfectants and air fresheners. Instead, use versions of these products that come from a pump bottle or that can be applied with a sponge or cloth. Air fresheners are not needed in most cases and don't really freshen the air. Regarding the workshop, all paints, varnishes, sealants and glues put chemical solvents into your breathing zone when they are applied and as they cure. Make sure you follow directions, use them with adequate ventilation and keep them away from children.

“I think people look at function and price before they think about safety.”

—Gary Ginsberg

**You’ve likened some household cleaners to the “atom bomb.” What do you mean?**

**GG:** Bleach and ammonia on their own are highly irritating and toxic. When they are mixed they become explosive. Bleach and drain cleaners will also react this way. It’s best to not keep bleach around the house, to avoid exposures and accidents.

**How safe is the fish that we eat?**

**GG:** Most fish can be eaten safely one to two times per week, even during pregnancy. The protein and omega-3 fatty acids in fish are important for brain development. However, certain fish are high in mercury and should be avoided, especially during pregnancy. Swordfish is an example. The Connecticut Department of Public Health website has a fact sheet that explains healthy eating of local and store-bought fish.

**Are laws in the United States too lax when it comes to protecting people from toxins? How do we compare, say, with the European Union?**

**GG:** The review of new chemicals by the U.S. Environmental Protection Agency is reasonably stringent. The big concern has been with the backlog of grandfathered chemicals that have been in commerce for decades but not really tested. The European Union has decided to put the burden of proof to document safety on the manufacturers; while it will take years for them to catch up to all the chemicals in all the products, when they are done they will have a much better idea which products harbor the bad actors.

**Is BPA in plastic bottles, including baby bottles, a health threat that people should be concerned with?**

**GG:** Not anymore, since BPA has been phased out of baby bottles. The biggest exposure to this endocrine disruptor is probably in our cash register receipts—the thermal printing process involves BPA—better to just say “no” when they try to hand you the receipt.

**What products or substances do you go out of your way to avoid?**

**GG:** BPA in cash register receipts, BPA in canned food, microwaving in plastic, aerosol spray cans, household pesticides, air freshener, products scented with fragrance (contains phthalates), bleach, ammonia, bottled water (who knows how long chemicals from the plastic have been leaching).

**Supermarkets today have thousands of food and household products available to consumers. Do people choose wisely?**

**GG:** I think people look at function and price before they think about safety. They want to believe there is a governmental gatekeeper that safeguards the marketplace from carcinogens, teratogens (chemicals that cause birth defects), pesticides and hormones. But this has been a problem. Some stores pride themselves on having a more conscious line of products, notably the “natural food” stores. They have made a major expansion into cosmetics and cleaning agents in recent years because there are many toxics issues with the more commercial brands. Even though these outlets have higher prices, they capture a large market share. Obviously there are many people looking for this type of quality and safety.

**Are organics worth the extra money?**

**GG:** Yes. The wide variety of pesticides allowed on fruit and vegetables and the limited testing that goes into documenting residue levels are a pretty good incentive. Other reasons to go organic are to support a more sustainable form of agriculture and because organic produce is more likely to be grown domestically. But if you are going to bother getting pesticides out of your diet, you should also focus on your home. For most people, they get more pesticide exposure from lawn, garden and indoor pesticides than from their diet. YPH

*Michael Greenwood*

Students

# Health practice

More than 100 YSPH students spent their summer break working on complex health problems around the world as part of the internship requirement for their M.P.H. The internship provides students with a unique opportunity to practice what they have learned in the classroom and to experience the challenges and rewards of building better health.



**Siddartha Bhandary | Florida, United States**

Studying mosquitoes means going into their environment, which for Bhandary was the Everglades National Park in Florida. His summer project focused on determining the distribution, abundance and species composition of mosquitoes and mosquito-borne viruses occurring in the vast swampland. The assessment is needed in order to have a thorough understanding of virus-vector ecological interactions. It will also be useful for the implementation of an effective control program for arboviruses and the generation of future eco-epidemiology studies of disease transmission in this community.

Courtesy of Siddartha Bhandary

## Annie Tsay | Salvador, Brazil

Originally built in 1853, Hospital Couto Maia is the state infectious disease hospital in the city of Salvador. The Brazilian Ministry of Health and the Yale School of Public Health conduct active surveillance at the hospital on infectious diseases, such as leptospirosis, associated with urban slums. Tsay worked with researchers on epidemiological studies as well as immunological investigations to better understand disease transmission, prevalence and factors affecting susceptibility.



## Students

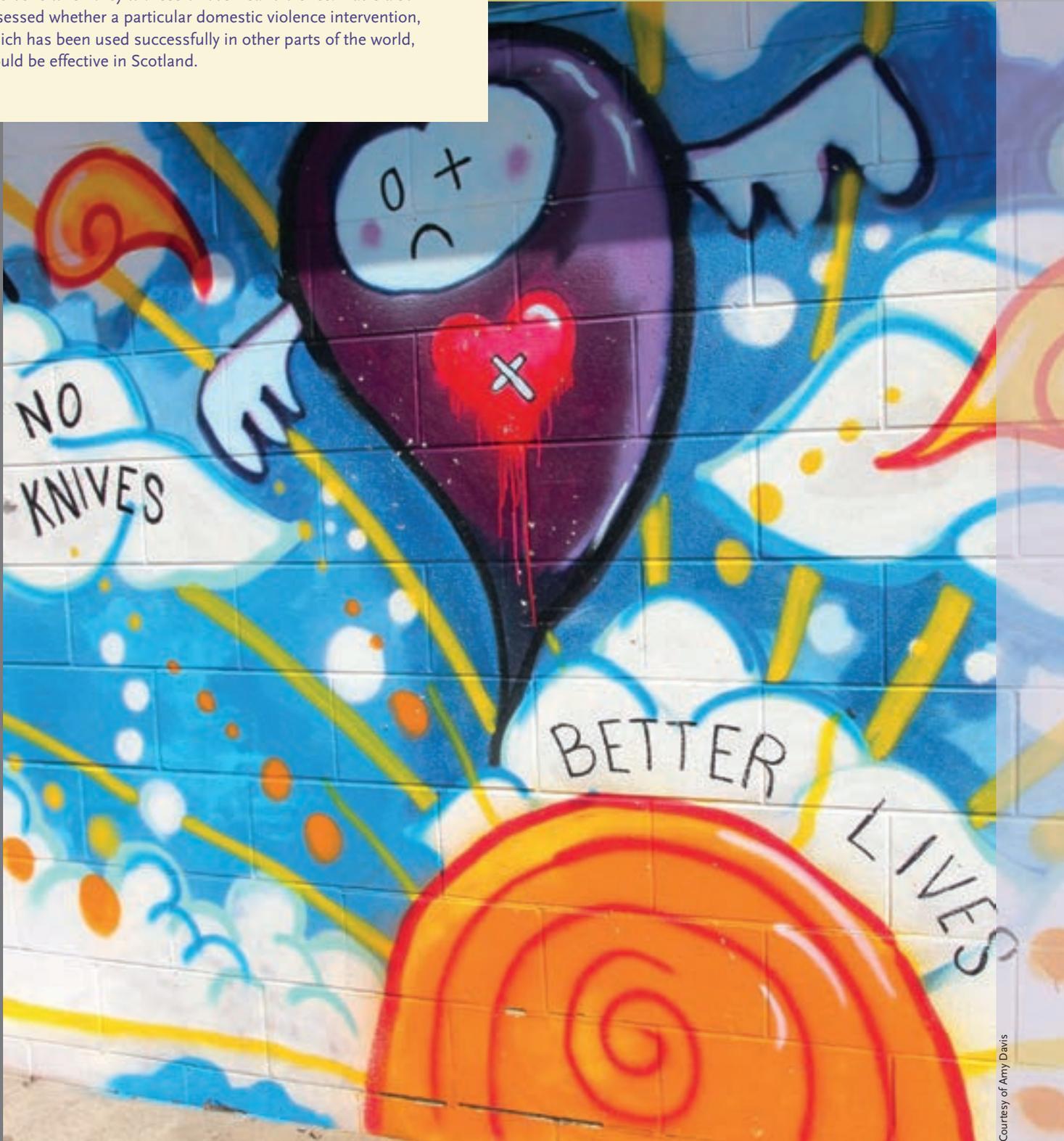


### Alexandra Adams | Mumbai, India

In conjunction with the *Story of a Girl Project*, Adams worked with the agency Social Activities Integration and visited different brothels in Mumbai, India, each week to gather blood tests, distribute condoms and basic medications and educate sex workers about HIV and safe sex. In each shift, at least 40 women would visit the health van, and several shared their personal stories for the project's upcoming HIV advocacy campaign. Here, outside of the brothels in Worli and at one of the outreach van's regular stops, a sex worker (in blue) takes advantage of the agency's free services.

Amy Davis | Glasgow, Scotland

A “No knives, better lives” mural on the side of the Hawkhill Community Centre was the site of a focus group conducted by Davis and colleagues. She examined whether and under what circumstances people who live in Scotland would be willing to intervene when they witness or overhear violence. Davis also assessed whether a particular domestic violence intervention, which has been used successfully in other parts of the world, would be effective in Scotland.



## Alumni Spotlight

# The end of an era

**A pillar of New Haven's health care system retires after 40 years at the helm of the Fair Haven Community Health Center.**

**By Lindsay Whalen**

Outside Branford's historic shoreline Owenego Inn, the crowd gathers on an early June evening. Clear skies and the setting sun offer a postcard-perfect view of Long Island Sound, and a trio of youthful women in colorful cocktail dresses poses for a picture along the edge of the outdoor patio. A group of older women chats nearby and other guests spill onto the freshly mowed lawn and wander down to the beach below. Their laughter echoes over the water.

At the Inn's entrance, a circle forms around an unassuming woman, willowy at 67 years old and dressed in flowing and vibrant layers that recall a long-haired youth. She is surrounded, but she smiles and takes time to hug and converse with each new guest.

The woman everyone has come to celebrate this evening is Katrina Clark, M.P.H. '71. The executive director of Fair Haven Community Health Center (FHCHC) for 40 years, Clark retired at month's end, a tenure that saw the clinic grow from a volunteer-staffed initiative into a critical part of the city's health care network, with an annual budget of \$12 million, some 65,000 patient visits a year and a reputation that extends far beyond Fair Haven.

### A calling

For Clark, service has been a lifelong calling first heeded in 1963. "I really was one of those children of the sixties and was a freshman in college [Cornell University] when Kennedy was assassinated," she says. "I made a commitment then that I would do something that he had asked us to do."

For Clark, that *something* meant joining the Peace Corps, a decision that connected her to a family legacy of good works. Her father, Lincoln Clark, a professor of economics, was involved in relief efforts for postwar Europe and was one of the founding directors of Cooperative for Assistance and Relief Everywhere, more commonly known as CARE.

Her postgraduation assignment took her to Colombia in 1967. She lived with a family and immersed herself in



Spanish and her work, helping to bring potable water to the small village in the heart of a river valley. In her second year, Clark relocated to Colombia's mountainous coffee-growing region, where she worked with a local nunnery to feed orphaned children.

Meanwhile, back home, society was changing. In April 1968, Clark says, "I opened up the paper, and there was a picture of the African-American students walking out of the student union at Cornell, with the bandoliers and the rifles." A local priest in Colombia owned the only television for miles, and Clark recalls watching coverage of the assassinations of Martin Luther King Jr. and Robert Kennedy in horror and disbelief. The radical shifts of the era became even more apparent when she returned to the states in 1969 to begin studying at Yale.

Clark had gone to Colombia without a clear sense of where her Peace Corps work would lead her. Her experiences there had exposed her to the injustice of health care inequality and solidified a commitment to work for change, but it wasn't until she stumbled upon a Yale M.P.H. fellowship targeting Peace Corps volunteers that a path in public health started to become clear.

The culture shock that Clark experienced in Colombia was nothing compared to what awaited her in New Haven. By the spring of 1970, the campus and the city were reeling. A crowd of more than 15,000 gathered on the Green on May Day to protest the trial of Bobby Seale, a member of the Black Panther Party. Clark gathered with fellow M.P.H. students and others from the medical and nursing schools to set up an on-site clinic for demonstrators. The skills she developed turned out to be essential. "We learned about



Jordan Ermont

logistics — how do you find cots, how do you organize a whole medical presence,” she says. Clark had started at Yale believing she would devote her career to foreign service, but New Haven opened her eyes to a profound need at home.

The social and health injustices that Clark witnessed were felt broadly, and local responses were under way. The Hill Health Center, the first community health center in Connecticut, opened in 1968, and in the then predominantly Puerto Rican and Italian-American neighborhood of Fair Haven, plans for a new clinic were forming. In August 1971, as an initiative of a local community advocacy group, the Alliance for Latin American Progress, the clinic that would become Fair Haven Community Health Center opened in what is now the Christopher Columbus Family Academy. The founding mission — to provide quality care to neighborhood residents, regardless of their ability to pay — remains FHCHC’s guiding principle.

Operating two evenings a week, with an all-volunteer staff and a budget of \$5,000 from the Community Foundation for Greater New Haven, the clinic treated 500 walk-in patients in its first year. The need for health care, however, was overwhelming, and the community-based board began searching for an executive director to steer the clinic’s expansion.

Clark had since graduated from the School of Public Health and was at a low point. She had recently lost her mother and was uninspired by a grant-writing position at Yale. The clinic seemed like an ideal way to give back and to utilize her Spanish skills. The board hired someone else, but Clark’s disappointment did not last long: three months later, the clinic contacted her to say that the first director

*Above:* Fair Haven Community Health Center in New Haven today has some 65,000 patient visits a year and has become a vital part of the city’s health care network. It was directed for nearly 40 years by Katrina Clark, who retired this summer.

*Top:* Katrina Clark became executive director of Fair Haven Community Health Center shortly after her graduation from the Yale School of Public Health in 1971. The dates of these two photos are unknown.

hadn’t been the right fit. In June of 1973, and just 27 years old, Clark came aboard.

She would grow up with the clinic, and her unwavering commitment, spanning four decades, has changed Fair Haven for the better, notes U.S. Rep. Rosa DeLauro, D-3rd District.

“The Fair Haven Community Health Center has grown into one of our community’s most respected nonprofit primary health care organizations,” DeLauro says. “Its success and the difference it continues to make in the lives of those it serves are Katrina’s legacy. She has left an indelible mark on our community.”

## The early days

Clark secured the funding that enabled the clinic’s growth; the grant-writing skills she had developed at Yale proved their worth. The clinic’s first federal funding was a family planning grant. “That allowed us to hire a midwife one evening a week,” Clark recalls. In this way, Clark laid the foundation for what would become FHCHC’s model midwifery practice. Her next step was to build a strategic alliance with

## Alumni Spotlight



Yale's School of Nursing: FHCHC would provide midwife student training and would receive much-needed volunteer assistance in return.

The student nurses' arrival coincided with FHCHC's move into its Grand Avenue home. In 1976, eager to find a permanent site, FHCHC purchased a stately Victorian home on Fair Haven's main thoroughfare. Once a private residence, the building was operating as a funeral home at the time of purchase; it is now part of the three-building unit that FHCHC currently calls home. FHCHC immediately established a presence. "The first task of the



With family members and U.S. Rep. Rosa DeLauro (right) at her retirement party in June, Katrina Clark (second from left) stepped down as executive director of the Fair Haven Community Health Center after 40 years.

midwifery students was to provide posters, which they put around in storefronts," Clark remembers. "Little by little the practice grew." By 1978, the clinic had tripled its hours from 16 to 50 a week and had opened a satellite clinic at the Bella Vista elderly housing complex in Fair Haven Heights. With programs targeted both to beginning- and end-of-life care, FHCHC was able to offer something Fair Haven lacked: comprehensive primary health care.

Assisted by a core staff to help realize FHCHC's vision, Clark persevered, over the next two decades, to build the clinic's program. Fundamental to her continued understanding of the clinic and the community were her Tuesday evening shifts at the clinic's busy reception desk. Working the front desk allowed Clark to keep up her Spanish skills, but more importantly it provided firsthand knowledge

of the challenges. "You need to be literally on the floor to know what's going on," Clark observes.

Clark's attention to the community and its changing needs guided FHCHC's development. In 1982, FHCHC established the state's first school-based health center, The Body Shop, at Wilbur Cross High School, in collaboration with the New Haven Board of Education and the Yale Adolescent Medicine department. The program has since expanded to four more area schools.

Epidemiological shifts also impacted FHCHC's programming. The 1980s saw the onset of the AIDS crisis; Ryan White CARE Act funding allowed FHCHC to respond with a broad range of preventative and clinical services. In recent years, as diabetes rates have soared, FHCHC has made nutritional and physical education a priority, partnering with Chabaso Bakery and others to create the New Haven Farms project, an urban farming initiative that brings community members into the garden and provides fresh produce.

And as the Fair Haven patient population became more solidly Latino, with Spanish-speaking-only Central and South American immigrants now the dominant new group, FHCHC has responded with more on-site translators and Spanish-speaking staff. Throughout, FHCHC has remained committed to affordable, accessible care. Staff is available to help all qualifying patients obtain insurance, and patients who do not qualify receive care on a sliding fee scale. The level of care provided, meanwhile, is priceless for the clinic's patients.

### A family environment

FHCHC staffer Erica Perez has been a clinic patient for 10 years and says it's the "family environment" that sets the clinic apart. Of the providers, Perez says, "They are attentive to their patients. They're available, and they really care."

The clinic is almost 50 percent grant-funded, meaning that Clark needed to bring together project-specific funding from disparate sources to create a comprehensive health care program. It's a challenge that Clark sees as her life's work.

"If anything has held me here for so long, it's wanting to achieve that dream of providing true primary care," she says. And for Clark and her staff, care has always been broadly defined: "Community health centers were created to deal with the larger issues in people's lives, not just with

# “She has left an indelible mark on our community.”

—U.S. Rep. Rosa DeLauro

the prescription. We look at the social factors that really impact people’s ability to care for themselves. We understand that if a choice is between eating, or heat, or getting a medication, you may well skip the medication.”

Clark’s broad, holistic perspective extends beyond the patients to the employees and is essential to FHCHC’s culture. Midwifery Department Chair Kate Mitcheom first joined the clinic in 1981 as a recent graduate of the Yale School of Nursing and remembers the family spirit that welcomed her. “It was a grass-roots organization and everything was woven in: your home life, your work life,” she says.

Mitcheom is just one of many staff members and clinicians who have found a career home at FHCHC, but that culture of continuity threatens to change as the clinic loses original staff members to retirement. The change is part of a larger generational shift in New Haven’s community health; fellow YSPH alumnus and executive director of the Hill Health Center, Cornell Scott, passed away in 2008, ending 40 years of leadership.

But the community’s need for affordable, accessible care endures. At FHCHC a new generation is stepping up, bringing with it new perspectives and skills. Brandon Pervis, a registered nurse at FHCHC, was birthed by midwife Mitcheom; behavioral health clinician Mark Austin’s late mother was one of FHCHC’s “founding mothers,” the affectionate clinic nickname for the indispensable neighborhood women who served as staff and support during the clinic’s earliest days.

Prenatal nurse Tila Suarez was, like Pervis, birthed by a clinic midwife, and her mother remains a patient. FHCHC became a kind of sacred space for Suarez at an early age. “I was a bad asthmatic as a kid, and I have countless stories of the clinic being there for me, opening after hours. My mom didn’t have a car, she had a 10-speed bike, and she would bring my brothers and me to the clinic that way. That was our minivan,” she says. Sitting in the waiting room as a child, she imagined her future as a nurse, at FHCHC. “I know it sounds corny, but I just knew I wanted to be here.”

Clark beams when she speaks of the young patients, now grown, who have returned. “There are buildings, the growth, all the numbers. But what gives me the most pride is to see these kids,” she says. Her excitement about the next generation continues when she tells the story of HAVEN Free Clinic, the primary care walk-in clinic founded and

staffed by students from the Yale schools of public health, medicine and nursing. FHCHC houses the Saturday clinic and provides supervising clinicians. To have a new clinic fostered by FHCHC brings everything full circle for Clark. “Watching them really brings me back to our early days,” she says.

## Passing the baton

The June celebration marks the end of an era, as Clark hands over leadership to the clinic’s new executive director, Suzanne Lagarde, M.D. Clark, who is leaving to spend more time travelling and to be with family, says it’s the commitment of the staff and the “new vision and energy” that Lagarde brings that allow her to move on.

Lagarde inherits the clinic at a time of great change. Foremost is the Affordable Care Act and how it might impact the clinic and its patients. It is the promise of universal health care that set Clark, and others, on this journey 40 years ago. Yet, with a large undocumented patient population that is ineligible, the real benefit to the Fair Haven community remains in question. Come what may, the doors to FHCHC will stay open to all residents in need.

As the evening draws to a close, the emotion in the room is palpable. “It almost feels like mom’s leaving,” Suarez later says of Clark’s departure. And it is the feeling of family that pervades, as the many people from FHCHC’s past, present and future gather with others from the New Haven health care community and political leaders, including DeLauro, state Sen. Martin M. Looney and Mayor John DeStefano, to celebrate a woman whom New Haven Health Director Mario Garcia, M.D., MSC., M.P.H. ’02, refers to as “an icon.”

Clark is uncomfortable in the spotlight, but with her certificate of “lifetime friendship” presented by longtime staffer Maria Melendez held closely, and her team all around, she gives thanks to all in attendance.

“We built something together,” she says. YPH

*Lindsay Whalen is a freelance writer in New York City.*

*Editor’s Note: Katrina Clark received the AYAPH Distinguished Alumni Award on Alumni Day 2013 in October. The award recognizes the contributions and achievements of alumni who have had distinguished careers in public health as outstanding teachers, researchers or practitioners.*

# Alumni News

## 1970s

**Katrina Clark**, M.P.H. '71, retired after 40 years as director of the Fair Haven Community Health Center. Founded in August 1971 under the leadership of a community advocacy agency known as the Alliance for Latin American Progress, the clinic opened in a local elementary school two evenings a week. Today, it has a large building of its own and has some 65,000 patient visits annually. See full story beginning on page 38.

**James R. Gonzalez**, M.P.H. '78, has been confirmed as president and chief executive officer of University Hospital in Newark, N.J. He had been serving in an interim capacity since July 2011.

## 1990s

**Patricia J. Checko**, M.P.H. '81, Dr.P.H. '96, was granted the C.-E.A. Winslow Award by the Connecticut Public



Health Association in recognition of four decades of exemplary public health leadership with the Connecticut Association of Directors of Health and MATCH, a statewide coalition to reduce tobacco use, as well as for her commitment to scholarship and her unwavering dedication to health equity and social justice.

**Tassos C. Kyriakides**, Ph.D. '99, was named a mentor for the inaugural summer program of Olympism for Humanity, held in Olympia, Greece. The International Olympic Academy and the Conflict Resolution Program

of the Department of Government at Georgetown University started this global venture with the aim of advancing olympism; peace building; and international development, scholarship and practice.

**Gloria J. Long**, M.P.H. '91, has been named the chief operating officer for the Guam Regional Medical City, a private hospital for Guam and the Micronesia region that will open in 2014. It is operated by The Medical City, a 40-year-old network of health care organizations based in the Philippines.

## 2000s



**Sanjay Basu**, Ph.D. '08, M.D. '09, and **David Stuckler**, M.P.H. '06, Ph.D., published a new book, *The Body Economic: Why Austerity Kills*. David and Sanjay mined data from around the globe and throughout history to show how government health policies become a matter of life and death during a financial crisis.

### Have an update?

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



After two years in the Epidemic Intelligence Service at the Centers for Disease Control and Prevention (CDC), **Allison Brown**, M.P.H. '04,

accepted a permanent position with CDC's Enteric Diseases Epidemiology Branch. Additionally, in May 2012, Allison married Robert Brooks Pugh, Jr. in Aspen, Colo.

**Albert Fallick-Wang** (formerly Albert Wang), M.P.H. '01, was featured in a solo show of conceptual photographs at the Salt Lake Photo Collective gallery in Utah. His documentary work is based on the usage of Google Street View and Google Earth combined with personal or political subjects. Last summer, he married Katrina Fallick, and the couple now has a daughter named Isadora-Hsing Fallick-Wang.

**Betsy P. Luo**, M.P.H. '00, M.D., is a comprehensive ophthalmologist and eye disease and surgery specialist with her family's firm, Progressive Vision Institute in Pennsylvania, founded by her father.

**Stephanie Scarmo**, M.P.H. '06, Ph.D. '09, had a recent publication, "Skin carotenoid status measured by resonance Raman spectroscopy as a biomarker of fruit and vegetable intake in preschool children," selected to be featured in *Nutrition Frontiers*. The article was chosen based on scientific merit, innovation and potential public health impact.



**Back to school.** Dean Paul Cleary chats with incoming M.P.H. student Kara Stencel during the annual picnic on the lawn of LEPH that marks the beginning of the academic year. New students had several days of orientation in late August before starting their public health coursework.

### Commencement 2013

#### Close-knit class urged to advance public health, persevere and remain grateful.

A review of the public's health in 2013 finds that there is much troubling news. Obesity is rampant; diabetes is on the rise; and many people live without access to health care. Unhealthy options are everywhere in modern society, and they are usually inexpensive and readily accessible.

But as more than 100 freshly minted Yale School of Public Health graduate students received their diplomas on May 20 and prepared to launch careers dedicated to lessening disease burdens and health disparities, there was hopefulness.

Dean Paul D. Cleary noted that the graduates could have pursued careers that would likely offer far more money, but instead they selected a profession that helps all people directly on an essential level.

"I've developed a real and tremendous sense of optimism for our future," Cleary told the graduating class and hundreds of their family members and friends who traveled from around the world to witness the ceremony inside Yale's historic and scenic Battell Chapel. The graduating M.P.H., Ph.D. and M.Sc. students will join the ranks of more than 4,000 School of Public Health alumni who work and live in more than 70 countries worldwide.

Student speaker Jasmine Carver reflected on the two-year journey that she and her School of Public Health

classmates have completed – and on what lies ahead.

The graduating class, she said, bonded during the course of a public health education that included more than 1,000 hours of classroom instruction, the writing of many papers, numerous tests, the reading of lengthy books, a challenging 10-week summer internship in locations around the world (Carver's was in Haiti), public health seminars and informal encounters in which the students learned from one another. The graduates helped one another through a challenging program, assisted by family, partners and faculty.

And now, she said, with their diplomas in hand, the members of the graduating class will find that life will quickly become very different





for them. Some will pursue research, others will teach, and still others will become clinicians or advocates.

“We will take part in the battles against malaria, asthma and obesity,” she said.

But no matter where the graduates end up, Carver offered some hopes and resolutions for the class as its members disperse and find their careers in public health: to remain grateful for what they have; to continue to appreciate what they experienced and learned at Yale; to stay connected to one another; and to make contributions that advance public health.

“I know as a group we are going to do some good,” she said. “We should be so excited to enter this next phase.”

Mayur M. Desai, M.P.H. '94, Ph.D. '97, associate professor in the



Graduating M.P.H. student Raj Kumar and his classmates enjoy a light moment during Commencement inside Yale's Battell Chapel.



# “My failures taught me perseverance.”

– *Nirav Shah*

Commencement keynote speaker Nirav Shah applauds the many accomplishments of the Class of 2013.



Department of Chronic Disease Epidemiology and the school’s 2013 Teacher of the Year, noted that the graduates came to Yale from all around the world to study public health. Once at Yale, they fanned out around the globe to put their education to use during their summer internships. The class was also active in efforts closer to school – improving health in New Haven and raising money for worthwhile causes.

“This is a class that is too modest to boast about its accomplishments and activities,” Desai said. “They have made us all proud and will continue to do so in the future.”

The Commencement keynote speaker, Nirav Shah, M.D. ’98, M.P.H. ’98, New York State Commissioner of Health, told the gathering that public health has many of the answers to what ails health and health care today. The graduates’ top challenge will be advancing disease

prevention. As much as 40 percent of early deaths in the United States are avoidable, and public health is all about addressing this missed opportunity.

Shah also spoke about the social determinants of health. Zip code, he said, has a greater effect on a person’s health than his or her genetic code. Such factors as social environment, education and income are directly tied to one’s well-being. Calling the next phase of public health Public Health 3.0, Shah said that the challenge of overcoming the social determinants of health will require public health professionals to work in concert with other members of the community, such as zoning board officials, architects, industrialists and politicians.

“We must expand the definition of health beyond the four walls of the hospital,” he said.

Shah also shared the trajectory of his career with the graduates. While he

now oversees one of the largest public health departments in the country, he admitted that he had frequent failures along the way. One paper that he authored, for instance, was rejected for publication six times before it was accepted. His first grant application took him three months to write and was not even reviewed. A brief e-mail rejection, he noted, even misspelled his name.

“My failures taught me perseverance,” Shah said. “I’m sharing this story because I believe that you, too, will find ways to persevere in your careers.”

*Michael Greenwood*



**MEDECINS SANS FRONTIERES**  
**DOCTORS WITHOUT BORDERS**

## Humanitarian medicine under attack

The international president of Médecins Sans Frontières recounts a spate of violence against his organization and what it means for those who need care the most.

Each year, Médecins Sans Frontières provides essential medical services to the world's most underserved populations in some of the most remote and often dangerous locations.

Its medical teams go to these places to relieve human suffering and to promote humanitarianism. The organization helps anyone in medical need regardless of political affiliation, religious beliefs or any other factor. It refuses to take sides in any conflict. It is neutral—always.

Despite this nonpartisan approach, Médecins Sans Frontières (also known as Doctors Without Borders or MSF) is increasingly targeted in some of the countries that it serves. The organization has suffered a spate of violence against both its personnel and its facilities within the past 18 months, forcing it to curtail services—which in turn denies people the medical care that they desperately need.

“It is safe to say that humanitarian medical action is in danger,” Unni Karunakara, M.P.H. '95, Dr.P.H., MSF's international president, said during a Dean's Lecture in April at YSPH. “[This situation] means thousands of people who need medical attention do not get it, because they are too afraid to seek it, or because it is not safe for medical staff to deliver it.”

“It is safe to say that humanitarian medical action is in danger.”

—Unni Karunakara

Unni Karunakara, international president of Médecins Sans Frontières.



Karunakara outlined a long and grim list of murder, abductions, threats, vandalism, intimidation and looting that have been directed at MSF staff members and patients within just the past few years. The violence includes the following incidents:

- In Somalia, two MSF aid workers were abducted more than 560 days ago and remain in captivity. The organization continues to work for their release. Two other MSF staff members were killed in Mogadishu in 2011. MSF's medical assistance has been curtailed as a result.
- Syria's government has refused to allow MSF personnel into government-controlled areas of the country despite requests. MSF currently operates three field hospitals in areas of the country not under government control, meeting a small fraction of the need. Syria has been in the midst of a civil war since March 2011.

- In Mali, MSF personnel were not allowed to cross front lines during recent fighting, and injured people could not get to health clinics. Civilians and some members of security forces died as a result.

- In Yemen, an MSF-supported hospital closed last September after armed intruders entered the grounds and opened fire.

Formed in 1971 by French doctors in response to the conflict in Biafra, MSF today has some 35,000 personnel working in 70 countries around the world. Last year, Karunakara said, MSF provided medical care to over 8 million patients.

It was while studying public health at Yale that Karunakara became interested in working with underserved people. He was on his way back to Yale from a Downs Fellowship research site in South Africa in 1994 when he met an MSF worker at the airport in Brussels. He learned about a tuberculosis control program that was being started in Ethiopia and was eager to

“Drs. Desai and Forman are ‘best of the best’ educators.”

– Dean Paul Cleary



Mayur Desai

join it. He finished his studies at Yale and was so excited to start work on the project that he missed Commencement. Friends created an effigy of him complete with graduation regalia for the ceremony.

“At Yale, I learned that medicine had very little to do with health and that it had everything to do with society, politics, economics, the law and the environment,” Karunakara told the large audience in Winslow Auditorium. “Here, I became concerned about the health of the disadvantaged, the neglected and the voiceless. It was here that I learned about the notions of equality and equity. Here, I came to believe that all human beings, no matter their race, creed or beliefs, had the right to health care. Here, I became a humanitarian.”

Karunakara outlined what he believes must be done if the practice of medical humanitarianism, including the preservation of the moral principles and medical ethics of health work, is to prevail. He noted a vaccination program allegedly carried out by the CIA in Pakistan to gather information on the whereabouts of Osama bin Laden. Such activities, or even the perception of them, breed mistrust.

It is vital that the meaning of medical humanitarianism—humanity, impartiality, neutrality and independence—be stressed and that ongoing dialogues be maintained with all communities, authorities and leaders. Karunakara said that it is also important to highlight the consequences of violence against such organizations as MSF and the toll that it takes on everyone. “We need to act.”

*Michael Greenwood*

*Editor’s Note: Unni Karunakara stepped down as president of MSF in October to bicycle across India to raise awareness and money for the organization*

### Recognizing excellence

**Mayur Desai acknowledged with top honor for the second time; Howard Forman presented with mentorship award.**

Learning epidemiologic methods in an intensive seven-week summer session and mastering the intricacies of the SAS software program for data analysis can be difficult and frustrating.

But students in Mayur M. Desai’s “Accelerated Epidemiology” and “Applied Analytic Methods in Epidemiology” courses describe their immersion in research methodology and the powerful computer program in a single word: “Fun.”

Desai’s ability to bring epidemiology and data analysis—and their public health applications—to life did not pass unnoticed by M.P.H. students graduating this year. They selected Desai as the School of Public Health’s 2013 Teacher of the Year in an online ballot—an honor that he had also received in 2009.

“Dr. Desai is one of the best teachers I have ever met,” one student wrote on behalf of Desai’s nomination. “[He] excels at presenting complex epidemiological concepts. ... [and] is also extremely sensitive to students’ needs and concerns. His classes are interactive, and he always makes sure to use real-life examples while teaching.”

Desai, who has been with the School of Public Health since his days as a student in the early 1990s, said

that teaching public health continues to be his passion.

“Teaching the next generation of leaders in public health research and practice is a joy and a privilege,” said Desai, M.P.H. ’94, Ph.D. ’97, associate professor in the Department of Chronic Disease Epidemiology and director of YSPH’s Advanced Professional M.P.H. Program. “I’m deeply honored by this award. It’s a wonderful feeling, knowing that I’ve been able to help our graduates develop critical skills as they enter the next phase of their careers dedicated to improving health and health care for all.”

Desai’s colleague, Howard P. “Howie” Forman, M.D., director of the Health Care Management Program at YSPH and professor of diagnostic radiology, economics, management and public health, received the school’s Distinguished Student Mentoring Award. The honor recognizes people who are shaping the next generation of public health professionals.

Writing in support of Forman’s nomination, one student said that Forman is the definition of a mentor and a great asset to the School of Public Health. “I remember moving to New Haven and having many thoughts of uncertainty. I was unaware of what my future would entail in this new town, but I knew that this next chapter in my life would be a pivotal moment. Fortunately, I found solace and guidance with Dr. Howard Forman, who



Howard Forman

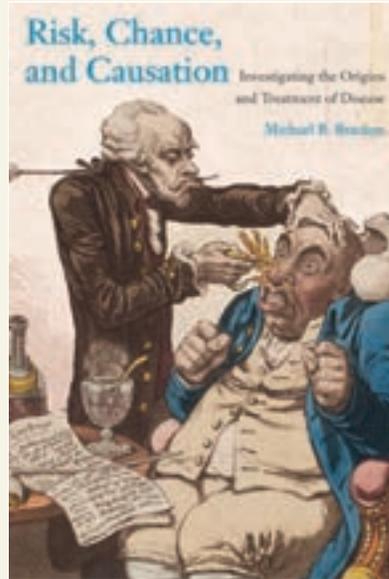
reached out to me before class began to meet over coffee,” the student wrote. “There, he warmly reassured me of my decision to pursue a degree at Yale. From that point on, my interactions with him have always been casual and friendly.”

To meet the criteria for the mentoring award, recipients are expected to be a role model for their students, convey their passion for public health and encourage students to achieve their full potential. Forman was nominated by graduating students and selected by a student/faculty subcommittee of the Education Committee. Forman said he was honored to receive the award, noting that “mentoring is a lifelong opportunity to help others, not limited to our professional areas of expertise.”

Dean Paul D. Cleary said that the School of Public Health is fortunate to have the dedication and expertise that both Desai and Forman bring. “Drs. Desai and Forman are ‘best of the best’ educators. Their skills, responsiveness to student queries and interests and dedication to providing an outstanding learning experience are ‘best practices’ for all of us to emulate,” he said.

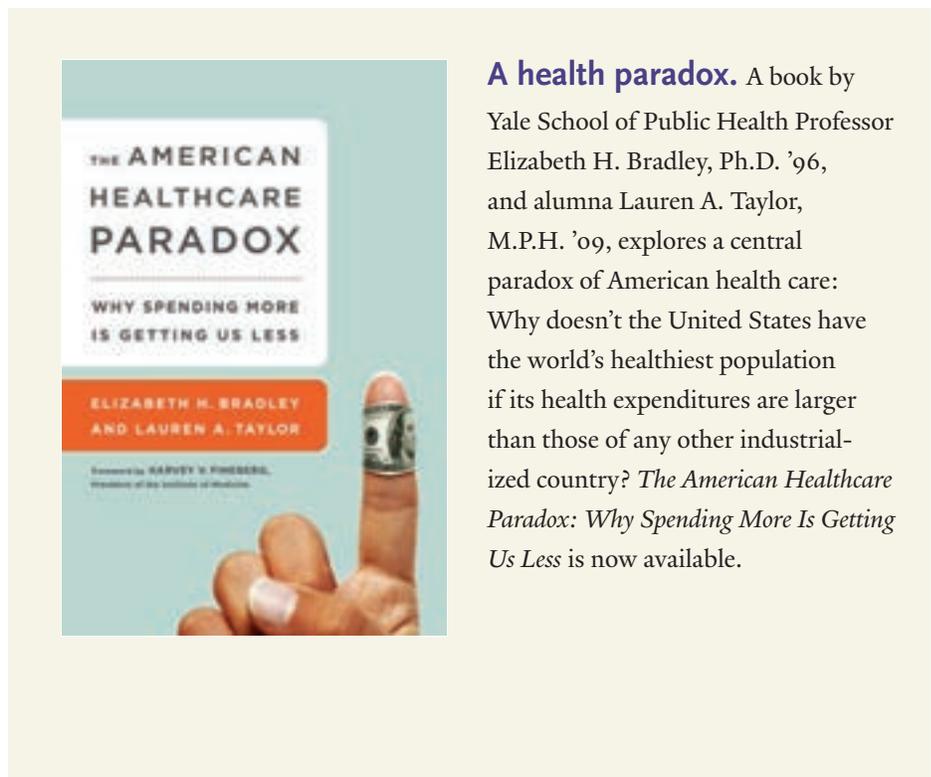
Both educators were honored at Commencement on May 20.

M.G.



### How epidemiology works.

In his recently released book, *Risk, Chance, and Causation: Investigating the Origins and Treatment of Disease*, Michael B. Bracken, M.P.H. '70, Ph.D. '74, the Susan Dwight Bliss Professor of Epidemiology at the Yale School of Public Health, explores the workings of clinical epidemiology. The book describes how professional scientists approach questions of disease causation, in order to provide readers with the tools to help them understand whether warnings of environmental risk are warranted or whether claims of therapeutic benefit can be justified.



**A health paradox.** A book by Yale School of Public Health Professor Elizabeth H. Bradley, Ph.D. '96, and alumna Lauren A. Taylor, M.P.H. '09, explores a central paradox of American health care: Why doesn't the United States have the world's healthiest population if its health expenditures are larger than those of any other industrialized country? *The American Healthcare Paradox: Why Spending More Is Getting Us Less* is now available.



**Spring fling.** Yale School of Public Health alumni, students and faculty came together on April 19 for the school's annual Spring Fling celebration. The get-together is the school's major alumni/student networking event and coincided this year with the Yale Healthcare Conference. This year's gathering, held at Barcelona New Haven restaurant, featured the larger-than-life and life-of-the-party Handsome Dan mascot.



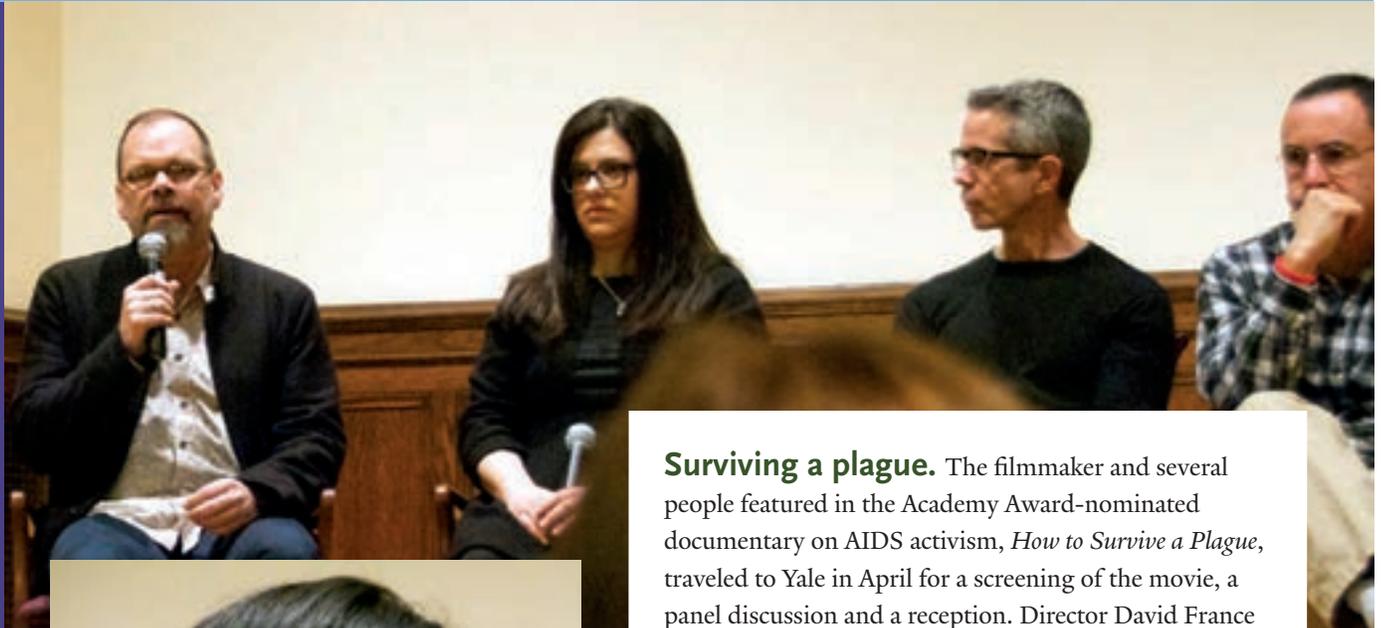


Malia Carpio, a joint-degree student at the Yale schools of public health and forestry & environmental studies, records data during a tick drag in a heavily wooded area of Block Island known as The Maze.

Assistant Professor Maria Diuk-Wasser (second from right) and three research assistants hike to a study site in Rodman's Hollow on the southern end of Block Island.



**Summer on Block Island.** Summertime on Block Island is not beaches and fun for Yale School of Public Health scientists. Several researchers spent the season on the popular tourist island to collect the ticks that are responsible for Lyme disease, babesiosis and other illnesses. The work took the scientists into some of the island's most remote regions – the places tourists almost never visit and where ticks abound.



**Surviving a plague.** The filmmaker and several people featured in the Academy Award-nominated documentary on AIDS activism, *How to Survive a Plague*, traveled to Yale in April for a screening of the movie, a panel discussion and a reception. Director David France was joined by three activists featured in the 2012 film: Peter Staley, Garance Franke-Ruta and Gregg Gonsalves. The movie traces the origins and tactics of two groups, the AIDS Coalition to Unleash Power (ACT UP) and the Treatment Action Group (TAG), in the 1980s and 1990s and their struggle against the AIDS epidemic.



*Top:* Director David France's debut film, *How to Survive a Plague*, was nominated for an Academy Award. France (left) participated in a panel discussion on the film, along with several of the people featured in it.

*Above:* Garance Franke-Ruta, now a journalist for *The Atlantic* magazine, joined ACT UP when she was 17 years old. She earned her high school diploma by passing the GED test, took courses at Hunter College and transferred to Harvard University in 1992.

*Right:* Gregg Gonsalves quit college in the 1980s and became increasingly active with ACT UP and TAG in the fight against AIDS. He recently earned his bachelor's degree from Yale and is now a Ph.D. candidate at the Yale School of Public Health.





### Lux et statistica

**Young Scholars explore science and statistics—and have some fun during intensive academic summer camp.**

Thirteen high school students from as far as Arizona arrived in New Haven during July for a rigorous two-week program in statistics, science and programming, along with some camaraderie, at the Young Scholars Program offered by the Yale Center for Analytical Sciences (YCAS).

Now in its fourth year, the program at the School of Public Health exposes students to advanced concepts in math and science and potentially inspires them to pursue related fields. One of the camp’s cornerstones is training in R statistical software, an open-source program that is changing the field of biostatistics.

In addition, students had the opportunity to sit and converse with faculty from the Yale schools of medicine and public health and to participate in a biostatistics course taught by Veronika Northrup, a Ph.D. candidate and former YCAS director of biostatistics resources.

“The greatest value of this program is that it invites students to notice those things they never expected to see. But isn’t that the same for any good teacher?” said William C. King, Ph.D. ’10, executive director of YCAS and the program’s founder.

Students also spent several hours each day in computer classes taught by John W. “Jay” Emerson, Ph.D. ’02, associate professor of statistics at Yale; and Owais Gilani, a Ph.D. candidate in biostatistics and teaching fellow at the Yale School of Public Health.

“It was fascinating to see how quickly these students picked up

“It is the kind of program that turns a good summer into a fantastic summer.”

—*Jesus Abraham Morales-Sanchez*

The Young Scholars attend biostatistics lectures alongside physicians and researchers from Yale University.



## YSPH Notes

programming,” said Gilani. “We provided them with the basic tools of working with data, and soon enough they were pushing beyond what was taught and exploring what else R has to offer.”

The program’s young participants were impressed as well. “Yale Young Scholars was great. It not only gave us all the opportunity to learn something new, but it also opened the doors to different sciences, languages and cultures and even different kinds of food. It is the kind of program that turns a good summer into a fantastic summer,” said Jesus Abraham Morales-Sanchez, a student at Wilbur Cross High School in New Haven.

In addition to students from high schools in New Haven, Hamden and Meriden, King invited four students from the Ha:san Preparatory and Leadership School in Tucson, Ariz. The school’s mission is to close the gap in high school graduation and college attendance rates between Native American youth and the general population.

At the program’s conclusion, the Ha:san students said their goodbyes and expressed their gratitude for the unique opportunity with a traditional ceremonial Tohono O’odham song at the busy entrance of 300 George St.

See a video of the Ha:san students’ song at: <https://www.facebook.com/photo.php?v=401180356658416&set=vb.362356313874154&type=2&theater>.

*Denise Meyer*



*Top:* William King helps students with the intricacies of R programming software. King, the executive director of the Yale Center for Analytical Studies, founded the Young Scholars Program four years ago. This year—for the first time—it included four Native American students who traveled from Arizona to attend.

*Above:* Two alumni of the Young Scholars Program, Brad Watson and Megan Carroll, served as mentors this year. In addition to providing support to the incoming students, Watson and Carroll are writing and producing a series of videos on statistics for high school students.



**Space for public health.** An entire floor of a building now under construction at 100 College St. is reserved for the School of Public Health. The 40,000-square-foot space is the equivalent of about four floors of the Laboratory of Epidemiology and Public Health (LEPH), the school's main building. The new building will sit directly next to LEPH and will provide much-needed room for faculty, staff and students. Dean Paul D. Cleary is soliciting ideas on how to organize and use the new space. The 11-story building is expected to be completed in mid-2015. Anchored by Alexion Pharmaceuticals, it will include space for other Yale-affiliated offices, including some for the Yale School of Medicine. "Something that looks like a big ugly hole for a long time will all of a sudden become a big beautiful building," Cleary said.

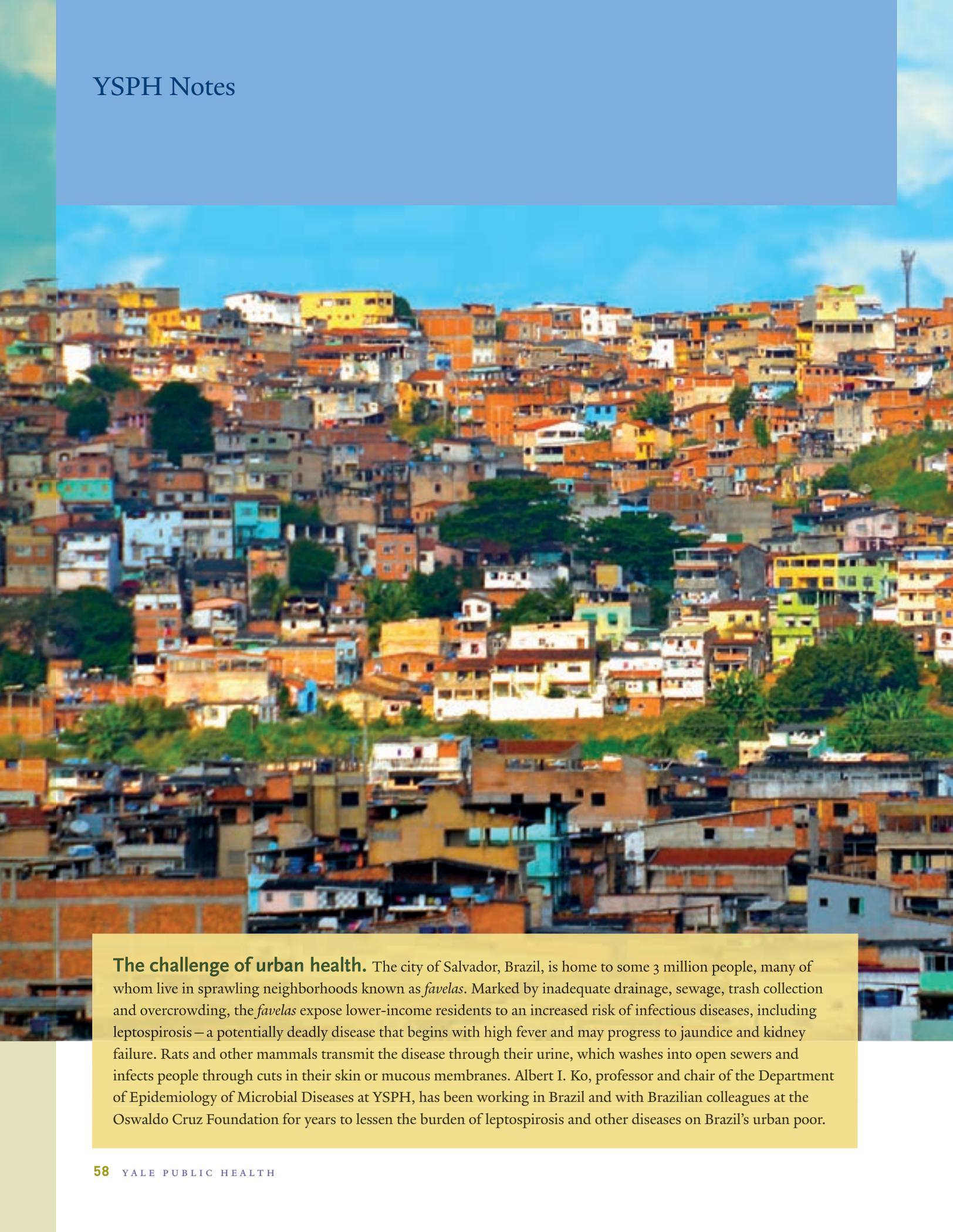




**Global health.** Then-Yale President Richard Levin addresses the 2013 Global Health Leadership Institute conference at the Greenberg Conference Center on Prospect Street. Health professionals from several countries – Brazil, Ghana, Uganda and Trinidad and Tobago – participated in the weeklong event in June. Delegations work with Yale faculty and other experts on a health problem unique to their country and come up with an action plan to address the issue. The annual conference started in 2009.



**New state law.** Connecticut Gov. Dannel P. Malloy displays legislation restricting minors' access to indoor tanning salons. The governor signed the health measure in July during a ceremony in his office at the Capitol. A Yale School of Public Health study completed last year identified a strong association between indoor tanning and basal cell carcinoma, a form of skin cancer, in young people in Connecticut. The study contributed important data to existing research on melanoma, the most lethal form of skin cancer, to secure passage of the new law. Malloy congratulated lawmakers, scientists and advocates for their combined work on legislation that will protect Connecticut's youth. The law prohibits people under 17 years old from using indoor tanning facilities. Among those attending the ceremonial signing were Susan T. Mayne, Ph.D. (right), the C.-E.A. Winslow Professor of Epidemiology at YSPH and the study's senior author; and Leah M. Ferrucci, Ph.D. '06 (third from right), an associate research scientist at YSPH and the study's lead author. Lt. Gov. Nancy Wyman is to the left of the governor.



**The challenge of urban health.** The city of Salvador, Brazil, is home to some 3 million people, many of whom live in sprawling neighborhoods known as *favelas*. Marked by inadequate drainage, sewage, trash collection and overcrowding, the *favelas* expose lower-income residents to an increased risk of infectious diseases, including leptospirosis – a potentially deadly disease that begins with high fever and may progress to jaundice and kidney failure. Rats and other mammals transmit the disease through their urine, which washes into open sewers and infects people through cuts in their skin or mucous membranes. Albert I. Ko, professor and chair of the Department of Epidemiology of Microbial Diseases at YSPH, has been working in Brazil and with Brazilian colleagues at the Oswaldo Cruz Foundation for years to lessen the burden of leptospirosis and other diseases on Brazil’s urban poor.



# REIDS

Research Education Institute  
for Diverse Scholars

## Tomorrow's AIDS researchers

### A program with ties to YSPH fosters research to stem epidemic, reduce disparities.

The AIDS epidemic has many layers and differs from society to society, but some practical ideas for stemming the disease can be found at the Research Education Institute for Diverse Scholars (REIDS).

During a July workshop titled “Closing the Gap: Advancing Health Equity in HIV Through Community-Based Research,” held at the Omni New Haven Hotel, seven REIDS scholars presented preliminary findings from their community-focused research projects. Their work raises critical questions and has the potential to address the disproportionately high rates of HIV infection within the African-American community.

David M. Stoff, Ph.D., program officer for REIDS at the National Institute of Mental Health (NIMH), told the scholars in his opening presentation that national definitions of diversity must be broadened and that “we have a lot more to do, but we’re on the way.”

REIDS is a collaborative project among the Yale School of Nursing; the Center for Health, Intervention, and Prevention at UConn; the Center for Interdisciplinary Research on AIDS at Yale; and the Institute for Community Research in Hartford, Conn.

Among the REIDS scholars presenting was Jennifer Stewart, Ph.D., who examined the feasibility of HIV testing at four African-American churches in Philadelphia. The congregations ranged from one with HIV testing already in place to one that resists such testing. Stewart found that participants expressed comfort with being tested at a church and even with having a minister present when learning their test results.

Another scholar, Jemel P. Aguilar, Ph.D., presented his work on the inadequate transitional HIV and mental health services available to HIV-positive men leaving Texas prisons. Aguilar found that men being released from prison were sometimes dropped at bus stations without a community or family member to meet them, into an environment where high-risk behaviors are easily renewed.

Other REIDS scholars examined the factors that drive HIV/AIDS incidence in Philadelphia neighborhoods where there is a high prevalence of AIDS; the frequency of condom use among African-Americans between the ages of 18 and 24; the risk of HIV among young pregnant women in Liberia; and the stigma of HIV/AIDS among Chinese-Americans. REIDS scholars are awarded up to \$20,000 from NIMH to conduct a community-based research pilot project on HIV-related health disparities in communities of color.

The REIDS program was designed to meet the challenges and barriers experienced by groups that are underrepresented in the field of HIV research. The two-year program, established in 2010, accepts four scholars each year to participate in a six-week summer institute for two consecutive summers. Currently, 12 scholars are enrolled in REIDS, which provides recent postdoctoral students and early-career faculty with sustained mentorship from an interdisciplinary team of senior research scientists in HIV prevention, treatment and health disparities.

Keynote speaker Loretta Sweet Jemmott, Ph.D., the van Ameringen Professor in Psychiatric Mental Health Nursing and Director of the Center for Health Disparities Research at the University of Pennsylvania School of Nursing, concluded the day’s presentations with a lively exhortation to the REIDS scholars titled “If Not Us, Who? If Not Now, When?”

The “code of the street” and the voices heard there would be the researchers’ best guides in transforming high-risk behaviors, said Jemmott, who is nationally renowned for the successful community-based HIV interventions she has developed and for her programs to prevent teen pregnancies.

*Anne Farrow*

### CIRA awarded new grant

**An HIV/AIDS center at Yale with partners and programs throughout the world is funded for the next five years.**

An HIV/AIDS center at Yale University that fosters research to improve HIV prevention and care programs from New Haven to Africa has received a new federal grant that will fund its initiatives for the next five years.

Paul D. Cleary, dean of the Yale School of Public Health and director of the Center for Interdisciplinary Research on AIDS (CIRA), announced the \$8.75 million award from the National Institute of Mental Health. The grant will fund CIRA's research activities and programs through mid-2018.

"Given the persistent challenges of the global epidemic, we are elated to have this opportunity to continue to support and advance HIV prevention and care research here in the United States and other parts of the world, including Russia, China and South Africa," said Cleary. "There is a substantial body of knowledge of what works to stem transmission and optimize health outcomes for those with HIV/AIDS that requires adaptation and implementation in the field to achieve the desired effect. This implementation science will be our primary focus in the next five years."

Since its inception in 1997, CIRA has supported a portfolio of interdisciplinary research in diverse settings, contributing significantly to scientific knowledge of HIV risk and transmission as well as the cost-effectiveness and efficacy of HIV interventions.



# cira

Center for Interdisciplinary Research on AIDS  
at Yale University

CIRA now has 150 affiliated research scientists and research partners who represent 27 disciplines, as well as various AIDS service and health care provider organizations. Over the years CIRA scientists have published some 2,000 papers on HIV/AIDS care and prevention. The center currently supports 49 active HIV research and training projects funded by external grants valued at nearly \$73 million.

Despite some tangible gains against the pandemic, serious challenges remain for HIV scientists, public health officials and care providers who aim to end the threat posed by HIV/AIDS. In the United States alone, some 1.2 million people are living with the virus, 18 percent of whom are unaware of their infection. Worldwide, there are about 2.5 million new infections each year, with some 34 million people presently infected. The virus is increasingly concentrated in communities of color and impoverished areas of the world where lifesaving drugs are unavailable or severely limited. In 2011 alone, close to 2 million people died from the disease.

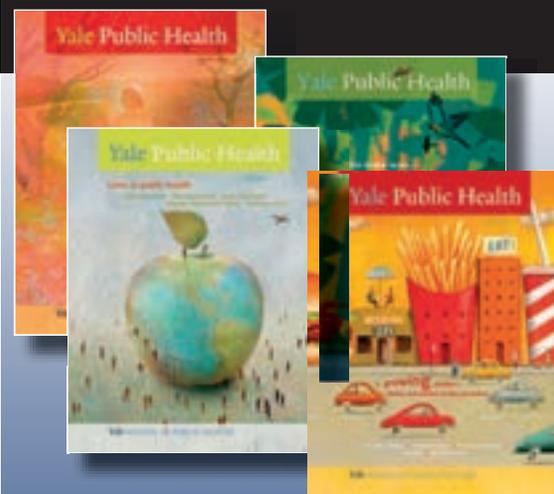
"HIV disparities, a resurgence of HIV in men who have sex with men in the United States, the rise of HIV-comorbid conditions and the aging of those with HIV disease are just some of the current issues that underscore the continued importance of CIRA's mission and work," said Cleary.

With the new grant, CIRA's mission will be adjusted to better address the current challenges posed by the disease. The center will support innovative and interdisciplinary research that combines behavioral, social and biomedical approaches focused on the implementation of HIV prevention and treatment and the elimination of HIV disparities.

*Michael Greenwood*

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**Care packages.** First-year M.P.H. students dispersed around the globe for their summer internships, but not before receiving care packages. The internship is a cornerstone of the M.P.H. experience and usually consists of 10 to 12 weeks of work in the United States or abroad. Each care package included a YSPH T-shirt, a power bar, hand sanitizer, a pamphlet with photo tips and emergency contact numbers. More than 100 students completed internships in locations as diverse as Cambodia, Spain, Lebanon, New Haven and Ghana.



### Awards and Honors Fall 2013

**Jonathan B. Borak, M.D.**, received the 2012 Harriet Hardy Award from the New England College of Occupational and Environmental Medicine (NECOEM). The award was bestowed on November 29 during NECOEM's annual conference in Newton, Mass., after which he presented a discussion on "Physical Environment Meets Social Environment: Implications for Health." Borak is a clinical professor of epidemiology and public health and clinical professor of medicine at Yale.

Five student members of Yale's Global Health Case Competition team, **Ryan Boyko** (YSPH Ph.D. candidate), **Jordan Slosower** (YSM), **Javier Cepeda** (YSPH Ph.D. candidate), **Hilary Rogers** (B.A./M.P.H. program) and **Yi Zhou** (SOM) took second place at the 2013 International Emory Global Health Case Competition in March.

**Michael B. Bracken, M.P.H. '70, Ph.D. '74**, the Susan Dwight Bliss Professor of Epidemiology in the Department of Chronic Disease Epidemiology and professor of neurology and obstetrics, gynecology and reproductive sciences at the Yale School of Medicine, has been named the recipient of the 2013 Abraham Lilienfeld Award. It is the highest honor bestowed by the American College of Epidemiology and is given for "outstanding contributions and leadership in the discipline of epidemiology."

**Kelly Brownell, Ph.D.**, former director of the Rudd Center for Food Policy and Obesity and professor of psychology and chronic disease epidemiology at Yale, has been named dean of Duke University's Sanford School of Public Policy.

**Gai Doran**, assistant director of the Center for Interdisciplinary Research on AIDS, won a travel award to attend the 2013 Pre-Award Research Administration Conference in New Orleans sponsored by the National Council of University Research Administrators.

*Business New Haven* named **Jeannette R. Ickovics, Ph.D.**, professor in the Social and Behavioral Sciences division and director of CARE: Community Alliance for Research and Engagement, one of its



Michael Bracken

2012–2013 Healthcare Heroes.

**Raj Kumar, M.P.H. '13**, presented his research results at the 3rd annual Traumatic Brain Injury Conference in Washington, D.C., in March. Raj studied the correlation between self-reported depression prior to having a concussion and recovery after three months. The data were collected during his 2012 summer internship at TIRR Memorial Hermann Hospital in Houston.

**Becca R. Levy, Ph.D.**, associate professor and director of the Social and Behavioral Sciences division, was

awarded an Ewald W. Busse Research Award at the 20th IAGG World Congress of Gerontology and Geriatrics in Seoul, South Korea, in June in recognition of her lecture titled "Aging Self-Stereotypes: Obstacle or Pathway to Health?"

**Shuangge Ma, Ph.D.**, associate professor in the Department of Biostatistics, was elected a fellow of the American Statistical Association.

The National Institutes of Health (NIH) presented **Susan T. Mayne, Ph.D.**, C.-E.A. Winslow Professor of Epidemiology, associate director of Population Sciences at Yale Cancer Center and chair of the Department of Chronic Disease Epidemiology, with the Stars in Nutrition and Cancer Award during a ceremony at the NIH campus. Her March lecture for the Stars in Nutrition series, "Micronutrients and Cancer Prevention: A Complex World.," can be viewed online.

**Reuben Ng**, a Ph.D. candidate in the Department of Chronic Disease Epidemiology, won the 2012 Tony D. Guzewicz Award for outstanding cross-cultural research from the American Psychological Association in October.

**Rafael Pérez-Escamilla, Ph.D.**, professor in the Department of Chronic Disease Epidemiology, has been appointed to the 2015 Dietary Guidelines Advisory Committee by the U.S. Department of Health and Human Services and the U.S. Department of Agriculture. The committee's recommendations and rationale will serve as a basis for the eighth edition of the Dietary Guidelines for Americans.

# Interested in improving health care systems?

Yale wants to put your expertise to use in the United States, China, Ethiopia, Rwanda, Tanzania and elsewhere.



The Yale Global Health Leadership Institute (GHLI) seeks YSPH and Yale alumni and industry experts with extensive experience in health care leadership and management to be a part of the Yale Healthcare Administration Resource Team.

Participants will be offered assignments based on openings that match their areas of competency.

GHLI builds capacity among health care administrators and professionals to improve the performance of health systems through leadership development, quality improvement programs and health systems research.

Advisers and consultants are needed for:

- Teaching assignments in GHLI Certificate and/or Masters of Healthcare Administration (MHA) programs in the United States and abroad.
- Advising MHA students with their second-year projects.

Contact program director Martha Dale at [martha.dale@yale.edu](mailto:martha.dale@yale.edu) or 203.436.8437 for more information.

GHLI is an affiliated program of the Yale School of Public Health.

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*Continued from p. 7*

retardants, among them TCEP, TDCPP and TCPP (as they are known), are currently used in children's and other consumer products, including upholstery foams and textiles where PBDEs might have been used previously. TCEP and TDCPP have been linked in animal studies to cancer and to adverse developmental, neurological and reproductive effects. Canada, the European Union and several U.S. states have begun to bar some of these compounds from children's products. Yet for the most part their use is still permitted. Meanwhile,

older products containing phased-out flame retardants remain in use and will eventually make their way into the waste stream.

Some manufacturers have begun redesigning products to avoid the need for chemical flame retardants. Some flammability standards—particularly for plastic foams—are being reassessed to facilitate compliance without flame-retardant chemicals. Flame retardants are also a focus of the U.S. Environmental Protection Agency's Design for the Environment program, which assesses alternatives to existing problematic chemicals. Manufacturers of flame retardants maintain that their

products are safe and necessary to protect lives and property.

So where does this leave us? Clearly, an improved system for assessing chemical products' environmental and health impacts is needed if we are to prevent still more regrettable substitutions—along with a strategic reassessment of how we design products for which fire resistance is a priority.

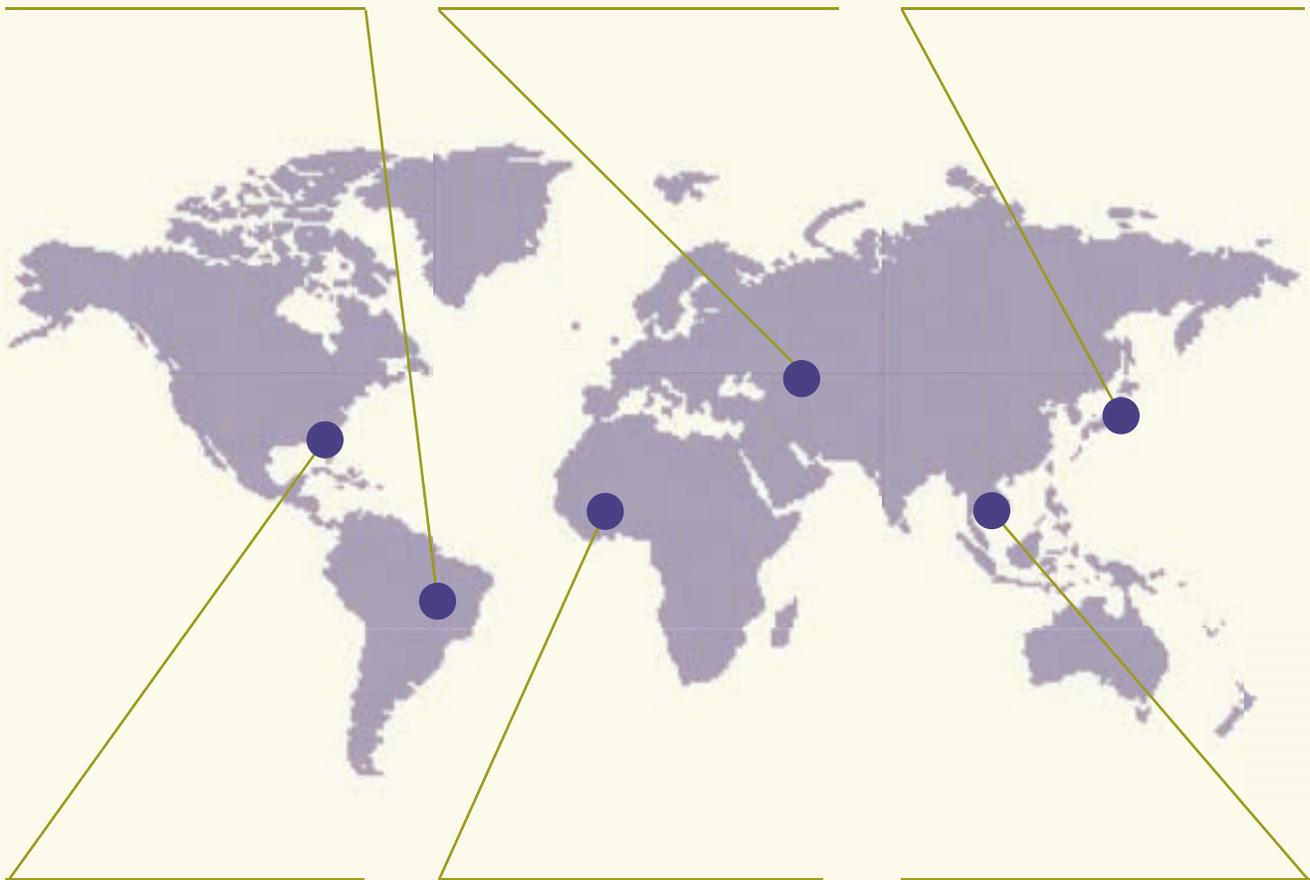
*Elizabeth Grossman is the author of several books on chemicals and health, including Chasing Molecules: Poisonous Products, Human Health, and the Promise of Green Chemistry.*

## YSPH around the world

**Brazil.** A YSPH professor serves as a senior adviser to the government's national household food security measurement project.

**Azerbaijan.** The Global Health Leadership Institute and its partners work to bring professional development programs in international health care management here and elsewhere.

**Japan.** A YSPH professor and colleagues have created a program to establish the first worldwide research and training program in evolutionary medicine.



**Everglades National Park, Florida.** YSPH researchers do fieldwork to determine the diversity and abundance of mosquitoes and arboviruses in and around Everglades National Park; their relationships with plant life; and their potential impact on public health.

**Burkina Faso.** In collaboration with local researchers, a faculty member studies the immunologic and genetic bases for differential susceptibility to malaria in two ethnic groups.

**Vietnam.** Two studies explore the impact of changing methods of responding to injection drug use in Hanoi.

## In Memoriam

Stanislav V. Kasl, 1934–2013

Internationally recognized psychosocial epidemiologist Stanislav V. “Stan” Kasl, Ph.D., a professor at the Yale School of Public Health for 42 years, died at home surrounded by family on June 9. He was 78 years old.

Stan was known for his work on the psychosocial epidemiology of aging and mental health epidemiology and served as director of the Social and Behavioral Sciences Program from 2002 to 2003 and as head of the division of Chronic Disease Epidemiology from 2003 to 2009.

He researched and wrote widely on many issues pertaining to psychosocial epidemiology, the study of social and psychological risk factors for physical illness. In addition to seminal research on job loss and stress, his research interests – reflected in more than 300 publications – included incidence of disease; course of illness and disability; psychiatric epidemiology; the study of risk factors for psychiatric outcomes; and aspects of mental health and well-being. His work contributed to the understanding of determinants of mortality, morbidity and disability in elderly individuals and elderly couples; race differences in cancer stage at diagnosis, as well as screening behaviors and survival; and influences of religion on health and functioning.

Stan received numerous awards for his research and mentorship, including a Lifetime Career Achievement Award co-conferred by the American Psychological Association, the National Institute of Occupational Safety and Health and the Society for Occupational Health Psychology. He also received the Distinguished Mentor Award, presented by the Behavioral and Social Sciences Section of the Gerontological Society of America.

Stan was known for being very supportive of his mentees’ research and career aims, always having an open-door policy with his trainees and colleagues and providing honest and perceptive guidance. Throughout his career, he worked as adviser and mentor for about 40 doctoral students and 60 postdoctoral students. He supported many of his mentees with two training grants, one from the National Institute on Aging and one from the National Institute of Mental Health.

Born in 1934 in Prague, in the former Czechoslovakia, he moved with his parents and sister to Marienbad in 1945. The family later escaped from the Communists by walking across the border into Germany in 1948. He was sent to live on a farm in Switzerland while the rest of his family was



Stanislav “Stan” Kasl

relocated to a refugee camp in Italy. After about a year he rejoined his family in Milan, where they waited for permission to immigrate to the United States. Immigration papers were issued in 1950 and the family arrived by boat that year.

Stan earned his bachelor’s degree from Yale University in 1957 (summa cum laude) and his Ph.D. in social psychology in 1962 from the University of Michigan. He worked for several years at the University of Michigan as a researcher at the Institute for Social Research before joining the faculty at the Yale School of Public Health in 1969 as an associate professor.

At Yale, Stan became a professor in 1974 and served as the director of graduate studies for a 10-year period beginning in 1984. He had several appointments as a visiting professor, including one at the University of London in 1986 and another at the University of Tasmania in 1992.

Stan also served on numerous study sections and scientific advisory boards and on the editorial boards of many prestigious journals, including the *American Journal of Epidemiology*, *Journal of Behavioral Medicine*, *Journal of Clinical Epidemiology*, *Journal of Gerontology: Social Sciences* and *The International Journal of Psychiatry in Medicine*. He was a member of the American Public Health Association, the Gerontological Society of America, the Society for Epidemiologic Research, the International Epidemiological Association and the American Psychosomatic Society.

Stan enjoyed hiking, traveling and sharing fine meals and wine with colleagues and family. He retired from Yale in 2011 and became a professor emeritus. He is survived by his wife, Elizabeth Kasl, Ph.D.; his daughter, Julia Kasl-Godley, Ph.D.; his son, Jan Kasl; and three grandchildren: Brooke, Sierra and Autumn Kasl-Godley.

# In Memoriam

**John Robert Bernier, M.P.H. '56**, of Clearwater, Fla., died on March 7 at the age of 83. Born in Dorchester, Mass., he worked for the American Heart Association for many years. John leaves behind a wife, a daughter, two sons and two grandsons.

**The Rev. Patricia R. Colenback, M.P.H. '66**, of Fall River, Mass., died on February 12 in Holyoke at the age of 81. She grew up in New Jersey, where she attended the Dwight School for Girls. She did her undergraduate work at Smith College and the University of Colorado at Boulder and received a master's degree from the Episcopal Divinity School. Patricia enjoyed a robust career in public health before starting a second career at age 60, when she was ordained as an Episcopal priest.

**Victor Crown, M.P.H. '69, Ph.D.**, of Philadelphia died of complications from congestive heart failure on December 26 at the age of 90. He was retired from the University of Pennsylvania medical school, where he had served as associate executive vice president of the Penn Medical Center and as special assistant to the dean. Victor attended Overbrook High School and began his undergraduate studies at Penn State before entering the Army during World War II. He served in the Army Air Corps and later in the Medical Corps, performing anesthesiology in mobile surgical units in the Pacific Theater. After finishing his bachelor's degree, he formed the company Arrow Uniform with his older brother. At the age of 45, Victor left the business world to follow his lifelong passion for medicine. He studied at the London

School of Economics, the London School of Hygiene & Tropical Medicine and the University of Pennsylvania, where he received his doctorate.

**Diana B. Fischer, M.P.H. '66, Ph.D. '74**, formerly of Hamden, Conn., and most recently of Wellesley, Mass., died on March 20 at the age of 79. She was born in Mount Vernon, N.Y., and graduated from Mount Holyoke College in 1956. Diana taught at the Yale School of Public Health; was a researcher with the Yale University School of Medicine Department of Therapeutic Radiology, where she contributed to numerous publications in the advancement of cancer treatment; and later headed the Cancer Center's tumor registry. She was an active member of the community in Hamden, serving as president of the East Side Civic Association. In 1998, the Connecticut General Assembly presented Diana with a citation "in recognition of her outstanding commitment and dedication to the good of her community for her efforts to preserve the environmental quality of the tidal wetlands of the Quinnipiac River."

**Claudia Blanche Galiher, M.P.H. '45**, died in Bethesda, Md., on April 5. A native Washingtonian, she earned her liberal arts degree from Trinity College, Washington, D.C., in 1938 with a major in sociology. She was recognized worldwide as an expert in public health education and in 1955 became executive director of the newly combined Montgomery County Tuberculosis and Heart Association. From 1956 to 1958, at the invitation of the Ford Foundation, Claudia spent two years

in India developing health education programs. In 1962, she joined the Peace Corps as a health education consultant in the medical program division. For many years, Claudia was an instructor in public health administration at the Johns Hopkins School of Hygiene and Public Health.

**Henry Compton Gift, M.P.H. '77, M.D.**, of Wolcott, Conn., died unexpectedly on March 20 in Kigali, Rwanda, while working as a member of a Yale team participating in a program funded by the Clinton Health Access Initiative. He was 68. He was born in Guyana on September 24, 1944, and after graduation from high school he worked as a math teacher for two years and then moved to the United States. After earning a laboratory technician degree, he joined the U.S. Army and served as section chief of microbiology and parasitology in Heidelberg, West Germany. Henry graduated from Central Connecticut State University with a bachelor's degree in biology and later earned a medical degree from the University of Connecticut. He completed his residency and chief residency in internal medicine at Saint Mary's Hospital in Waterbury, Conn. He held appointments as assistant clinical professor of medicine at both the University of Connecticut and Yale. Henry remained at Saint Mary's Hospital as medical director of the Family Health Center before retiring in 2010.

**Barbara L. Holman, M.S.N. '45, M.P.H. '48, Ph.D. '55**, died on January 4 in Irvine, Calif., at the age of 90. She graduated from Bryn Mawr College in 1942 and was an Army

nurse who cared for quadriplegic soldiers and a researcher at Columbia University before moving to Stanford, Calif., with her husband in 1960. She continued her research while raising her children. In 1970 she co-authored an article demonstrating that racial discrimination and work stress contribute to racial disparities in mortality, foreshadowing current research on health disparities, occupational health and stress-related disease. Barbara was known for her quiet generosity, adherence to principle in the face of adversity and her deeply held belief that all people are equal and deserving of respect, regardless of class, race, ethnicity, religion or sexuality. She passionately supported the Civil Rights and anti-Vietnam War movements and gay rights.

**William L. Kissick, M.D. '57, M.P.H. '59, Dr.P.H. '61**, died in Denver, Colo., on June 30 at the age of 80. He served in the U.S. Public Health Service under presidents John F. Kennedy and Lyndon B. Johnson and was one of two physicians who drafted the Medicare Act in 1965. Later, he was the George Seckel Pepper Professor of Public Health and Preventive Medicine at the University of Pennsylvania School of Medicine. A 1953 graduate of Yale College, William was a lifelong Yale supporter, serving as a fellow of the Yale Corporation from 1987 to 1993. For his distinguished service to the university, William was awarded the Yale Medal in 1996. He was honored by the Association of Yale Alumni in Public Health with its Distinguished Alumni Award in 1992 and named to its Alumni Public Service Honor Roll in 2001.

**Roberta (Bobbie) Lawrence, M.P.H. '74**, of New Haven and Sherman Oaks, Calif., died in her sleep on January 19 at the age of 91. A graduate of Vassar College and past president of the New Haven Vassar Club, she went back to school at the age of 50 to study public health at Yale. After working as a staff scientist at YSPH, she was appointed associate research scientist in therapeutic radiology in 1984. From 1984 to 1989, she served as director of the Tumor Registry at Yale-New Haven Hospital, where she researched survival statistics for women's cancer. Roberta is survived by her husband of 70 years, William Lawrence, D.D.S., associate clinical professor emeritus at the Yale School of Medicine and former head of the Yale Dental Department.

**Henrietta (Rita) Nash Paine, M.P.H. '43**, died peacefully on March 30 in Midlothian, Va. She attended the Potomac and Madeira Schools in Washington, D.C., and Miss Hall's School in Pittsfield, Mass. A 1941 graduate of Vassar College, she majored in bacteriology and was inducted into Phi Beta Kappa. In December 1942, while a graduate student at Yale, she married John B. Paine Jr., a Boston-based investment counsel headed for French Morocco as a lieutenant in the U.S. Naval Reserve a year after Pearl Harbor. She volunteered as a nurse's aide during the war; was a member of the National Committee for a Sane Nuclear Policy, Voice of Women and Women Strike for Peace; and served on the national board of the Women's International League for Peace and Freedom.

**Raymond J. Reynolds, M.P.H. '52**, died on February 10 in Wilmington, Del., at the age of 89. He received B.S. and B.A. degrees from the University of West Virginia. He had a long career in hospital administration and was married for 56 years to Martha B. Reiniger, who predeceased him. Raymond was a member of the Phi Delta Theta fraternity and a lifelong member of the Rotary Club. He enjoyed good wine and collected porcelain birds.

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



## Battling HIV/AIDS in 1990

New Haven-area activists and educators in the early fight against the HIV/AIDS epidemic stand in front of the city's first needle exchange program (NEP) van circa 1990. At the time, the proposal to provide drug users with clean needles was extremely controversial, but proponents countered that the public health intervention would save lives. They eventually prevailed and other cities followed New Haven's lead. The van service is still used today.

Pictured from left to right are Edwin C. Cadman, former chair of internal medicine at the Yale School of Medicine and chief of staff at Yale-New Haven Hospital; Elaine O'Keefe, M.S., who managed NEP and is now a lecturer at the Yale School of Public Health and executive director of the Center for Interdisciplinary Research on AIDS at Yale; Edward H. Kaplan, now a professor at the Yale School of Management who conducted an evaluation of NEP; George Edwards and Dominick Maldonado, both NEP staff members; Robert Heimer, M.Sc. '80, Ph.D. '88, member of the NEP evaluation team and now a professor at YSPH; Chris Brewer and Sonia Lugo, both NEP staff members; Kaveh Khoshnood, M.P.H. '89, Ph.D. '95, member of the NEP evaluation team and now an associate professor at YSPH; and Alvin Novick (now deceased), chair of the New Haven Mayor's Task Force on AIDS, a lifelong AIDS advocate and professor of biology at Yale College.

*Michael Greenwood*



## Prioritizing HIV/AIDS research in 2013

HIV experts with a range of specialties convened at the Yale School of Public Health in June to address the critical public health, ethical and legal issues surrounding the criminalization of HIV exposure and transmission.

During a two-day conference, some 20 policymakers, advocates, lawyers, researchers and others discussed HIV exposure and criminalization, areas that need further research, and how these should be addressed.

Here, participants vote on the topics that they believe need the most attention and determine action plans with timelines to address the issues. The event was organized by the Criminalization of HIV Transmission and Exposure Working Group of the Center for Interdisciplinary Research on AIDS at Yale (CIRA).

Elaine O’Keefe, M.S. (far right), a lecturer at the Yale School of Public Health and executive director of CIRA, also appears in the photo on the opposite page with New Haven’s early needle exchange van.

*M.G.*

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## STAY INVOLVED AND CONNECTED

The School of Public Health offers a wide variety of services, information and opportunities for our alumni.

### Participate in the YSPH community

**Post a job or internship online:** Our students and your fellow alumni would make great colleagues.

**Update your contact information:** In order to keep you abreast of exciting additions and changes to our services, we need to know how to reach you.

**E-mail items for Yale Public Health magazine:** Promotions, awards, marriages and new additions—we love to brag about our alumni.

**Interview prospective students:** Help us find the best and brightest both for YSPH and for the future of public health.

**Make a gift:** Supporting scholarships, programs and activities is a concrete way of furthering YSPH's mission.

**Participate in speaker series:** Your careers span the breadth of public health disciplines—students love to hear about your experiences.

**Attend events and reunions:** Come socialize, network and have fun! We love to catch up.

**Wear YSPH logo merchandise:** You earned it—wear it with pride.

For additional information on these and other opportunities, visit [publichealth.yale.edu/alumni/services/index.aspx](http://publichealth.yale.edu/alumni/services/index.aspx).

# Yale School of Public Health

