

Yale Public Health

A painting of a woman in a white dress standing in a landscape with trees. The woman is the central figure, wearing a simple white dress and looking slightly to her right. The background features several trees with sparse foliage, suggesting a late autumn or winter setting. The overall color palette is muted, with earthy tones of brown, green, and grey.

SPRING 2013

Toward a healthier future for women

Indoor tanning | Circadian clocks | Preventing violence

A new tick disease | Rating health

Yale SCHOOL OF PUBLIC HEALTH





Public Health

SPRING 2013

2 **Dean's Message**

3 **Letters to the Editor**

4 **Advances**

7 **Perspective**

10 **Trends in women's health**

12 **Unhealthy complexions**

New research reveals that indoor tanning is driving an increase in skin cancer and that young women are paying the price.

18 **Circadian disruptions**

Continuous disruptions to biological patterns may trigger the onset of breast cancer and, possibly, many other diseases.

24 **Gender conflict**

A YSPH researcher works around the world to find solutions to the violence and abuse women suffer from their male partners.

28 **Women and HIV**

The story of women and HIV in the United States is really a story about racial and ethnic health disparities.

30 **A conversation with Reshma Trasi**

32 **A new tick disease**

33 **Students**

35 **Alumni**

38 **YSPH Notes**

55 **In Memoriam**

56 **Yesterday**

57 **Today**



Dean's Message

Advancing women's health

People frequently ask whether it is necessary or appropriate to focus on a specific group when doing health care research. For example, in the recent congressional debate over the reauthorization of the Violence Against Women Act, some people questioned whether instead of a bill that focuses on the special needs of women, we as a society should create policies that better address all victims of violence.

Certainly, women and men share many health challenges, and there is a need to improve prevention and treatment efforts in many areas for all individuals, regardless of gender. But men and women do experience different health issues and they require distinct research and different policy initiatives.

Women generally live longer than men because of both biological and behavioral advantages. Nevertheless, women's health is often negatively affected by social circumstances, such as their status and the way they are treated, which can have direct or indirect negative effects on their health. For example, although men experience intimate partner violence, it is much more commonly experienced by women and, as the article in this issue on Professor Jhumka Gupta's research shows, the antecedents of, and responses to, intimate partner violence vary widely across cultures. In some settings, women's biological advantage is offset by gender-based discrimination that results in female life expectancy at birth being lower than or equal to that of males.

Furthermore, although women tend to live longer than men, they often experience more illness. And even when men and women face the same

health issues, they may be affected differently. Finally, in many cultures there are gender-based inequalities in what many consider to be the fundamental variables affecting health: education, employment and income.

In spite of the many ways in which the health issues faced by men and women differ, it is only recently that many women's health issues have received adequate attention. Historically, women were not included in clinical trials. Many argued that clinical trials with men would yield evidence that was applicable to women, and investigators were concerned about liability related to the possibility of women being pregnant, as well as the potentially confounding effects of hormonal changes. Recognizing that the underrepresentation of women in research was unjustified and had resulted in many gaps in knowledge, in the early 1990s Congress passed legislation requiring that women be included in federally funded studies unless there was compelling evidence to justify excluding them. Health and medical research have not been the same since, and we have learned how incredibly complex the relationships between gender and health are.

This issue of *Yale Public Health* presents several articles about our researchers who are learning more about the unique health challenges that women face and exploring ways to ameliorate those threats to women's health.

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

“ Finally, in many cultures there are gender-based inequalities in what many consider to be the fundamental variables affecting health: education, employment and income. ”

Letters to the Editor

Lives in public health



Yale Public Health

The Journal of the Yale School of Public Health
Spring 2013, Vol. 5, No. 1

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
Web: publichealth.yale.edu

Yale Public Health is published twice a year and is distributed to alumni, faculty, students and friends of the Yale School of Public Health.

Acronyms used in *Yale Public Health* include YSPH for Yale School of Public Health and LEPH for Laboratory of Epidemiology and Public Health (the school's main building).

Cover art by Michael Woloschinow

Printer

Pyne-Davidson Co.



Printed on recycled paper
with soy-based inks

Follow the Yale School of Public Health on Facebook, Twitter, LinkedIn and Pinterest.



A digital archive of *Yale Public Health* is available at publichealth.yale.edu/news/magazine/index.aspx.

Thank you for the Fall 2012 issue of *Yale Public Health!*

It opened so many windows into the depth and diversity of the practice of public health. The vignettes highlighted the texture and very human facets of the jewel of enlightenment that we all share in shining our light for the public, and for health, in public health.

This issue showcases images that will open minds and hearts to the possibilities that arise when we walk in another's shoes and see ourselves in others and others in ourselves. The affirmation of people and health is a meaningful and worthy pursuit, and the issue helped show it "in all its many-splendored suits."

I like Mother Teresa's line that she tried to serve whoever was in front of her as a manifestation of God, in all his infinite and surprising disguises. I see in this issue that so many in public health are indeed looking, and often where no one has trod before, to serve the higher godliness of simple goodness, relieving suffering and promoting kindness and relationship.

I thank you again for including me but much more for the many others in this issue and for the multitudes seeing this copy and who will echo the message forward in their own lives and work. Ariane Kirtley's pictures of her work with Amman Imman (pages 28 and 29) had me in tears. What a difference to make in people's lives!

Again, I think you have shown how we harvest so many careers in public health, but what we really are developing is the soil, the connectivity and human nutrients that we know, through epidemiology, to

be so primary to life, not just physically but emotionally and environmentally.

Ongoing research shows not only that viruses are embedded in the human genome, feeding our gregariousness, but that they are, in fact, in the genetic fabric of all living things. Their most intrinsic and generic influence is to teach us to look beyond our own skins for answers (or a host). This instinct to reach out is what is most vitally viral about virality.

This issue of *Yale Public Health* does this admirably, paying and playing forward (when our work becomes play or even love!), that our highest purpose comes in the positive infectivity of helping others, and thereby ourselves, as well. I am sure it will inspire others through the beautifully illustrated as well as progressive, populist and indigenous approaches to the public and their health that you have entertained here. All that connectivity will lead to more activity.

Kudos to you and your staff for this epic issue. The best yet and a keeper indeed!

Eric Triffin, M.P.H. '86



Michael Woloschynow (3)

Biological resistance to smoking measures found

The number of smokers in the United States has generally remained stable in recent years despite concerted government efforts to curtail tobacco use. The reason? New research suggests that a person's genes play an important role in whether he or she responds to tobacco control policies.

Smoking rates dropped sharply after the Surgeon General's landmark report on the dangers of tobacco in 1964, but have plateaued during the past two decades despite increasingly stringent measures to persuade people to quit. The study found biological evidence that may explain part of the reason why some people are able to respond to anti-smoking inducements, such as higher taxes and the expansion of clean-air laws, and others are not.

"We found that for people who are genetically predisposed to tobacco addiction, higher cigarette taxes were not enough to dissuade them from smoking," said lead researcher Jason M. Fletcher, Ph.D., associate professor in the Department of Health Policy and Management.

The "gene-policy interaction" study, the first of its kind, found that variations in the nicotine receptor diminished the influence of higher taxes on multiple measures of tobacco use. Individuals with a specific genetic variant decreased their tobacco use by nearly 30 percent when faced with high tobacco taxes, while individuals with an alternative genetic variant had no response.

The findings suggest that strategies that do not rely on financial or social consequences may be needed to persuade a still-significant segment of

the population to quit. The study appeared in the journal *PLOS ONE*.

Michael Greenwood

An "untapped" opportunity for better health

The simple acts of bicycling to the office and walking to the store appear to deliver significant health benefits to adults, including a reduction in risk factors associated with cardiovascular disease.

A new study finds evidence that people who engage in modest levels of "active transportation" (classified as engaging in at least 10 minutes of continuous bicycling or walking in a typical week to get to a destination) enjoy a range of health advantages over their more sedentary peers.

Active transportation is "an untapped reservoir" of opportunity for physical activity for many U.S. adults, said the authors, Mayur M. Desai, M.P.H. '94, Ph.D. '97, associate professor in the Department of Chronic Disease Epidemiology at YSPH, and Gregg L. Furie, a graduate of the Robert Wood Johnson Foundation Clinical Scholars Program at Yale.

Previous studies demonstrating a link between levels of physical activity and health outcomes have tended to focus on the effects of leisure time physical activity. This study provides evidence that a regular regimen of walking or bicycling for transportation may also slow, or prevent, the onset of several chronic diseases, which could lead to reduced health care costs. The findings also suggest that architects and zoning officials should consider

and encourage active transportation when developing new residential and commercial areas.

Individuals who engaged in a high level of active transportation (defined as 150 or more minutes per week) were approximately 30 percent less likely to have high blood pressure, and a similar reduction was seen for diabetes. The study appeared in the *American Journal of Preventive Medicine*.

M.G.



Genetic variants associated with childhood asthma

A comprehensive sequencing study of the protein-coding regions of the genome in a family with both asthmatic and nonasthmatic members has identified several variants that may contribute to the potentially debilitating condition.

Scientists at the School of Public Health's Center for Perinatal, Pediatric and Environmental Epidemiology used a technique that sequenced a fraction of the genome that codes for proteins and identified tens of

thousands of variants in each subject's genome. To understand if there were genetic variants found only within this family that contributed to asthma, the investigators focused on novel variants not present in databases containing sequencing data compiled from more than 1,000 subjects, leaving them with hundreds of family-specific variants.

These variants were then examined to see which ones tracked with asthma in this family, and 10 tracked perfectly. Of these, three genes—*PDE4DIP*, *CBLB* and *KALRN*—are of significant interest for asthma.

The research seeks to determine the extent to which the well-documented increased risk of asthma for children of asthmatic mothers is due to genetic factors and how much is due to factors occurring in the intrauterine and perinatal periods. While the study does not provide definitive proof that any of these variants contribute to asthma, the work suggests that careful filtering of variants can provide genes for further investigation. The study appeared in the journal *BMC Medical Genetics*.

M.G.

BMI, inactivity linked to cancer survival

A high body mass index (BMI) and physical inactivity are associated with more than a twofold increase in risk for mortality among women with endometrial cancer.

While BMI and physical inactivity have previously been linked with the development of endometrial cancer, the associations with cancer survival have not been fully researched.

The researchers investigated BMI and physical activity in relation to five- and 10-year survival among 1,400

women diagnosed with endometrial cancer, which affects the lining of the uterus.



Compared to women with a BMI ranging from 18.5 to 24.9 (a range which is considered healthy), those with a BMI greater than or equal to 25 were 2.35 times more likely to die within five years of diagnosis. The risk decreased slightly for women with lower BMIs. The study also found that regardless of BMI, women who engaged in more than seven hours per week of moderate to vigorous physical activity before diagnosis had an approximately 36 percent reduction in five-year mortality rates compared to women who never or rarely exercised.

“This study provides new evidence that a healthy body mass index and higher physical activity levels are associated with better endometrial cancer survival,” said lead researcher Hannah Arem, a School of Public Health doctoral candidate and a predoctoral research fellow at the National Cancer Institute.

Endometrial cancer rates in the United States are increasing, and women surviving endometrial cancer make up the second-largest group of

female cancer survivors. The study appeared in the *Journal of the National Cancer Institute*.

M.G.

Positive view of aging found to aid recovery

Older people who embrace positive stereotypes about aging are more likely than their peers with negative age stereotypes to recover after suffering from disability.

Lead researcher Becca R. Levy and Yale colleagues showed that, of two groups with differing views of aging, the individuals in the positive age stereotype group were 44 percent more likely to recover from a severe disability. Participants included 598 individuals who were at least 70 years old and free of disability at the start of the study. They were selected from a health plan in greater New Haven.

The association between positive age stereotypes and recovery from disability in older persons has not been previously studied. The findings suggest that interventions to promote positive age stereotypes could extend independent living.

“This result suggests that how the old view their aging process could have an effect on how they experience it,” said Levy, Ph.D., associate professor and director of the Social and Behavioral Sciences Division. “In previous studies, we have found that older individuals with positive age stereotypes tend to show lower cardiovascular response to stress and they tend to engage in healthier activities, which may help to explain our current findings.”

Recovery from a disability was measured by the ability to perform



four activities of daily living: bathing, dressing, moving from a chair, and walking. Doing well in these activities is associated with reduced use of health care facilities and longer life expectancy. The study appeared in *JAMA: The Journal of the American Medical Association*.

Michael Greenwood

Lavish gift giving imperiling health in rural China

Everyone likes to receive a present, but for some in rural China and other regions of the world, cultural norms surrounding gift exchange are contributing to widespread poverty and appear to play a role in poor health.

A study of pervasive scarcity in the Chinese countryside found that many people with marginal means often spend—sometimes lavishly—more than they can afford on social events, such as weddings, funerals and other public commemorations where their name and family reputation are perceived to be at stake.

The analysis, conducted by Xi Chen, Ph.D., assistant professor in the Department of Health Policy and Management, examined gift-giving practices in several rural villages and

found that many people in these tight-knit communities are driven to spend more than they can afford by peer pressure and concern for status.

Excessive gifting is pronounced enough that in some cases it comes at the expense of being able to provide basic nutrition and other health needs for immediate family members. This, in turn, forces families to get by with less, including pregnant women who then give birth to a child who is affected developmentally.

Poorer families in rural China, in many cases, spend a higher proportion of their resources on gifts than do their wealthy counterparts. Despite a growing and even robust economy that has improved the standard of living for many Chinese, many people in rural regions continue to struggle to meet their basic needs.

M.G.

Smoking bans reduce alcohol consumption

Bans on smoking in bars and restaurants not only stem tobacco-related illnesses, but they may also reduce alcohol abuse, new research suggests.

Problem drinkers living in states that have enacted smoking bans in public places had a higher rate of remission than problem drinkers living in states without such bans.

Researchers from the Yale schools of medicine and public health looked at data from the National Epidemiologic Survey on Alcohol and Related Conditions and compared remission rates of individuals with alcohol use disorder (AUD) in states that enacted smoking bans during the study period with those in states without such

bans. The study showed that smoking bans influenced rates of AUD among drinkers who drank in public places, like a bar, at least once per month.

In states without smoking bans, half of those with AUD experienced remission. The rate of remission in states with such bans increased to 61 percent. Twenty-nine states currently have enacted bans.

States with public bans also had a lower rate of new cases of AUD—7 percent versus 11 percent in states without bans. These changes seemed to be most pronounced among men and young people, as well as smokers.

One of the study's authors, Jody L. Sindelar, Ph.D., professor in the Department of Health Policy and Management at YSPH, said that since smoking and drinking are considered to be complements, if it becomes more difficult to smoke it is likely that alcohol consumption will decline. The study appeared in the journal *Drug and Alcohol Dependence*.

M.G.

Perspective

Toward a healthier future for women

Many areas in women's health require attention. Experts from Yale and beyond discuss some of the priorities.

Early screening and breast cancer detection

Thanks to increased visibility and awareness, breast cancer survival rates are higher than ever. When breast cancer is caught in its earliest stages, the five-year survival rate is over 98 percent. In spite of such progress, a recent study conducted by Komen Connecticut revealed high breast cancer mortality and high late-stage diagnosis rates across the state, including in the suburban towns of West Hartford, Glastonbury, Westport and Norwalk. These findings were surprising, as the majority of residents in these towns are well-educated and have health insurance.

To learn more about the factors contributing to these findings, Komen Connecticut conducted interviews with breast health service providers and women diagnosed with late-stage (stage III or stage IV) breast cancer. The providers agreed that the full schedules and busy lives of the women they see often take precedence over breast self-awareness and routine mammography. Providers described women as being too busy to schedule health screenings unless symptoms became disruptive to their work or daily routine. Many women interviewed echoed these sentiments, admitting to delaying screening because of “full lives,” having “more pressing personal issues” and a tendency to put themselves last.

These findings reveal that there is still much work to be done all over Connecticut. The greatest risk factors for breast cancer are being female and growing older. At this point, we cannot prevent women from getting breast cancer, nor can we predict who amongst us will develop it. Early detection saves lives, and right now, our best tool for early detection is screening.

Anne Morris, executive director, Susan G. Komen for the Cure Connecticut.

Breastfeeding for baby's, mother's health

The American Academy of Pediatrics recommends that all babies be breastfed exclusively for the first six months of life and, once other foods are introduced, that they continue to be breastfed until they are at least 1 year old.

This recommendation is based on the well-documented protection that breastfeeding offers children against poor health outcomes, including infectious diseases, obesity, diabetes and some cancers, as well as on the fact that breastfed infants have better-developed central nervous systems and ultimately have higher IQs than their formula-fed counterparts. However, it was not until recently that attention turned to the substantial benefits that breastfeeding also offers to women's health.

It is widely known that breastfeeding reduces the risk of postpartum hemorrhaging and promotes longer interpregnancy intervals. More recently it has been discovered that breastfeeding is likely to also protect women against the risk of developing metabolic syndrome (characterized by high waist circumference; high blood pressure; and high blood triglycerides, cholesterol and glucose levels), cardiovascular disease, type 2 diabetes and breast and ovarian cancers. Hormonal changes in the maternal body induced by breastfeeding are likely to contribute to these benefits.

Breastfeeding rates in the United States are far from optimal, because of the lack of social and health care support systems and the unethical marketing of infant formula. Breastfeeding protection, promotion and support should become a top national priority for both pediatric and maternal health.

Rafael Pérez-Escamilla, Ph.D., professor, Department of Chronic Disease Epidemiology, Yale School of Public Health, and director, Office of Public Health Practice.



Abuse, trauma need closer attention

Despite some concrete progress in recent decades, identification and acknowledgment of and access to care for women who have experienced trauma, abuse and/or violence in their lives remain inadequate.

The problem today is underreported and underestimated. Even when a prior history of abuse or trauma is identified in a primary care setting, there are limited resources to provide for follow-up or an intervention. Recent studies by the Centers for Disease Control and Prevention found that nearly 50 percent of women have experienced sexual or physical violence at some point in their lives.

The implications are enormous for the individual's physical and emotional well-being. Women who have experienced domestic violence are 80 percent more likely to have a stroke, 70 percent more likely to have heart disease and 60 percent more likely to have asthma than their peers who have not experienced such violence. The implications also extend to family members and, ultimately, to society. Healing and care are not available or affordable, especially when the problem is ignored and stigmatized and women are not able to access support for themselves or their children.

Even though various social, socioeconomic and ethnic groups may be more at risk, the problem affects all classes and races.

The agency Futures Without Violence advises that health care providers who identify domestic violence in patients' lives are better able to address the root cause of their health concerns, including chronic pain, depression, obstetric complications, STIs, poorly controlled chronic conditions and substance abuse. Together with policymakers and health care providers, we need to create a system that not only acknowledges the problem but also provides appropriate and accessible treatment resources for all women who are affected.

Katrina Clark, M.P.H. '71, executive director, Fair Haven Community Health Center.

Discrimination and health disparities

Many women experience everyday discrimination, chronic yet often subtle instances of mistreatment based on one's race/ethnicity, age or income level or for other reasons.

Accumulating evidence suggests that such discrimination may contribute to a range of health disparities experienced by women of color, including those associated with birth outcomes in the United States. In a longitudinal study of 420 young Latina and African-American women recruited from New York City, everyday discrimination during the second trimester of pregnancy was associated with lower infant birth weight. More specifically, women

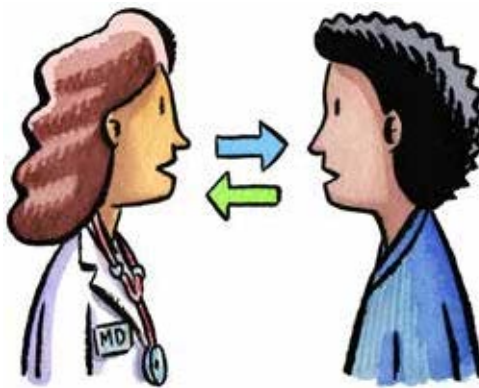
who experienced greater everyday discrimination in their second trimester reported greater depressive symptoms in their third trimester. These depressive symptoms, in turn, were related to lower infant birth weight.

The relationship between routine discrimination, depressive symptoms and infant birth weight was the same regardless of whether women identified as Latina or African-American or whether women attributed their experiences

of everyday discrimination to race/ethnicity or to something else. This work highlights the need for public health interventions to address everyday discrimination experienced by women of color.

In the short term, pregnant women of color should be screened and treated for depressive symptoms within the context of prenatal care. This may help to mitigate the impact of everyday discrimination on birth weight. In the long term, however, interventions must eliminate everyday discrimination at the sociocultural level through policy and other methods to close disparities in birth weight and other health outcomes experienced by women of color and their children.

Valerie A. Earnshaw, Ph.D., postdoctoral fellow, Center for Interdisciplinary Research on AIDS at Yale.





Addressing preterm, low birth weight

While more than 4 million women give birth each year in the United States, the rates of preterm birth and low birth weight have been intransigent for more than three decades.

Despite substantial advances in technology, drug therapies, access to prenatal care and behavioral interventions, preterm delivery and low birth weight remain leading causes of infant morbidity and mortality, and extreme racial and socioeconomic disparities persist.

The Institute of Medicine estimates that annual costs associated with this problem exceed \$26 billion. Public health measures can contribute to new evidence-based approaches that can be financially sustainable and scaled nationally to improve perinatal outcomes and reduce health care costs.

A 2011 independent review of studies of models of prenatal care found that only one randomized controlled trial demonstrated improved birth outcomes. This study, from our research team, compared an innovative model of group prenatal care to standard individual care and found that women randomized to group prenatal care had a 33 percent lower rate of preterm delivery. We have published several papers that document that all perinatal and postpartum outcomes for women randomized to group care were as good as or better than the outcomes for women receiving standard individual care.

We recently concluded another large randomized controlled trial—a translational comparative effectiveness study of group and individual prenatal care in 14 community hospitals and health centers in New York City. Initial findings indicate that women receiving group care had a lower risk of delivering a baby who was small for gestational age and had shorter neonatal intensive care unit stays.

Group prenatal care can improve birth outcomes, with implications for maternal-child health and cost savings. In partnership with the United Health Foundation, we will embark on rigorous development, implementation and evaluation to create an outcomes-focused model of group prenatal care that will be scalable nationally with an eye toward improving U.S. birth outcomes.

Jeannette Ickovics, Ph.D., professor, Department of Chronic Disease Epidemiology, and director, CARE: Community Alliance for Research and Engagement, at YSPH.

Gender-specific medicine

Consistent with scientific tradition, the first major study on the effects of estrogen on coronary heart disease risk, conducted in the 1970s, included 8,341 men—and no women. In fact, it was not until the 1990s that the National Institutes of Health, the largest funder of biomedical research, began requiring the inclusion of women as subjects in clinical trials.

Women's Health Research at Yale, now in its 15th year, has led the effort to fill in the knowledge gap left by the disparity in historical approaches to research. Yet much more investigation of women's health is needed. We have only begun to explore gender-sensitive approaches for reducing heart disease risk, smoking cessation, treating various cancers, improving diet for bone health and dealing with depression, to name a few relevant areas.

Laboratory animals, for example, are still predominately male, and this bias can compromise development of disease models and intervention paradigms that will be effective for women. Moreover, while women are now being included in clinical trials, results often are not analyzed by gender.

As we look ahead to the nation's health challenges, it is critically important to optimize care by infusing gender-specific medicine into our health care systems, taking advantage of what we know and can discover to improve the health of everyone.

As the Institute of Medicine has stated, until questions of sex and gender are “routinely asked and the results—positive or negative—are routinely reported, many opportunities to obtain a better understanding of the pathogenesis of disease and to advance human health will surely be missed.”

Our mission includes funding inventive pilot studies by building interdisciplinary research groups; engaging the community through educational outreach; and training the next generation of women's health researchers.

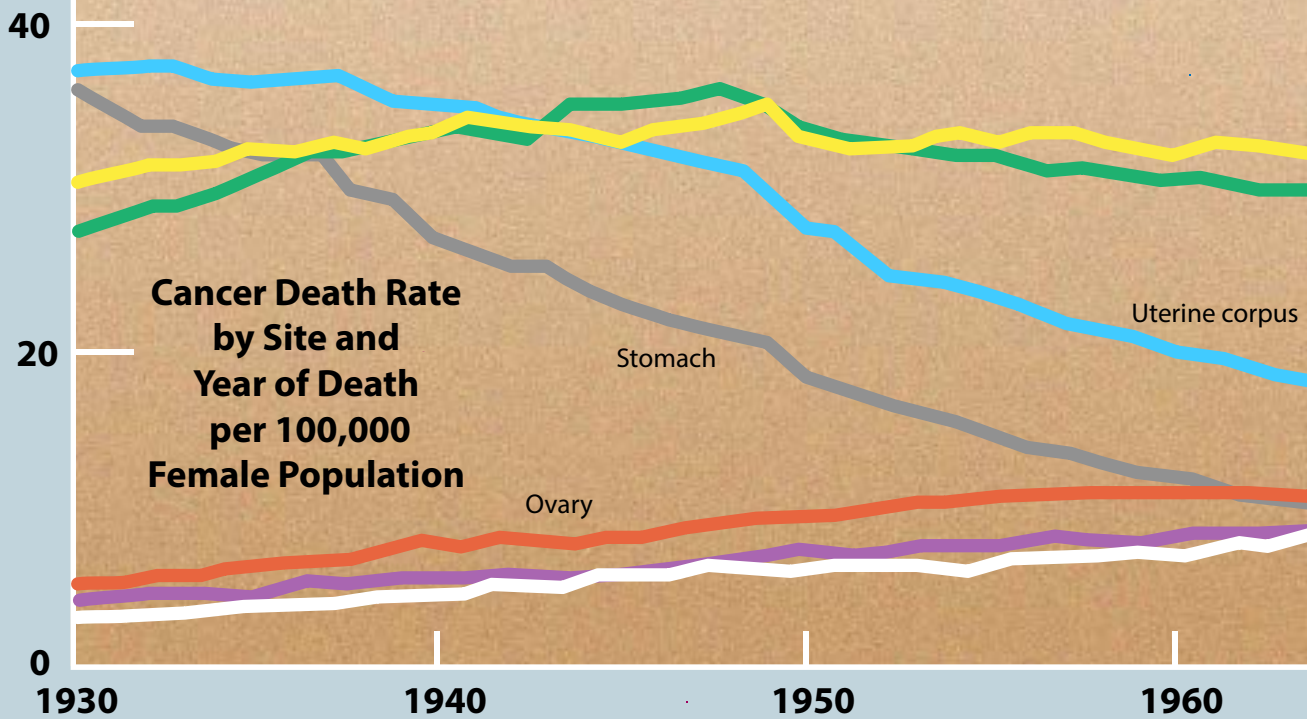
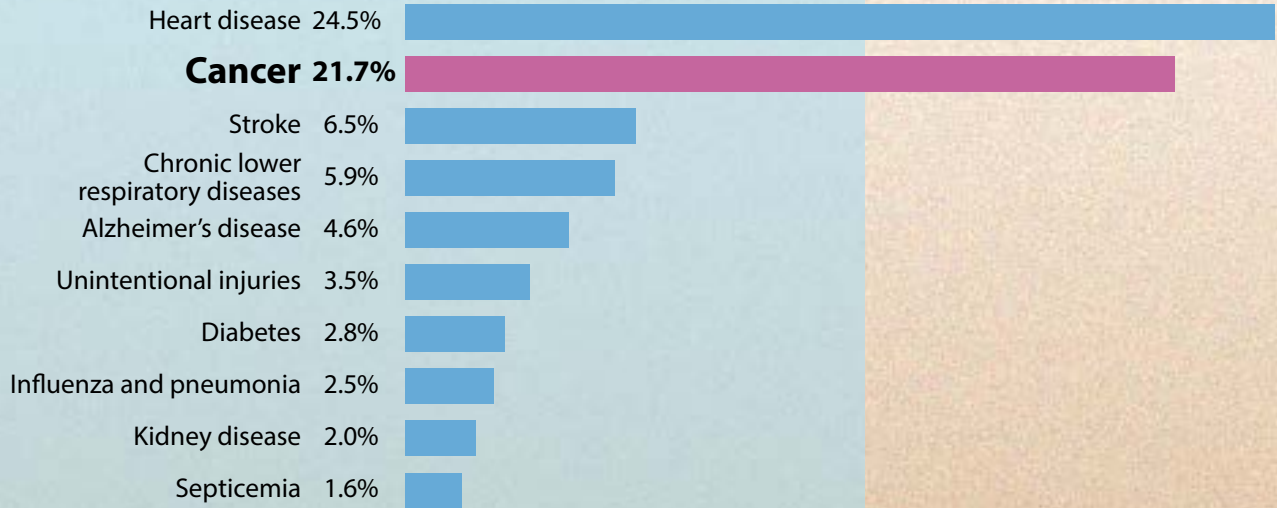
Carolyn M. Mazure, Ph.D., professor of psychiatry, and director, Women's Health Research at Yale.



Continued on page 49

AT THE END OF THE DAY

Leading Causes of Death in Women



Chronic diseases are the leading cause of death for American women. While cancer survival rates are improving, deaths from lung cancer are just starting to decline after a striking rise over 40 years.

Sources: Centers for Disease Control and Prevention, American Cancer Society

Top 10 Cancer Sites in Women 2010

Breast 28%

Lung and bronchus 14%

Colon and rectum 10%

Uterine corpus 6%

Thyroid 5%

Non-Hodgkin lymphoma 4%

Melanoma of the skin 4%

Kidney and pelvis 3%

Ovary 3%

Pancreas 3%



Research reveals that indoor tanning is driving an increase in skin cancer and that young women are paying the heaviest price.

UNHEALTHY COMPLEXIONS



Basal cell carcinoma (BCC) is the most common form of cancer. While unlikely to metastasize and therefore associated with low mortality, it can be disfiguring and costly to treat. Typically, it has been seen on the heads of elderly outdoor enthusiasts: think dockworkers, golfers or Sun Belt retirees with blotchy, scabbed facial skin.

Imagine, then, dermatologists' bewilderment a couple of decades ago when they began to see this nonmelanoma form of skin cancer in more and more young women, many still in their teens.

Several years ago, Yale dermatologist David J. Leffell, M.D., informed Susan T. Mayne, Ph.D., the C.-E.A. Winslow Professor of Epidemiology, about this development. Curious, she examined Yale's dermatopathology archives. (Due to the sheer volume of these types of cancers, they are not reportable to state registries.)

The Yale data showed that between 1990 and 2004 the number of patients under 40 with BCC had jumped. Between the first and last years, cases in men in that age group had risen by 40 percent. In women, the case number had nearly doubled. Moreover, the trends echoed other findings, like a Minnesota study that charted a similar rise in BCC in women under age 40 between 1976 and 2003.

"The fact that we saw it in females and not so much in males led us to say, 'This looks really interesting,'" Mayne recalls.

Any number of factors might account for such an increase—holes in the ozone layer, a rise in sunbathing, more-revealing fashions. But the Yale dermatologists had been questioning their patients. A great many, it turned out, were frequent users of indoor tanning.

A strong link

In a case-control study published in 2012 in the *Journal of the American Academy of Dermatology*, Mayne, Leah M. Ferrucci, Ph.D. '06, associate research scientist, and colleagues from the Yale Cancer Center and the Yale School of Medicine investigated the relationship between skin cancer and indoor tanning. They interviewed 376 non-Hispanic, Caucasian BCC patients under the age of 40 about their history of tanning indoors and compared their answers to those of a control group with benign, non-UV-related skin conditions. Unlike previous studies, which were smaller or focused on older people, a large proportion of their subjects had engaged in indoor tanning.

The researchers discovered that a history of ever having tanned indoors carried a 69 percent higher risk of early-onset BCC than that for people who had never tanned indoors.

While correlation doesn't necessarily mean causation, this study suggested several important reasons to suspect

"This is about as compelling evidence for causation as you can get in the setting of epidemiologic research."

—Susan Mayne

a causal relationship. One particularly telling finding was a dose-response relationship between indoor tanning sessions and cancer incidence. Patients who used tanning beds more often were at a higher risk of BCC. (Additionally, the association between indoor tanning and BCC in the study group was stronger in women, the group for which indoor tanning was more common.)

When considered alongside other evidence, a dose-response relationship between two factors strongly suggests that the "dosing agent" has caused the "response," rather than their being merely associated. Another supportive factor for causality was specificity: in the study subjects, a disproportionate number of BCC lesions occurred on the torso and limbs, sites of the body that receive heavy ultraviolet (UV) exposure during indoor tanning sessions but that are less likely to be exposed to regular outdoor sunlight.

And then there is biological plausibility that the exposure is related to the disease. Basic science research has long shown UV light to be a skin carcinogen. In 2006, the International Agency for Research on Cancer (IARC) evaluated the epidemiological data on indoor tanning and skin cancer and found what it called "convincing evidence" in favor of a causal link for melanoma and the second type of

nonmelanoma skin cancer (NMSC), squamous cell carcinoma. (At the time of that review there were few studies of BCC and indoor tanning.) Three years later, in 2009, IARC classified tanning devices that emit UV light as Group 1 carcinogens, in the same category as tobacco smoke, asbestos and X-rays. Then, in 2012, an updated review of the epidemiology studies on BCC and indoor tanning published in *BMJ* concluded that indoor tanning was associated with an increased risk of BCC. Many health and medical organizations, including the American Cancer Society, the American Academy of Dermatology and the U.S. Food and Drug Administration, have recommended that people avoid indoor tanning altogether.

“We have the biochemistry. We’ve got a plausible mechanism. It’s a known carcinogen,” says Mayne of UV light. “We’re just looking at it in a new exposure setting. This is about as compelling evidence for causation as you can get in the setting of epidemiologic research.”

So is there any safe way to tan indoors?

“As far as we can tell, based upon the data, there is not,” says Ferrucci. “We see an increase in both nonmelanoma skin cancers and melanoma with a history of indoor tanning. That one activity seems to be predictive of risk.”

Growing popularity

Tanning beds started arriving in the United States in the late 1970s. Since the 1980s, indoor tanning has become increasingly popular and is now estimated to be a \$5 billion business that serves about 30 million people in the United States each year, most of whom are young, non-Hispanic Caucasian women.

As indoor tanning has grown more common, so, too, has skin cancer. Between 1998 and 2008, the incidence of melanoma rose 2.1 percent per year in Caucasian men and 2.4 percent per year in Caucasian women. Increases in men were seen only in those over 55, while increases were seen in women of all ages. NMSCs, including BCC and squamous cell carcinoma, are also on the rise. One study found a 77 percent rise in NMSC treatments for Medicare beneficiaries between 1992 and 2006.

Unfortunately, many indoor tanners feel pressured to engage in the activity. For some young people, the norms of their sport or activity demand bronzed skin. These include beauty pageant contestants, dancers, synchronized swimmers,



Alaina Pritchard

Lauren Hurd began visiting indoor tanning salons when she was 17 years old, and by college she was going several times a week. At age 22 she was diagnosed with early-stage malignant melanoma on her leg. Hurd, who works at Yale University, is now 26 years old and cancer-free, but she will have to be checked for the rest of her life.

wrestlers, gymnasts and bodybuilders. “If they’re not tan, they’re viewed as not competitive,” says Mayne. “These people shouldn’t have to feel that they have to engage in these carcinogenic behaviors just to be competitive at what they love to do.”

Simply being a teenager can also suffice to get a person in the door. Lauren Hurd, 26, knows this firsthand. A blond, blue-eyed former lifeguard, she began tanning with friends at age 17 to prepare for her prom. “I was hesitant at first and knew it probably wasn’t a healthy choice, but it was a social activity and we all know at that age how heavily this can impact a decision,” she recalls. On arriving at college in upstate New York, she discovered that tanning was equally popular among her new friends, and when a spa-like salon opened up across from campus, she joined them in purchasing its \$20 unlimited monthly packages. Soon Hurd was going in for 20-minute sessions several times a week; she found tanning a reprieve from the daily pressures of college.

“Just like when you’re addicted to anything else you know is bad for you, you try to rationalize. You say to yourself, ‘It won’t happen to me. Even if I do get skin cancer, it will be way down the road.’” For Hurd, that road took only about five years. She was diagnosed at age 22 with early-stage malignant melanoma on her leg.

Mayne says she was shocked to learn of the sheer popularity of indoor tanning among the young people in her

“Just like when you’re addicted to anything else you know is bad for you, you try to rationalize. You say to yourself, ‘It won’t happen to me. Even if I do get skin cancer, it will be way down the road.’” —Lauren Hurd

study. “Amongst our females who had these early-onset skin cancers, 81 percent of them had used a tanning bed,” she says. “That’s a mind-boggling number.” In her study, more than 50 percent of indoor tanners had started this practice before the age of 17. According to national data from the 2011 Youth Risk Behavior Surveillance System, 21 percent of high school girls report having engaged in indoor tanning in the past year; this figure rises to 29 percent among non-Hispanic, Caucasian high school girls.

The pressure may be internal as well. Evidence is mounting that indoor tanning may be addictive. Many frequent tanners claim they are hooked, and the problem may be compounded by the youthfulness of the indoor tanning set—evidence from other behaviors such as drinking indicates that beginning such behaviors at early ages raises the likelihood of addiction. The phenomenon, says co-author Brenda Cartmel, Ph.D., research scientist and lecturer in the Department of Chronic Disease Epidemiology, may relate to endorphins, which are produced in the skin in response to UV exposure. One study found that people could tell with near-perfect accuracy whether their tanning bed had a UV filter. Participants reported feeling more relaxed and less tense after UV exposure.

Dangerous though it may be, indoor tanning as a risk factor is readily modifiable—unlike, say, a genetic predisposition. That makes it a tempting target for public health initiatives aimed at preventing skin cancer. Mayne and Ferrucci calculated that 43 percent of early-onset BCCs in women could be avoided if the women never tanned indoors, while an October study in *BMJ* suggested that indoor tanning could account for about 170,000 skin cancers each year in the United States alone.



A close-up of a basal cell carcinoma skin cancer being treated with topical medicine. New research finds a high correlation between indoor tanning and the onset of the nonmelanoma form of skin cancer.

Many states have enacted age-related restrictions on indoor tanning, most of which require parental permission for minors. Two states—California and Vermont—ban indoor tanning outright for people under 18, while New York bans it for those under 17. Supporters of such laws point out that children are barred from legally purchasing another known carcinogen, tobacco. In addition, says Mayne, the laws can ease peer pressure.

“If you talk to skin cancer survivors, they will tell you, ‘I started tanning because everybody was tanning,’” says Mayne. “If we’re able to restrict it, that eliminates them having to make those difficult decisions. And then when they’re 18, hopefully they’re in a little bit better position to be able to make informed choices.”

In February 2012, Connecticut considered a bill that would have made it the fourth state to ban tanning for most teens. Ferrucci and Hurd were among those testifying in its favor, but the bill died in committee. A similar measure is being considered by the legislature in 2013. Current Connecticut law allows adolescents 16 and over to tan without parental permission.

In any case, such laws don’t go far enough, says Ferrucci. In 2009, months after tanning devices landed on the Group 1 carcinogen list, Brazil outlawed cosmetic artificial tanning. “That would be potentially the ideal,” she says.

Industry opposition

Such proposals meet with strong opposition from the tanning industry. The Indoor Tanning Association (ITA), which represents tanning businesses and sunlamp manufacturers, supports parental consent laws for minors. But it has objected to other regulatory efforts. An ITA representative opposed to the Connecticut bills argued that barring minors from indoor tanning will lead them to tan outdoors or at home “in an unsupervised and reckless manner.” (Hurd recalls being told by indoor tanning staff that the activity was “safer than tanning outside.”)

“We agree that overuse and sunburning are risk factors,” says the ITA’s executive director, John Overstreet. “But the message that’s out there is a way-over-the-top message. It is aimed at destroying this industry.”

Indoor tanning, he adds, is “the same thing as the sun. You have the same risks, and you have the same benefits.”

However, many people who tan indoors report getting burned during their sessions. Among the BCC cases in

Connecticut, 28 percent reported being burned from indoor tanning and 16 percent reported four or more burns. Another study of melanoma in Minnesota found a similar figure, with 22 percent reporting a burn from indoor tanning. And the relationship between indoor tanning and increased risk of both cancers holds true even in people who did not experience burns during indoor tanning.

In particular, the industry's marketing message emphasizes the fact that tanning triggers vitamin D production. Could discouraging UV exposure in an effort to prevent skin cancer lead to a rise in vitamin D deficiency and its associated problems? One group of Norwegian researchers calculated that if people in their country were to receive more sun exposure, there might be 300 more melanoma deaths per year, but 3,000 fewer annual cancer deaths overall due to the associated increase in vitamin D levels (though the latter number was based on only one paper). They also pointed out that such exposure could offer protection against noncancerous diseases, such as multiple sclerosis and diabetes, to which vitamin D deficiency has been linked.

"This message, this constant drumbeat, scaring people about tanning and ultraviolet light exposure — there's a good chance there's a bigger underlying health problem being created," says Overstreet. "Most people are deficient in vitamin D because they hear this message. You have people scared to death of being in the sun."

But when a panel of the National Academy of Sciences convened to review vitamin D intake recommendations (the results were published in 2010), it found that there are only inadequate and inconsistent data about a relationship between vitamin D intake and cancer risk. Moreover, says Mayne, who was a member of the panel, statements about epidemic vitamin D deficiency are unfounded: In fact, only 3 percent of adults in the United States are at risk of deficiency, with another 18 percent at risk of inadequacy. "The populations in the United States that tend to have low vitamin D status are people with deeply pigmented skin," she says. "Those aren't the people who are in the tanning booths."

Adds Cartmel, "If you are deficient, you can just take a supplement, which is much safer."

As for the industry's warnings about outdoor tanning, Mayne counters that while outdoor sun exposure is an important factor for skin cancer risk, most people's lives don't allow time for regular outdoor tanning — but people can easily tan indoors several times a week. In addition, exposure to outdoor UV is inherently limited in many northern climates.

Still, could indoor tanning advocates have a point? Is it safe or healthy to get vitamin D from any amount of UV radiation?

"[Indoor tanning is] the same thing as the sun. You have the same risks, and you have the same benefits."

—John Overstreet



“Half of the people in our study started using tanning beds before the age of 17, and then, in their twenties and thirties, many are regretting that choice.” —Susan Mayne

“When we look at what people actually take in from food versus what their blood status is, it is very clear that people in the United States are getting a significant amount of vitamin D from UV,” says Mayne. “I don’t think anybody’s trying to tell people that we have to shield every single ray of UV. I think that’s unreasonable. But I think indoor tanning is a completely different ballpark, because it is an unnatural, intense exposure that has now been associated with rising rates of these cancers.”

The sun emits radiation in many wavelengths, but what reaches the earth is mostly UVA and a small amount of UVB. UVA darkens the skin immediately, while UVB causes sunburn and delayed tanning. Tanning lamps emit mostly UVA, too. Overstreet says the vast majority of sunlamps have the same spectral output as the noonday equatorial sun, while the industry website SmartTan.com estimates that most sunlamps are two to four times stronger than summer sun.

But there is evidence that they are much more intense than that. One 2002 Swiss study of tanning bed lamps found that they emit 10 to 15 times more UVA than what reaches the Earth’s surface at midday at intermediate latitudes (which receive about 70 percent of the solar energy that the equator does), a finding in accord with what individuals experience when they tan indoors. “If you’re on a beach in California for 10 minutes, [most people are] not going to develop a tan,” says Mayne. “But you go into a tanning bed, and within 10 minutes of exposure, you’re getting tan.”

Moreover, sunlamp manufacturers are tweaking the technology, offering options like UVB-rich high-speed lamps and “high-pressure/high-intensity” tanning. “People tell us that the duration of the sessions is shorter now than it used to be in the past, so obviously the bulbs are more intense than they were,” Mayne says.

In short, Mayne sees indoor tanning as a new human experiment. “We don’t have that equivalent of UV exposure in the outdoor environment.”

Next steps

Mayne and Ferrucci are not finished examining indoor tanning. With Cartmel and other colleagues, they are investigating the genetics of both skin cancer susceptibility and tanning addiction. They also want to better understand

how people’s indoor tanning behaviors change after a skin cancer diagnosis, as their other findings indicate that some 14 percent of BCC patients continue to engage in indoor tanning after their diagnosis. “We’re just trying to work out why these people are going back and still participating in a risky behavior, when they are actually at quite high risk of getting another skin cancer,” says Cartmel.

They are also studying the natural history of subsequent skin cancers in people who have already been diagnosed once at a young age. Though mostly nonfatal, these cancers cost the country a great deal in the aggregate. “As people are starting to get them younger, they have a whole lifetime to keep getting these cancers,” she says.

Ferrucci recently received a five-year grant from the American Cancer Society to study indoor tanning prevention and cessation. She is developing an online intervention to discourage women in their twenties from using tanning beds, as well as conducting focus groups with young adolescent girls to pinpoint why they might start this behavior in the first place. “One of the things that’s motivated me in doing this research is that this is a behavior that individuals can change,” Ferrucci notes.

Indeed, for Mayne, Ferrucci and Cartmel, one thing is clear: If thousands of skin cancers can be prevented by simply avoiding UV light, then public health professionals have a clear responsibility to try to make that happen.

Hurd regrets her former tanning habit and now advocates for stricter regulation. Though her melanoma was excised, she must undergo frequent cancer surveillance for the rest of her life. “I think this is a public health issue comparable to that of the Big Tobacco industry of our generation,” she says. A ban for minors “would have made an enormous difference for me had it been in place when I was 17.”

Mayne has heard such regrets over and over again. “Half of the people in our study started using tanning beds before the age of 17, and then, in their twenties and thirties, many are regretting that choice,” says Mayne. “They often say, ‘I wish somebody had told me. I wish somebody had worked toward this when I was a kid.’ It’s a completely preventable exposure.” YPH

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

the rhythm of everything. *g*uini.



Research reveals that continuous disruptions to biological patterns may trigger the onset of breast cancer and, possibly, other diseases.



By Steve Kemper

Dawn triggers basic biological changes in the waking human body. As the sun rises, so do heart rate, blood pressure and body temperature. The liver, the kidneys and many natural processes also begin shifting from idle into high gear. Then as daylight wanes and darkness descends, these processes likewise begin to subside, returning to their lowest levels again as we sleep.

These internal biological patterns are tightly linked to an external cosmic pattern: the earth's rotation around the sun once every 24 hours. This endless loop of light and darkness and the corresponding synchrony of internal and external clocks are called circadian rhythms, from "circa diem," Latin for "approximately a day." Circadian rhythms influence almost all living organisms, from bacteria to algae, insects, birds and, as is increasingly understood by science, human beings.

Researchers are learning that these endless patterns also have profound effects on human health. "Circadian rhythms regulate almost every biological process in our body, especially hormone-related processes," says Yong Zhu, Ph.D., associate professor in the Department of Environmental Health Sciences. He has traced the consequences of disrupting circadian rhythms right down to changes at the molecular level. His research is on the frontier where circadian rhythms and one's work schedule intersect with public health.

A collaboration is born

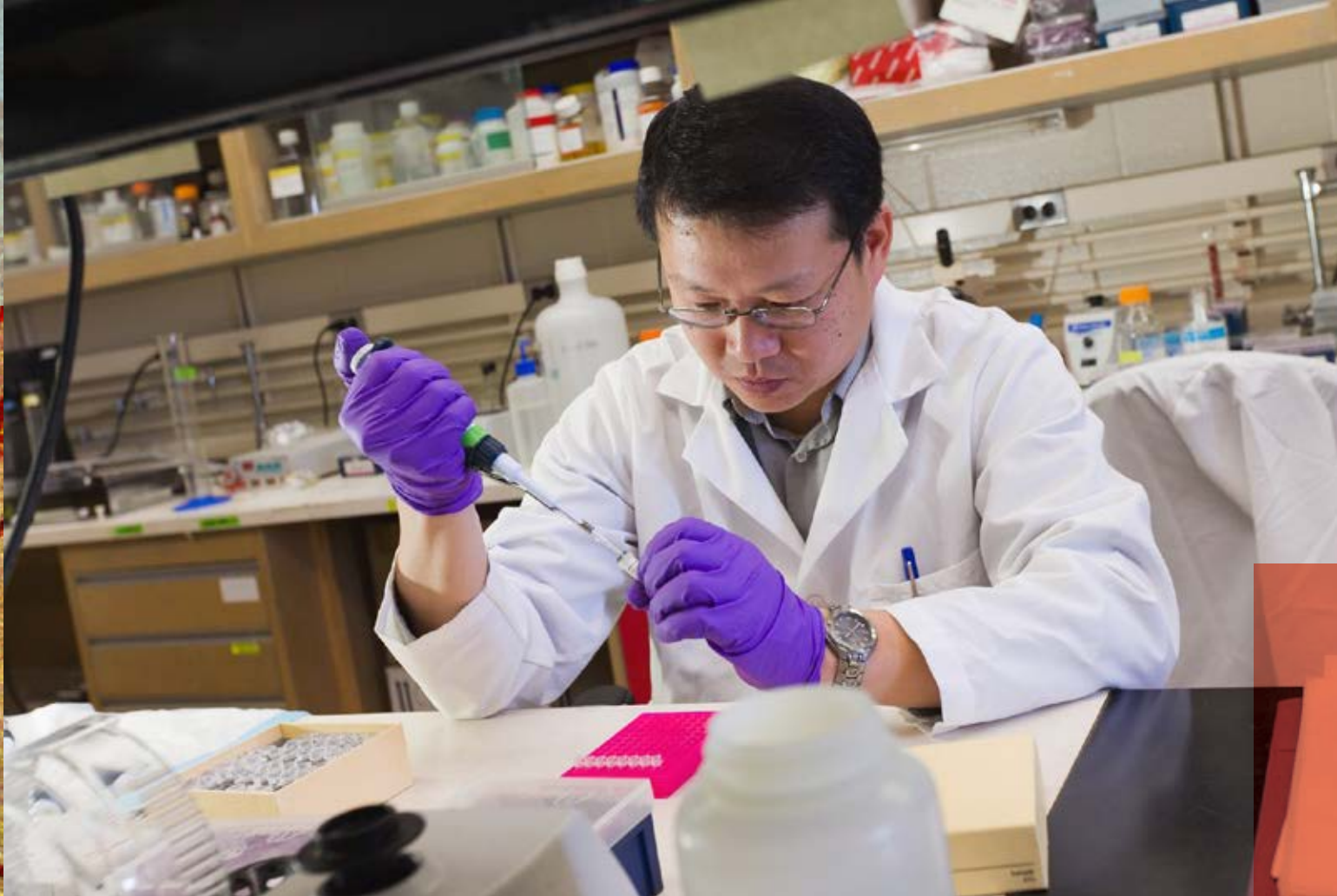
To understand Zhu's work, some background is helpful. Circadian rhythms are ancient. The pattern was established about 3 billion years ago, and life on earth evolved in accordance with it. Yet many aspects of circadian rhythms and their influences remain mysterious. Scientists partially understand how the synchrony of internal and external clocks governs such things as migrating birds, hibernating bears and the navigational sun-bearings communicated by honey bees to their hivemates. Scientists also understand some of the links between circadian rhythms and human health. These rhythms, or disturbances of them, help explain such physiological phenomena as jet lag, winter blues (seasonal affective disorder), chronic insomnia and habitual fatigue among adolescents.

But it is only in recent years that researchers have turned their attention to the long-term health effects of disrupted circadian rhythms. About 25 years ago a cancer epidemiologist at the University of Connecticut Health Center named Richard G. Stevens wondered why breast cancer rates were so high, and highest of all in industrial societies. He suggested a possible link between breast cancer and a modern invention that constantly disturbed circadian rhythms – electric lights. Following this logic, he also postulated that female night shift workers would have higher rates of cancer than female workers on the day shift.

"People thought I was nuts," Stevens, Ph.D., says today. "But this lighting of the night is new in human evolution. We figured out how to use fire probably a million and a half years ago, and we got candles about 5,000 years ago, but we weren't lighting the whole night. Electricity really changed things, with bright lights that can stay on all night. Our circadian system, which is ancient, is confused. The issue is getting a lot of attention now – things have been accumulating rapidly in the last 10 years – but it took a while."

This is where Zhu enters the picture. When he arrived at Yale a decade ago as a molecular epidemiologist, he happened to attend a lecture by Stevens at the school about the possible links between breast cancer and the circadian disruptions that result from modern life. Zhu, excited and intrigued, talked to Stevens afterward about applying his molecular expertise to Stevens' theory. "I realized that circadian rhythms probably have a tremendous impact on public health," says Zhu, "but people weren't paying enough attention." The two researchers started a collaboration that continues to this day.

"I realized that circadian rhythms probably have a tremendous impact on public health, but people weren't paying enough attention." –Yong Zhu



Yong Zhu, associate professor at the School of Public Health, works in his lab on the connection between disruptions to circadian rhythms and the onset of breast cancer and other diseases.


Several core circadian genes – sometimes called clock genes – were identified in animals in the late 1990s. Zhu and Stevens decided to explore what Zhu calls the circadian gene hypothesis. “I wondered whether we could provide genetic evidence – that’s the key issue – linking mutations in circadian-related genes to breast cancer risk.”

Growing evidence

According to Stevens, two of their recent papers, for which Zhu was lead author, have pushed Zhu to the forefront of molecular researchers in this area. The first paper appeared in *Cancer Epidemiology, Biomarkers & Prevention* in 2005. Using cases drawn mostly from Yale-New Haven Hospital, the researchers identified a structural genetic mutation in the *Period3* gene that was significantly associated with breast cancer. They further examined all 10 human circadian genes, particularly the core circadian gene called *CLOCK*, which the authors describe as “the heart of the molecular autoregulatory feedback loop,” responsible for “maintaining the circadian cycle.” These findings provided the first genetic evidence linking breast cancer with circadian genes. Zhu and his colleagues also found evidence linking mutations to prostate cancer and non-Hodgkin lymphoma.

Further, they discovered that *CLOCK* regulates many other genes, including some associated with hormone production. In other words, circadian rhythms are deeply and systemically influential at the molecular level. Researchers call regulatory genes like *CLOCK* “transcriptional activators,” which are also known as oncogenes or tumor suppressors – genes that can affect cancer development. The paper’s clear implication is that when something knocks *CLOCK* out of sync with the universal circadian rhythm, the health consequences can be grave.

“Then we went one step farther,” says Zhu. By that point, a number of studies had confirmed Stevens’ hunch about the relationship between breast cancer and disrupted circadian rhythms. Studies in Denmark, Norway and the United States had shown that women of varying occupations who worked at night for long periods – nurses, caterers, flight attendants and others – had higher rates of breast cancer. Women who worked irregular rotating shifts suffered the highest rates, probably because their circadian rhythms were maximally disrupted. “Taking all studies into account,” says Zhu, “the consensus is about a 50 percent increased risk of breast cancer.” (In a fascinating corollary study, Stevens and others found that visually impaired



“It’s a small study that has to be replicated, but if it turns out to be true, it’s absolutely dynamite, because then we have an environmental connection to heritable changes in the expression of genes.” —Richard Stevens

women had a lower risk of breast cancer, with the lowest risk among blind women. “They don’t perceive light at night,” says Stevens, “so their circadian rhythm is robust.”)

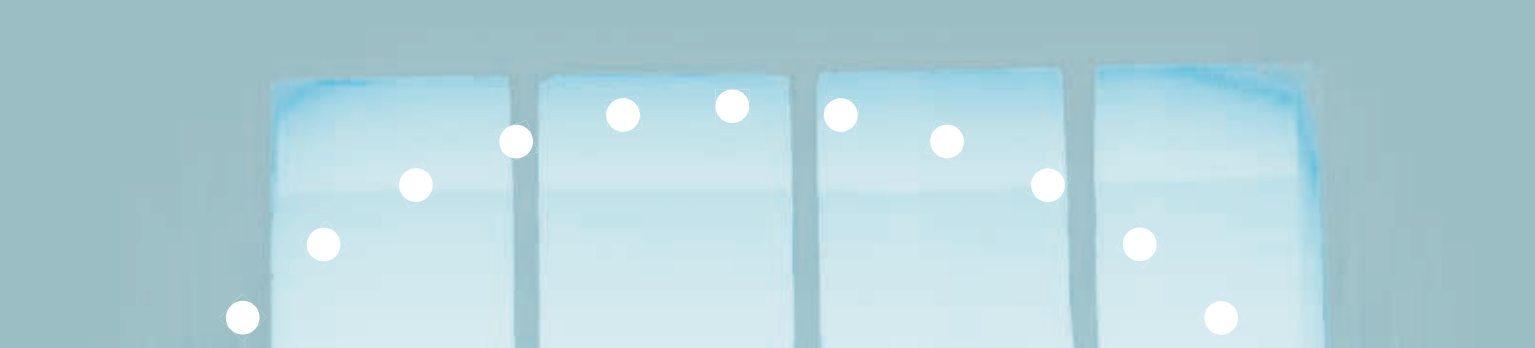

By 2007, the link between breast cancer and night shift work was so well-accepted that a panel of experts assembled that year by the International Agency for Research on Cancer concluded that “shift work involving circadian disruption is probably carcinogenic to humans.” The biological causes, however, remained unknown.

“So we asked the question,” says Zhu, “what exactly happens at the molecular level?” Using data from a landmark Danish study of female shift workers, Zhu and colleagues discovered the missing molecular link: in women who worked at night for at least 10 years and had breast cancer, the disruption of their circadian rhythms was detectable at the level of DNA, in epigenetic changes – that is, genetic changes caused by external influences. This breakthrough was published in 2011 in *Chronobiology International*.

“It’s a small study that has to be replicated,” says Stevens, “but if it turns out to be true, it’s absolutely dynamite, because then we have an environmental connection to heritable changes in the expression of genes.”

The exact nature of the biological mechanism, however, remains unclear. That’s Zhu’s next target. He suspects that the disruption of circadian rhythms caused by night shift work suppresses the production of melatonin. Darkness triggers the release of this crucial hormone, which in turn signals certain biological processes to decelerate and helps us to sleep. Some research has suggested that when melatonin is suppressed, estrogen levels jump – a known cause of breast cancer. Women who work at night under bright lights are habitually blocking the production of melatonin and perhaps increasing their risk of breast cancer. The obverse may also be true: melatonin has been shown to suppress mammary tumors in rodents. In his cell line work, Zhu has found that adding melatonin to cells helps them resist cancer and reduce its damage.

Worldwide, an estimated 15 percent to 20 percent of the female labor force works at night, but Zhu points out that many of these women probably are not susceptible to the risk factors he has studied, just as many smokers don’t develop lung cancer. No one knows how much disruption of circadian rhythms is necessary to bring on problems; Zhu believes that this varies from person to person. He also expects the future to bring genetic tests that identify people



who are biologically vulnerable to disruptions of their circadian rhythms.

In the last 30 years, the incidence of breast cancer in the United States has risen from 100 to about 135 per 100,000, according to the U.S. National Cancer Institute's SEER database. Disruption of circadian rhythms is one of many possible risk factors, but how large a role it plays remains unclear, partly because researchers don't yet know all the ways that circadian genes interact and combine with other risk factors. "For example," says Zhu, "premenopausal women who carry certain genetic mutations in a circadian gene are more likely to develop breast cancer, and some genetic associations between circadian genes and breast cancer risk have been detected among women with a particular ER/PR [estrogen receptor/progesterone receptor] status."

Future directions

The group at risk from circadian disruption includes males as well as females, across many occupations – police officers, airline pilots, firefighters, factory workers, business people who frequently cross many time zones and others. And the potential health risks extend far beyond breast cancer. Zhu's work, for instance, has implicated circadian rhythms in prostate cancer. Weaker evidence links circadian disruption to ovarian and colon cancers. Zhu expects this list of cancers to grow, especially hormone-related cancers. Research also has linked disturbed circadian rhythms to obesity, diabetes and chronic inflammatory diseases. That list, too, is likely to lengthen as scientists continue to unlock the mechanisms of circadian genes.

Zhu intends to be one of the lock pickers. He plans to replicate his results in bigger studies and to corroborate epigenetic changes among people who work at night or flout circadian rhythms by not getting enough sleep. "DNA repair gets triggered during sleep and works to fix all the

genetic damage that happens during the day," he points out. Unrepaired cells are at greater risk of cancerous changes. Similarly, circadian genes are directly engaged in regulating cell division, much of which occurs during evening or nighttime hours – probably because ultraviolet light can cause mutations and cells are more susceptible to mutation while dividing. All this means that people who work at night or have erratic sleep patterns may be more vulnerable to attack from cancer and other health problems.

Zhu hopes to collaborate on a new project soon with Mary A. Carskadon, Ph.D., director of Chronobiology and Sleep Research at Bradley Hospital in Riverside, R.I., and professor of psychiatry and human behavior at Brown University. Carskadon is a pioneering researcher on sleep and circadian rhythms in children and adolescents. Last spring while visiting Yale to lecture, she had a conversation with Zhu about his new epigenetic work. "In 20 minutes he taught me a huge amount," she says, "and he made one comment out of the blue that was so inspirational it changed one of my projects." The two now hope to collaborate on research about epigenetic phenomena.

"Basically his point was that, yes, you have a genetic background," says Carskadon, "but do experience and environment change your genes in a way that might either mitigate or accentuate your response to that environment? There have been epidemiological signals about shift work and cancer, but Yong has taken it to the next level with his work on *CLOCK* genes and epigenetics. It gives us a sense of the next steps to take, because it's fundamental research that could lead to clinical interventions by identifying people at greater risk."

Researchers are also looking for ways to work with circadian rhythms to improve health. Some medications, for instance, are more effective if given at certain points in the circadian cycle. Heart attacks and strokes are more common



“We mess with these things at our peril.” —Mary Carskadon

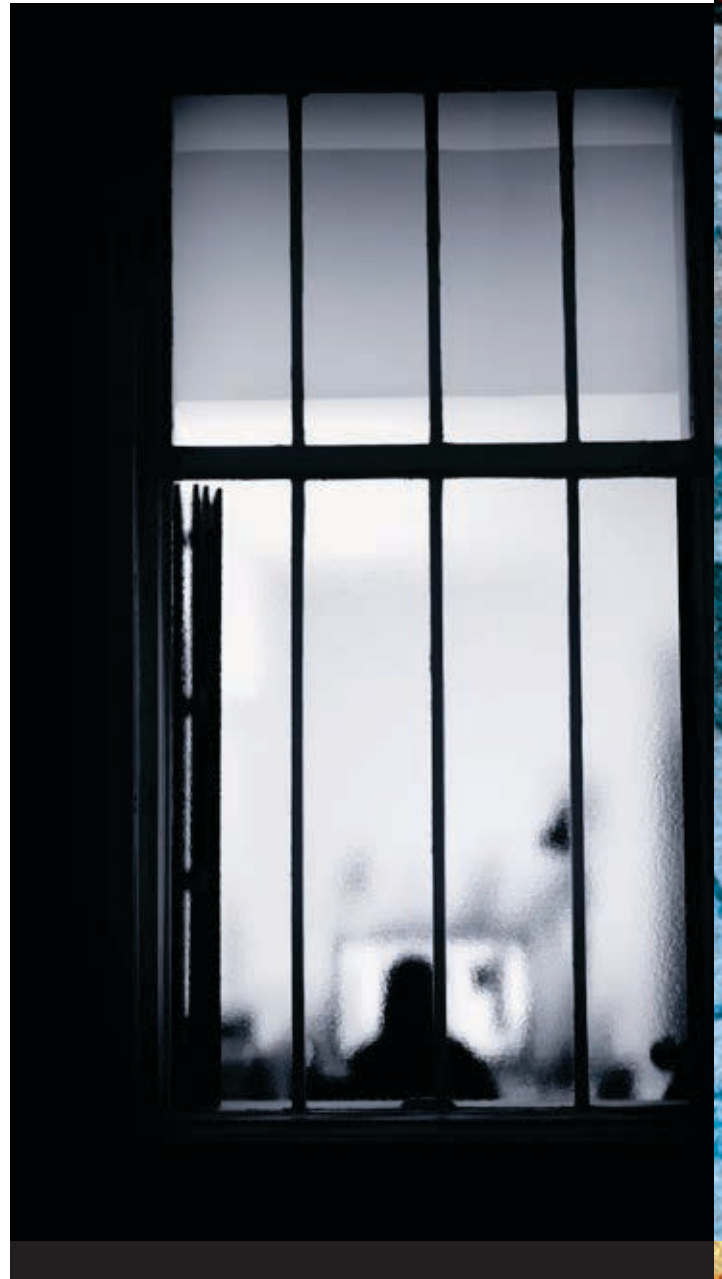
early in the morning, when heart rate and blood pressure increase to meet the day. That’s why blood pressure medication should be taken first thing in the morning. Conversely, asthma attacks are most common at night, so preventive medication works best before sleep. Preliminary research suggests that some cancer chemotherapies are significantly more effective and cause fewer side effects when given at the optimal time of day.

Much of this remains experimental and outside of mainstream health care, though that is slowly changing, thanks to researchers such as Zhu, Stevens and Carskadon. Last June the American Medical Association adopted recommendations about the adverse health effects of nighttime lighting, based on a report by Stevens. In January of this year the Centers for Disease Control and Prevention issued a warning about the health risks associated with sleepy drivers, specifically night shift workers and people who don’t get enough rest because of lifestyle or sleep disorders. Such people, said the CDC, are less attentive, slower to react and more likely to make poor decisions – consequences of ignoring circadian rhythms. These potential effects have led some medical schools, including Yale’s, to alter the long hours and rotating shifts typically worked by medical residents.

“Circadian rhythms and sleep are central components of our biological systems,” says Carskadon. “This is part of how life has been regulated forever. And yet we fly around the globe or work around the clock and ignore these signals. But we mess with these things at our peril. The implications span all of public health, from tumors to automobile accidents.”

Zhu puts it more simply. “Every single species on earth evolved and adapted to this cycle,” he says. “Any changes in it will impact our bodies.” [YPH](#)

Steve Kemper is a freelance writer in West Hartford, Conn.



Growing evidence suggests that working irregular hours over a long period of time may affect a core circadian gene called *CLOCK*. Changes to this gene may have a number of health consequences.



*gender
conflict*

A researcher at the School of Public Health has worked around the world to find solutions to the violence that women experience at the hands of their male partners.

By Valerie Finholm

In West Africa's Ivory Coast (Côte d'Ivoire), as many as 60 percent of women experience physical or sexual violence at the hands of their male partners at some point in their lifetime.

The statistic is stunning but does not fully convey all of the immediate and deferred public health issues that arise when women become the victims of violence inside their homes or within their relationships.

The challenge for public health practitioners is how to address—and meaningfully reduce—the incidence of such violence in countries and cultures around the world where poverty, cultural attitudes surrounding gender and, frequently, external political violence or warfare contribute to an environment that is perilous for women, even within the confines of home and family.

“Intimate partner violence is a huge public health issue” in Ivory Coast—and worldwide, says Jhumka Gupta, M.P.H., Sc.D., assistant professor in the Department of Chronic Disease Epidemiology. A social epidemiologist, she has studied the far-reaching health implications of intimate partner violence (IPV) among inner-city residents, refugees and immigrants in the United States and among populations in countries as diverse as Bangladesh, Colombia, Haiti and Nepal.

Globally, anywhere from 15 percent to 75 percent of women experience physical or sexual IPV at some point in their lifetime, according to the World Health Organization. In the United States, despite numerous laws and services in place to protect women, the number is as high as 25 percent, the National Violence Against Women Survey has found.

Health and IPV

Gupta recently completed an evaluation of a two-year program aimed at reducing IPV against women in Ivory Coast's rural villages that have been impacted by war and conflict.

The challenges are enormous. Very little research has been done on IPV in such settings, and evidence suggests that it is an issue that is often overshadowed by other, more pressing needs.

“In those kinds of settings IPV is very much neglected and is not a high-enough priority, since other important public health issues tend to be the focus,” Gupta says. “If gender-based violence against women is addressed, it generally focuses on sexual violence perpetrated by armed groups, with little attention to the violence a woman faces

from her partner. I'm not trying to minimize violence by armed groups, but IPV is a chronic issue. It happens before a war, during a war and after a war. And it occurs inside a woman's home or inside what is perceived as protected space. So the [public health] needs of women experiencing IPV aren't getting addressed.”

Prior to her academic research career, Gupta worked for women's health programs in regions affected by conflict, including Haiti. She saw the horror of IPV firsthand—women who ended up in the hospital with knife or machete wounds inflicted by their husbands.

“Intimate partner violence is deeply rooted in cultural norms and gender inequalities that disfavor women.”

~ Jhumka Gupta

“IPV is deeply rooted in cultural norms and gender inequalities that disfavor women,” she says. “In areas impacted by conflict, you also have a breakdown in infrastructure, lack of services and laws, economic disruption and trauma, all of which can contribute to IPV in these settings.” Additionally, Gupta's prior research has shown that men who experience political violence are more likely to be violent against women later in life.

These factors, compounded by a tendency of funding agencies and governments to overlook IPV in conflict-affected settings, contribute to an environment where silence around IPV is encouraged and it is difficult to fully address the health needs of women, Gupta says. “There are obvious health consequences, such as injury and death—but IPV is also linked to a whole host of other public health consequences, such as HIV/AIDS, because a woman cannot control her sexual relations with her partner, cannot say ‘no’ and cannot demand protection, so she's going to be vulnerable to HIV. There is a greater risk of unwanted pregnancies, poor birth outcomes and poor mental health.”

Gupta says that the health impacts of IPV may be more detrimental than the exposure to war-related violence. Preliminary analyses from Gupta's Ivory Coast study suggest that IPV is a greater predictor of poor mental health among women than exposure to war-related threats, injury and sexual violence.

Existing evidence also suggests that initiatives that empower women economically, combined with programs that challenge gender inequalities and prevailing notions of masculinity, lead to a decrease in levels of IPV, Gupta says. But the application of this research to areas of conflict is just beginning. Gupta's latest project is the result of a partnership with the International Rescue Committee



Linda Helton

Above: The School of Public Health’s Jhumka Gupta has traveled to different areas of Ivory Coast to develop public health interventions to reduce the incidence of violence against women.

Right: Jhumka Gupta (right) meets with local leaders in a village in Ivory Coast on ways to reduce the incidence of intimate partner violence. She has worked in a variety of cultures and countries, including the United States, Bangladesh, Colombia, Haiti, Nepal and South Africa, on issues of gender violence.



(IRC), a humanitarian organization that started a village savings and loan association program in villages in Ivory Coast two years ago. About 1,200 women signed up for the two-pronged program, which provided them with access to a savings and loan association and participation with their partners in discussion groups about gender attitudes.

The State and Peace-Building Fund, administered by the World Bank, is supporting both the intervention and Gupta’s randomized controlled trial. Gupta’s research partners include Kathryn L. Falb, Sc.D., a postdoctoral associate at the Yale School of Public Health; Jeannie Annan, Ph.D., director of research and evaluation at the IRC; and Innovations for Poverty Action, a nonprofit dedicated to helping

the world’s poor. The program’s gender dialogue group is designed to challenge traditional male-dominated household norms.

“It starts off with a discussion of who contributes to the household and includes different exercises, role playing and homework,” Gupta says. “This is a very comprehensive curriculum that was developed by the IRC. They talk about how to make a budget together, how to make a decision about a household purchase together and who contributes what to the household. The aim is to get the idea [across] that women also do contribute to the household—to really try to change norms, which we hope will translate into a reduction of IPV.”



“The world is slowly starting to wake up to the fact that intimate partner violence is a pressing public health concern.”

~ Jhumka Gupta

Gupta says the program is designed “not to alienate men” but to work with them to change gender patterns. “It’s a very subtle approach,” she says.

She recently completed a rigorous evaluation of the program. The results are not in yet, but if the evaluation shows a decrease in the rates of IPV against women, Gupta says it will have very important implications for public health programming. “We’re definitely hoping for a promising outcome, particularly because it’s among the first types of interventions to focus specifically on IPV in a conflict-affected country.”

Reducing violence

In the short term, Gupta hopes to reduce the incidence of IPV among women in Ivory Coast and, ultimately, to improve their health. “In the longer term, we hope to take lessons learned from Ivory Coast and apply them to programming in other regions plagued by conflict to reduce IPV and improve the lives of women and communities.”

Also, she says, “We want to show that, despite the numerous challenges of doing research in an area that is impacted by conflict, it is possible to conduct a rigorous randomized trial and we can tackle IPV despite the obstacles.” The IRC, meanwhile, which works in over 40 conflict-affected countries, is eager to apply effective strategies as it develops programs to reduce IPV worldwide.

Gupta says she has also applied for research funding to explore the feasibility of conducting this intervention in Ivory Coast’s financial capital, Abidjan. “The current intervention very much relies on the closeness of participants. In rural villages, where ‘people behave like a large family,’ IPV is far more commonplace than in urban settings that are typically more fragmented,” she says.

During her last visit to Ivory Coast, Gupta says she had the opportunity to hear from women in Abidjan who shared the challenges they face from both IPV and food insecurity, as well as their desire to have more programs in their city that focus on these issues.

“Traditionally IPV was seen as something solely in the realm of the criminal justice world, not so much as a public health issue,” Gupta says. “The world is slowly starting to wake up to the fact that IPV is a pressing public health concern.”

She recently started a clinic-based randomized control trial in Mexico City to train nurses to ask about IPV and provide referrals to women at public health clinics. She also plans to conduct IPV research in urban slums in Latin America and would like to implement similar research interventions within communities in New Haven, including those impacted by community violence and those with growing immigrant populations.

Gupta became interested in public health while earning a bachelor’s degree in biology (with a minor in Spanish) at the University of Maryland. Working as a volunteer with families impacted by HIV in the Washington, D.C., area, she became aware of the tremendous impact that IPV had on many of their lives, and she wanted to help to get to the root of the issue. Her path to public health, however, actually began much earlier. As a daughter of immigrant parents, she learned about the hardships faced by her mother’s family as refugees during post-partition violence in Bangladesh. This led to Gupta’s interest in working with populations experiencing adverse circumstances.

“I got to be where I am today, in part, because my father was a very progressive thinker who encouraged my potential for contributions, regardless of what traditional norms dictated,” she says. “However, I saw that this was not the case for many of the women I encountered—and these women and their communities deserve better. We in the public health field have an enormous responsibility to apply our talents to ensure that this happens.” YPH

Valerie Finholm is a freelance writer in Denver, Colo.



Women and HIV

Research examines how social and cultural factors drive wide disparities in who becomes infected and why.

By Denise Meyer

The history of women with HIV/AIDS in the United States is really a story of racial and ethnic health disparities.

Overall, the rate of American women contracting the disease relative to men has climbed from 8 percent in the 1980s to 25 percent today. But most of this burden is in underserved communities: one in 32 African-American women will be diagnosed with HIV in her lifetime, as will one in 106 Latina women. Meanwhile, one in 526 Caucasian and Asian women will contract the virus. Death rates are also higher for African-American and Latina women, making HIV one of the leading causes of death for those groups.

Researchers at Yale's Center for Interdisciplinary Research on AIDS (CIRA) are examining the many and complex reasons for these disparities with a variety of studies that consider how behavioral and cultural factors may be putting minority women at disproportionate risk.

Cultural norms

"The spread of HIV, in theory, could be prevented," says Sarah K. Calabrese, Ph.D., a postdoctoral fellow at CIRA, who is studying how social, psychological and behavioral factors affect HIV acquisition.

Driven to understand barriers to condom use, Calabrese's research focuses on African-American women and how social and cultural norms influence a woman's sexual self-concept and confidence in asserting herself in sexual situations, such as discussing condom use with a partner.

Calabrese has found that a woman's acceptance of the idea that sex should be used as a commodity, for example, is associated with a negative sexual self-concept and indirectly associated with confidence in sexual situations, the latter of which has been consistently linked to sexual risk-taking among African-American women.

"The findings speak to the need to make changes in the culture," says Calabrese. Sexual stereotypes can be addressed on the individual level, but continued efforts are needed at the societal level. This means reducing negative portrayals of African-Americans in the media and promoting strong, successful role models. Replacing oversexualized, stereotypical portrayals of African-Americans with more positive images and messages about their sexuality could have implications for African-Americans' sexual experience.

Some sexual stereotypes are rooted in slavery, says Calabrese, such as the "hypersexual" woman or the woman who is perpetually available sexually, an image that was constructed by slave owners to justify rape.

“I’m interested in how these and other racialized sexual stereotypes that persist in today’s society are associated with African-American women’s sexual health and well-being,” she says.

Promoting condom use is critical for African-American women who are living in communities with a high HIV prevalence. However, Calabrese says, this effort can be complicated by factors such as the scarcity of partners due to high rates of incarceration and premature deaths among African-American males in the United States, both of which can contribute to a woman’s willingness to forgo condom use in order to maintain a sexual partnership.

Bundling HIV prevention

Other researchers are seeking to reduce women’s HIV risk, as well as other sexually transmitted infections (STIs), while also improving pregnancy outcomes, for women in underserved groups ranging in age from 14 to 21.

Using a group care model known as Centering Pregnancy Plus, Jeannette R. Ickovics, Ph.D., professor and founding director of the Social and Behavioral Sciences Division and the principal investigator of a National Institute of Mental Health Interdisciplinary HIV Prevention Training Program at CIRA since 1999, and her colleagues are evaluating an intervention now being used in 14 hospitals and community health centers in New York City where STI rates are above the national average. Sexually risky behaviors and contracting an STI are known risk factors for HIV infection.

A pilot study in Atlanta and New Haven, where 80 percent of the participants were African-American, showed that young women who participated in the intervention were less likely to become pregnant again within six months, increased their condom use when having sex and reduced the incidence of STIs at the end of their pregnancies.

Using data gathered from the project, Lisa Rosenthal, Ph.D., a CIRA postdoctoral fellow, has also established a link between experiences of discrimination and ensuing risky sexual behaviors and contracting an STI during pregnancy.

“This finding adds to an ever-growing body of literature demonstrating the far-reaching, deleterious effects of discrimination,” Rosenthal says. “It suggests that we must find ways to reduce discrimination in order to reduce disparities and improve health, including the reduction of a woman’s risk of contracting HIV and other STIs.”

IPV and HIV

Another contributor to the high rates of HIV among some groups of women is intimate partner violence (IPV). One recent estimate found that more than one in three women has experienced rape, stalking and/or physical violence in her lifetime.

Not only is IPV a distinct risk factor for HIV; it also affects non-Caucasian women at higher rates than it affects Caucasians, although this difference started to decrease in the 1990s.

“The two epidemics, HIV and IPV, are linked,” says Nicole Overstreet, Ph.D., a postdoctoral fellow at CIRA. Women who experience IPV may be at higher risk due to several factors, including substance use, post-traumatic stress and depression. Moreover, experiences of IPV have been connected to other HIV transmission risks, such as coerced sex, higher rates of STIs and sex with partners who engage in risky behavior, such as injection drug users.

For both of these epidemics, the contributing social factors need to be addressed. For instance, Overstreet found that experiencing stigma with regard to IPV, such as being told “you deserved it” or “you provoked it,” is linked to greater HIV risk behavior. More research is needed to find out whether addressing such stigma could reduce HIV risk, and mental health issues that have been linked to HIV risk.

Meanwhile, a newer approach to HIV prevention approved last July by the FDA, known as pre-exposure prophylaxis, or PrEP, provides antiretroviral drugs to HIV-negative women who are at high risk for HIV. The goal is to reduce their susceptibility to infection. While the strategy is intended to complement condom use, the CIRA researchers believe it also has the potential to benefit women who are at risk because of difficulty negotiating condom use.

Looking toward the future of HIV prevention, Overstreet notes that it is important to remember that experiences of IPV can interfere with access to medical care and stable housing—factors that affect adherence to antiretroviral therapy among people living with HIV/AIDS and could similarly be challenging for PrEP access and adherence for HIV-negative women experiencing IPV.

“The social and structural challenges of HIV prevention and interventions are multifaceted, and sometimes the pieces are difficult to put together,” Overstreet says. “Many of these difficulties require addressing social and structural barriers, such as poverty and violence, that escalate the HIV epidemic.” YPH

“The two epidemics, HIV and intimate partner violence, are linked.”

—Nicole Overstreet



Reshma Trasi

Q&A

Advocating women's health

An alumna who has worked around the world takes inspiration from people with the courage to do what is right.

Since her studies at the Yale School of Public Health, Reshma Trasi, M.B.B.S., M.H.A., M.P.H. '05, has worked globally to evaluate, plan, research and manage programs that address and improve the health of women and communities. This work has taken her to India, Southeast Asia and parts of Africa and the United States, where she has worked to address health issues as diverse as HIV/AIDS, reproductive health and gender-based violence as well as leadership, management and governance. Today, Trasi is the director for monitoring, evaluation and research at Management Sciences for Health, a Massachusetts-based organization that seeks to build stronger health systems around the world. Previously, she was an HIV, AIDS and development advisor at the International Center for Research on Women and a research coordinator at the Yale Center for Interdisciplinary Research on AIDS.

Broadly and globally speaking, what is the state of women's health today?

RT: It all depends on how old she is, where she lives, the kind of education she has had, the extent of control she has over her own body and over resources like land and money. All these help the choices she has to make on a daily basis for her own health and that of her family. Today, 200,000 fewer women die in childbirth than in the 1990s. But there are huge variations. The odds of a woman dying in childbirth in parts of Europe are 1 in 30,000. In poorer parts of the world, they are 1 in 6. To borrow a quote from *Women Deliver* – “no woman should die giving life.” But, they do. They die because health systems, policies, laws and health care technology fail to respond to their needs. Repeatedly. But women's health is not just about what happens around childbirth. It is also about a woman's sexual and reproductive health; her access to contraception regardless of her age or marital status; her access to comprehensive sex education and to legal and safe abortions; and her ability to make healthy choices that are good for her.

Compare the situation today with that of, say, 25 years ago. What are the main trends?

RT: The health of women and girls is increasingly being recognized as an economic development issue. There is awareness that investing in women and girls' health and education is the smart thing to do. Every dollar invested in the health of women and children generates 20 dollars of benefits. If a woman in Nigeria has one less child, the country's GDP could grow by 13 percent over the next two decades. These are compelling arguments for investing in women's health.

What health issue or issues affecting women concern you the most?

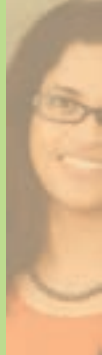
RT: Gender-based violence and the denial of women's economic, legal, sexual and reproductive rights are issues that keep me awake at nights. These are both integrally linked to a woman's health. Don't let anyone tell you otherwise. One in three women experiences some form of violence in her lifetime. Every girl and woman deserves to live with dignity, in a safe environment and with the same access to resources and services as anyone else.

Is there reason to believe that this issue will improve in the foreseeable future?

RT: I hope so! I find that many governments want to do the right thing when the evidence and its implications are presented to them.

You have worked extensively with HIV/AIDS prevention strategies for women. What are the biggest obstacles that still need to be addressed in this area?

RT: We need better program efficiencies; programs function in silos and do not speak to each other. HIV programs in many countries have done a good job of linking prevention, counseling, testing, treatment, care and support. And that's good. But funding for programs to address the causes that place women at risk – like referrals for women who experience violence or seek legal or financial assistance – is not always easily available. In some countries, the program that provides HIV-positive women with medicines is not always connected to the national maternal and child health program. Programs that address gender inequalities or engage men in women's health are still few and far between.



“There is awareness that investing in women and girls’ health and education is the smart thing to do.”

–Reshma Trasi

Politics and cultural traditions in specific countries or regions can have a big effect on women’s health.

Can these obstacles be overcome?

RT: It is slow progress because there are deeply entrenched beliefs and interests. And I have tremendous respect and admiration for those who work to address women’s rights every day. I firmly believe that we need more national and political champions for these issues in every country and at every level. We need more women where it matters – at the decision-making table. We have to get evidence into the hands and hearts of policymakers. We also need a groundswell of men who will stand up for women’s health.

What other systemic factors are affecting women’s health around the world?

RT: Health systems are stretched thin and are under-resourced. In addition to providing health services, doctors, nurses and community health workers are expected to just “know” how to manage and coordinate a national health program. I did not learn financial management in medical school. But I had to know how to run a primary health center, supervise a team, report to multiple national health programs, oversee the pharmacy’s supply chain and deliver health services. Within the Leadership, Management & Governance Project at Management Sciences for Health, where I now work, we are exploring ways to work with governments to strengthen the leadership, management and governance capacity of women, who are caregivers as well as service providers in any health system. These women – like the midwives in Afghanistan – are providing services in socially and economically constrained environments. And they are doing tremendous work.

Many governments have paid attention to addressing these systemic factors for women and children. Do you see a particular success story?

RT: Nigeria recently launched the Saving One Million Lives Initiative, which aims to avert 230,000 maternal deaths. There are similar commitments from several other national governments like those of India and Malawi. We know what works to reduce maternal deaths. Countries are enforcing laws on child marriage and modifying archaic laws that will reduce violence against women. There is a lot happening in the United States as well, with organizations rallying

Congress to pass the International Violence Against Women Act recently. The U.S. government’s PEPFAR program and USAID are doing a tremendous job of strengthening health systems in countries around the world.

What inspires you?

RT: Extraordinary people who use the mantle of power for the greater good. And ordinary people who do extraordinary things. Like Priya – a woman leader in India – who told me that she disclosed her HIV status so no other woman would go through what she did.

Who inspires you? Why?

RT: My husband, Kyle. He inspires me to take on new challenges. I’m also a product of my family. My mom and her father have instilled social justice in my DNA. They’ve taught me that the good fight is worth dedicating one’s life to. My grandfather believed that educating girls and putting money in women’s hands was the way to advance a community. My father has taught me the value of good, honest, uncompromisingly ethical and diligent work. I also get my travel bug from him. So, global public health, which combines health, social justice and work with global communities is the perfect place for me to be.

How did you first become interested in the field of women’s health?

RT: I had just graduated from medical school in the late 1990s and was managing a primary health center in rural India, and I could not understand why my patients, who included 17- to 19-year-old girls with two or three children, were not practicing birth spacing. Contraceptives were freely available. So were condoms. When I asked them, they told me about their lives, about their relationships and about how they were not able to make decisions about their own bodies. I stepped out of my clinic and into their homes. And the more I talked to their families, the more I realized these were issues that I could not treat with a prescription. If these were the root cause, I realized that I needed to move away from clinical medicine. So I did. [YPH](#)

Michael Greenwood

Another tick disease

Yale research confirms that a new tick illness has already infected people in the United States.

A new tick-borne illness that shares many similarities with Lyme disease has been found in 18 patients in southern New England and neighboring New York.

It is the first time that the disease, which is so new that it does not yet have a name, has been confirmed in humans in the United States.

Researchers from the Yale School of Public Health and School of Medicine used blood tests to detect evidence of infection by a bacterium that is found in deer ticks and related to, but different from, the one that causes Lyme disease. The researchers found positive results for the new disease in 21 percent of 14 patients with unexplained summertime febrile illness, 3 percent of 273 patients with Lyme disease or suspected Lyme disease and 1 percent of 584 healthy people living in areas where Lyme disease is endemic.

The bacterium, known as *Borrelia miyamotoi*, was first discovered in deer ticks from Connecticut more than 10 years ago, but it was not until 2011 that Yale scientists published the first evidence of human infection amongst patients in Russia. The latest study was designed to determine whether human infection occurs in the United States and, if so, the prevalence of infection.

In addition to finding 18 people infected with the disease, the researchers also discovered a seroprevalence rate of 1 percent in a sample of healthy southern New England residents. This suggests that potentially thousands of Americans will be infected with *B. miyamotoi* each year. It is likely that many cases will be identified as physicians become aware of the infection and laboratories develop the tests needed to make a correct diagnosis.

“While many symptoms of *B. miyamotoi* are similar to those of Lyme disease, such as fever, headache, muscle aches and chills, the telltale rash associated with Lyme disease was observed in only a small fraction of patients. Patients suffering from the new disease also may experience unique symptoms, such as relapsing fever,” said Peter J. Krause, M.D., senior research scientist in the Department of Epidemiology of Microbial Diseases and primary author of the study. The report was published in January in the *New England Journal of Medicine*.

Although blood tests for Lyme disease will not detect infection with the *B. miyamotoi* bacterium, antibiotic treatment should be the same as for Lyme disease, Krause said. All patients in the study were from the Northeast, but

researchers believe that cases may occur in other areas of the country where Lyme disease is endemic. The bacterium has been found in about 2 percent of all deer ticks that also transmit Lyme disease, babesiosis, human granulocytic anaplasmosis and other tick-borne diseases.

“This is the first time we have found an infectious organism carried by ticks before we have recognized a disease in humans,” said Durland Fish, Ph.D., professor in the Department of Epidemiology of Microbial Diseases and the study’s senior author. “We usually discover a new disease during an epidemic and then try to figure out the cause.”

Fish and his Yale colleagues specialize in tick-borne diseases, with an emphasis on environmental surveillance for ticks and tick-borne pathogens. [YPH](#)

Michael Greenwood

“Patients suffering from the new disease also may experience unique symptoms, such as relapsing fever.”

—Peter Krause

Student Spotlight

Health in conflict

An M.P.H. student undertakes a challenging summer internship in Lebanon to assess the health needs of Syrian women displaced by civil war.

By Amelia Reese Masterson

“In Syria it is a fast death; here it is a slow death,” a woman lamented as she described her situation as a refugee in Lebanon escaping an escalating civil war in her homeland.

Each woman’s story was different, but they were all sad, grim. Another refugee had five children and a husband who is detained somewhere back home. “When a father is present you might be able to afford some of the children’s needs, but if he’s not, from whom do you seek help?” she asked.

These women were part of a focus group discussion to explore how it feels to be uprooted from a quiet life in Syria by a conflict that has grown steadily more violent. My colleagues and I were seeking to understand and characterize basic needs and daily struggles, reproductive health issues and experiences of gender-based violence faced by too many displaced Syrian women.

As a researcher interviewing Syrian refugee women for the United Nations Population Fund (UNFPA), I heard stories of hardship, loss and suffering again and again throughout my three-month summer internship in Lebanon in 2012. The conflict in Syria responsible for this refugee crisis began in March 2011 amidst a harsh government crackdown on protestors and civilians. After a year working at UNICEF Syria during the Iraqi refugee crisis of 2007-2008, I remain in close touch with Syrian friends who update me on the atrocities and violence that civilians face. Though the rebellion to oust President Bashar al-Assad has made some gains, there is no end in sight. By the beginning of 2012 it was estimated that 60,000 people had been killed in Syria.

Since entering the Yale School of Public Health in 2011, I have been thinking about how to support Syrians using my public health education and skills. When an opportunity arose to work alongside a doctor in Lebanon to conduct a rapid assessment of reproductive health and gender-based violence among displaced Syrian women for UNFPA, I immediately knew that I wanted to go. As an



During a summer internship in Lebanon, Amelia Reese Masterson traveled around the country to interview Syrian women who fled fighting in their homeland. Starting in the capital of Beirut, the dotted line shows Reese Masterson’s destinations.

M.P.H. student, I also went to Lebanon to fulfill my internship requirement for graduation, and I hoped that my skills in data collection and analysis would be of some benefit to the growing refugee population.

I arrived in Beirut in June amidst reports of an increasing flow of displaced Syrians and of the possibility of violence spilling across borders and upsetting Lebanon’s own fragile balance. The number of refugees in Lebanon rose from around 10,000 when I first arrived to 90,000 when I left in August. Today, the United Nations estimates that there are 170,000 displaced Syrians in Lebanon, the majority of whom are women and children.

During my first few days, I met with the reproductive health doctor at American University in Beirut with whom I would work closely on the project. The task seemed daunting: assess the status and needs of Syrian women across

Student Spotlight

two regions of Lebanon and gather useful data on the sensitive topics of reproductive health and gender-based violence. This information was intended to inform UNFPA's emergency program for Syrian refugee women and families and to contribute important women's health statistics for other agencies and nongovernmental organizations working to help this population.

I developed partnerships with six clinics across Lebanon, hired and trained eight data collectors and established contact with community centers serving the Syrian population. I attended many United Nations field coordination meetings to better grasp the situation and to begin to map women's health services. I also spent hours on the phone with various clinics, introducing our project and arranging site visits.

After a month of preparation, data collection finally began. I took a taxi to the bus station in Beirut for the long journey to northern Lebanon. This would be my first trip to the study site in the town of Heshha, located in the mountainous border region with Syria. It would also be my first time overseeing data collection done completely in Arabic.

The northern region where three of our clinic study sites were located is guarded by military checkpoints, and a non-resident must obtain a pass to enter. As our bus drew near, I doubted whether this remote outpost had received notice of my U.N. pass. But being packed into a local minibus came in handy; the soldiers barely noticed me.

Upon arriving at the Heshha clinic, I began reviewing recruitment and survey procedures with the three local data collectors we had previously trained. We started interviews that day, and although the Syrian women who elected to participate were a bit nervous at first, they warmed to us and soon openly shared their stories.

The project was intense and there was little down time. But by summer's end we had interviewed 452 displaced Syrian women, more than double the number I originally thought possible within our time frame. In addition to the surveys, we also conducted three focus group discussions to gather more detailed, descriptive data on Syrian women's perceptions and use of reproductive health services, experiences of violence and coping strategies.

In settings of conflict and displacement such as this, it is common to find an increase in women's susceptibility to reproductive health problems and gender-based violence. The stories we heard confirmed this. Women spoke of



Amelia Reese Masterson (second from right) and data collectors outside of a clinic in the northern Lebanese town of Bireh that is run by the Rafik Hariri Foundation. Reese Masterson and colleagues interviewed many Syrian women inside the clinic and around the neighborhood.

difficult pregnancies and a lack of money for ob-gyn services. They spoke of heightened tensions in homes with crowded conditions, few activities for children and cases of intimate partner violence. They also spoke of abuse and violence at the hands of armed men back in Syria.

For me, it was not until sitting down back in Beirut at the end of the summer with 452 lines of data that the enormity of the situation sunk in. These represented 452 individual stories of struggle that started amidst violence in their home country and now consisted of a life in limbo and an uncertain future. I *chose* to spend my summer in Lebanon, but I had the luxury of a return ticket. These women may not have the simple joy of returning to the homes they spoke of so longingly in rural regions of Syria or in urban centers such as Homs or Damascus.

The Syrian women I spoke with last summer are facing their displacement with great strength, at times caring for children and relatives without the support of a husband. Among the many issues they voiced, the need for reproductive health care and psychosocial support stood out.

This was a pivotal experience for me. Not only did it give me the opportunity to apply the public health skills I gained during my first year at YSPH, but it also gave me a greater understanding of the many health issues faced by women in conflict settings. I left Lebanon inspired to pursue a career at the intersection of research and program management, and with a desire to return to this region and continue public health work among conflict-affected or marginalized populations. [YPH](#)

Amelia Reese Masterson is a second-year M.P.H. student at the Yale School of Public Health. The internship was supported by the Okvuran Fund for International Support.

Alumni Spotlight

Evaluating Health

An alumna helps to develop and implement a statewide system for measuring patient health care experiences and partners with *Consumer Reports* to make the results public.

By Theresa Sullivan Barger

When Barbra Rabson proposed releasing her health coalition's patient experience survey results in *Consumer Reports*, some doctors balked. The practice of medicine, they said, can't be compared and rated like toasters.

Despite the pushback—and with the backing of doctors who supported the information's release—the Massachusetts Health Quality Partners (MHQP) board of directors moved forward. In July 2012, Massachusetts became the first state to publish statewide patient reports on nearly 500 primary care and pediatric practices in a special *Consumer Reports* magazine insert.

The publication of some 65,000 consumer ratings represented both the culmination of nearly two decades of work by MHQP, a nonprofit coalition of physicians, hospitals, insurers, consumers, researchers and government agencies, and a commitment to patient and public engagement. Rabson, M.P.H. '83, has been MHQP's executive director since 1998.

The public response was enormous. The month the 24-page insert was published in Bay State editions of the magazine, newsstand sales jumped 110 percent and it spawned some 180 media stories.

"It was a real milestone toward our commitment to public engagement," says Rabson, who joined the now-18-year-old organization after working for Blue Cross Blue Shield of Massachusetts, Beth Israel Deaconess Medical Center, the Massachusetts Hospital Association and Middlesex Memorial Hospital in Middletown, Conn.

"Massachusetts Health Quality Partners is on the cutting edge of providing reliable, meaningful and fair information about primary care physicians to consumers," John Santa, M.D., M.P.H., director of the *Consumer Reports* Health Ratings Center, said upon the report's release.

Promoting transparency

After publishing the survey results in *Consumer Reports*, MHQP's profile as an organization promoting transparency and accountability grew. Already a recognized leader in its

How Does Your Doctor Compare?

- Exclusive: Patients rate 487 adult, family & pediatric practices
- How to get the best care
- Quiz: Does your physician measure up?



Courtesy of Consumer Reports

Consumer Reports magazine printed a special section in July 2012 using data from the Massachusetts Health Quality Partners statewide survey of patients' experiences with nearly 500 primary care and pediatric practices in Massachusetts. It was the first time the magazine had published such ratings.

field, Rabson had been helping other states replicate what was done in Massachusetts. But the publicity increased the number of inquiries Rabson received.

"The Institute of Medicine has asked me to come and present on a panel about transparency and sharing data with the public," she says. "There's a huge amount of interest."

Rabson recently met with 26 Regional Health Improvement Collaboratives to educate those in the Washington, D.C., area about how regional measurement and public reporting efforts such as MHQP's can promote patient care and improve health care value.

The article in *Consumer Reports* grew from years of tending the transparency garden. MHQP has been posting the biennial surveys of patients' experiences with medical practices on its website and releasing reports to physicians since 2006. The organization has earned the trust of doctors, who have taken note of survey results, and year-to-year surveys show across-the-board improvements. But the general public remained largely unaware of MHQP and its surveys, Rabson says.

Doctors who had been concerned that the *Consumer Reports* story would cast them in an unprofessional light found that their fears were largely unfounded. Surveys of *Consumer Reports* subscribers taken after the magazine's release showed that 25 percent of respondents felt better about the state of health care in Massachusetts, 67 percent felt the same, 3 percent felt worse and 5 percent were undecided.



Barbra Rabson (left) converses with Polly Marvin, a colleague at Massachusetts Health Quality Partners and fellow YSPH alumna. Rabson leads the organization, which is spearheading surveys on patients' health care experiences and publishing the results to help patients make more informed choices and help physicians improve the care they provide.

A partnership is created

Consumer Reports approached Rabson in 2009 about publishing MHQP's patient survey data. The proposal fit nicely with her group's mission.

"We have stated in this country that engagement with patients and the public is important and that transparency is essential to getting the public to make better choices," she says. "We are constantly pushing the bar to make our work more and more accessible to the public."

Two years of discussions and planning ensued, and the Robert Wood Johnson Foundation agreed to fund a pilot project between *Consumer Reports*, MHQP and two peer organizations in Minnesota and Wisconsin. After the release of the Bay State study results, *Consumer Reports* published results gathered from health collaboratives in Minnesota in August 2012 and in Wisconsin in January 2013.

The statewide survey of patient experiences measured the quality of patient-doctor interactions, level of communication, physicians' knowledge of the patient, health promotion, access, whether patients felt they could reach someone at the practice, continuity of care from one visit to the next and whether the staff treated patients respectfully.

The survey revealed high- and low-quality practices in every region of Massachusetts. It rated 329 adult practices and 158 pediatric practices and queried 47,565 adults and 16,530 parents, all with health insurance, about their primary care physicians and their children's pediatricians, respectively.

Using its signature ratings system with red and black circles, *Consumer Reports* listed patients' responses to a number of questions and scored each practice on patients' willingness to recommend the practice to others. The report also included an editorial section that focuses on what patients can do to improve their care experiences.

MHQP launches

Massachusetts Health Quality Partners formed in 1995 in response to an investigative story in *The Boston Globe* that rated hospitals based on mortality data. Hospital administrators and physicians rejected the report and found themselves on the defensive, Rabson says.

The late H. Richard Nesson, M.D., the president of Brigham and Women's Hospital and chair of the Massachusetts Hospital Association at the time, said the medical

community would always be on the defensive if outside entities measured it, and he realized how bad that looked to the public.

"This was way back in 1994, before anyone put health care and transparency in the same sentence," Rabson says. Nesson gathered a group of health care leaders and recommended a statewide quality measurement project that became Massachusetts Health Quality Partners. They hired a health researcher who suggested assessing patient experiences because of the importance of the data to improving care and because this hadn't been done before on a wide scale.

After securing a grant from the Commonwealth Fund and the Robert Wood Johnson Foundation in 2001, MHQP piloted a study of patients' experiences with primary care physicians. Over the next few years, the organization's board expanded to add a physician council and consumer representatives, and health care leaders from across Massachusetts met to discuss the public release of health quality information. MHQP continued to grow.

"The organization has changed so much," Rabson says. "In the beginning, the challenge was [to] find something that everybody could agree on. We would have gone out of business a long time ago if we had stayed with that model." As the leader of the collaborative, Rabson has worked to find common ground and innovate.

"Collaboratives are not for the faint of heart," says Rabson, crediting her staff. "Where things are clear, that's not where we belong. We tend to be the first in an area. We'll tackle something because it hasn't been done before."

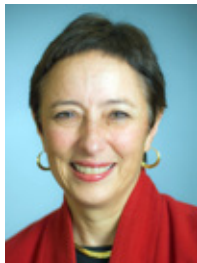
YSPH Dean Paul D. Cleary's connection to MHQP goes back to its inception. He was part of a group that advised the organization on possible initiatives and his work still overlaps with that of MHQP and Rabson. The survey that MHQP uses is based on the Consumer Assessment of Healthcare Providers and Systems (CAHPS) survey; Cleary leads one of two teams in the country responsible for maintaining and updating the CAHPS survey.

"Since those early days, Barbra has continued to lead and develop MHQP to the point where it is one of the top state coalitions in the country promoting quality improvement activities," Cleary says. "It is wonderful to still have a link to Barbra's work and to see one of our alumni be such an effective and successful leader in the field of health care quality."

Continued on page 49

Alumni News

1980s



President Barack Obama has appointed **Judy E. Carber**, M.D. '81, M.P.H. '81, to the National Cancer Advisory Board. An associate

physician at Brigham and Women's Hospital in Boston since 1988, Judy has been the director of the Center for Cancer Genetics and Prevention at the Dana-Farber Cancer Institute since 2010 and professor of medicine at Harvard Medical School since 2011. She is the immediate past president of the American Association for Cancer Research and serves on its board of directors. In addition, she is a member of the Scientific Advisory Board of the Breast Cancer Research Foundation and an American Society of Clinical Oncology Fellow.

John Montgomery, M.P.H. '84, has been named vice president and medical officer of Humana's commercial markets in Florida.

1990s



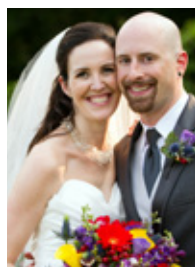
Linda Rabeneck, M.D., M.P.H. '90, a former Robert Wood Johnson Clinical Scholar at Yale, was elected to a fellowship in the Canadian Academy of Health Sciences (CAHS) in September. The CAHS is the Canadian counterpart of the Institute of

Medicine in the United States. Academy Fellows are recognized by their peers nationally and internationally for their contributions to the promotion of health science and for having demonstrated leadership, creativity, distinctive competencies and a commitment to advance academic health science. Linda, professor of medicine at the University of Toronto, currently serves as vice president, Prevention and Cancer Control, at Cancer Care Ontario, the province's cancer agency.

2000s



Jessica Federer, M.P.H. '08, is the new global head of executive communications and public relations for Bayer Healthcare's Animal Health Division. She will lead the international team that works in communications, public relations, government affairs and advocacy. Jessica has been living in Berlin, Germany, for the last three years and will relocate to the Dusseldorf area for her new position.



Megan Lindley, M.P.H. '04, married Michael Wilt in Atlanta, Ga., in May 2012. Many friends of the couple attended the celebration, including **Mary O'Neil**, M.P.H. '04, and **Allison (Balling) Nihiser**, M.P.H. '04. Megan is an epidemiologist at the Centers for Disease Control and Prevention.

Steve Moore, M.P.H. '04, M.Phil. '06, Ph.D. '07, is a finalist for the National Institutes of Health Earl Stadtman Investigator track. The search for Stadtman Investigators is an effort that crosses all areas of biomedical research at the NIH to attract diverse and talented early-career scientists who might not apply for a more narrowly defined position at the NIH. As a finalist, Moore will be able to explore opportunities that meet his particular research goals.



Megan Sands, M.P.H. '08, Ph.D., married James Lincoln IV, M.D., on November 24 in Big Sky, Mont. Megan is currently working on her postdoctoral fellowship in clinical epidemiology at the University of Pennsylvania School of Medicine.

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.

“The competition was Yale at its best: thinking from a variety of disciplines – public health, business, medicine, law – focused on solving a problem of tremendous importance in global health.” – *Gregg Gonsalves, competition judge*

Global competition

Students tackle complex global health problem in inaugural Yale competition.

Simmering tensions at the Marikana mine erupted last summer as striking workers and police clashed in a confrontation that was aired on television. When the spray of gunfire finally stopped, 34 miners were dead and many others lay severely injured.

Everyone agreed that the violence in South Africa was horrific and a tragedy. But it also drew attention to the deep economic, social and health disparities faced by miners, many of whom struggle to make a living while working in conditions that are dangerous and unhealthy.

The question now is, can policy and health responses improve conditions to the point that miners will not feel compelled to strike or to confront police in the first place?

Half a world away, more than 100 Yale undergraduate and graduate students from eight professional schools participated in the inaugural Global Health Case Competition at the School of Public Health in November and presented recommendations to solve a deeply rooted and seemingly intractable problem.

Each of the 20 student teams had less than a week to research and formulate their responses before giving a presentation to a panel of 20 judges drawn from university faculty as well as public health practitioners and consultants, including Fatima Hassan, a prominent South African human rights lawyer and activist.

“The difficulty of the assignment



The winning team in the inaugural Global Health Case Competition at Yale includes (left to right) Yi Zhou (SOM), Jordan Slosower (YSM), Bingnan Zhang (YSM/SOM), Ryan Boyko (YSPH), Hilary Rogers (B.A./M.P.H. program) and Javier Cepeda (YSPH). The six students competed against 19 other Yale teams for the \$3,000 first-place prize and the chance to travel to Emory University for an international competition.

was that before we could even begin to make recommendations, we had to spend a tremendous amount of time and effort in understanding the history, context and tensions that exist in the mining industry, a topic that was foreign to all of us,” said Javier Cepeda, a doctoral student at the School of Public Health and a member of the winning team. “Coming up with a framework from which to guide our recommendations also proved especially challenging.”

Cepeda’s team approached the challenge by identifying the topics they found to be most pertinent to the problem and then splitting them up evenly among the team’s six members. Their preparation included a marathon session to synthesize their proposal and integrate all of the recommendations into a coherent action

plan. Among their recommendations were a more responsible business plan for mine owners, adequate housing for miners, reduction of the tuberculosis rate and wage equity.

The plan was innovative and linked a human rights framework to political, social and economic development initiatives, taking the interests of all key stakeholders into account, said Rafael Pérez-Escamilla, Ph.D., professor in the Department of Chronic Disease Epidemiology at the School of Public Health and one of the event’s judges.

“It demonstrated the application of high-level critical thinking skills to a constructive approach to preventing a similar tragedy involving the unnecessary deaths of miners at the Marikana mine from ever happening again,” he said. “At the end of the day the

Harold Shapiro (2)

“I lucked out and wound up working with a group of incredibly committed and intelligent students who came from different disciplines and made their own individual contributions.” –*Hilary Rogers, student participant*

winning team also distinguished itself by its collective assertiveness and by the thoughtful responses given to the many questions and concerns raised by the highly diverse audience.”

The winning Yale team, which in addition to Cepeda included Ryan Boyko (YSPH), Hilary Rogers (Yale College/YSPH), Bingnan Zhang (YSM/SOM), Jordan Slosower (YSM) and Yi Zhou (SOM), traveled to Emory University in Atlanta in March to compete in an international competition. Yale finished second, ahead of 22 other teams.

Rogers, who traveled to Emory in 2012 for the international competition, enjoyed it so much that she wanted to participate again this year.

“I lucked out and wound up working with a group of incredibly committed and intelligent students who came from different disciplines and made their own individual contributions,” she said. “I think this is what

helped us win – not only did we work exceptionally well for not really having known each other before, but we also took an interdisciplinary approach to the case.”

It was a challenge for the teams to gain a strong understanding in under a week of the long history of political, social and cultural issues of South Africa, a country no team member had ever visited. “It wasn’t possible to fully understand all of the factors that led to the tragic shooting of South African miners on August 16, but we tried our best,” she said.

As a B.A./M.P.H. student, Rogers has just started focusing on public health and global health in her academics. The case competition, she said, gave her an opportunity to use what she has learned in class and showed her many potential career options in global health.

Three students, Jared Augenstein, M.P.H. ’12, Sejal Hathi (Yale College)

and Sunny Kumar (Yale College), in conjunction with several faculty advisers, organized the inaugural event.

“In organizing this competition, we hoped to incubate cross-campus collaboration between students of all schools to devise realistic yet innovative solutions to tackle a pressing global health issue. Based on the positive response we have received from South African experts, we believe the competition to have been a resounding success,” said Augenstein.

Student interest in global health has grown sharply at Yale, and the university has responded with a variety of programs and initiatives to meet the demand. The School of Public Health, for example, offers a Global Health Concentration, and the university has created the Yale Global Health Initiative (GHI) and the Yale Global Health Leadership Institute (GHLI), among many other programs.

Gregg Gonsalves, a doctoral student at YSPH who has done research in South Africa and who served as a judge for the competition, said the event showed what Yale students can offer.

“I was overjoyed to see so many bright young minds apply themselves to the plight of miners in South Africa. The epidemics of HIV, tuberculosis and silicosis among this population are a public health and human rights catastrophe. Although the teams had only a week to prepare for the competition, their presentations bubbled up with new ideas and approaches for governments, the industry, the unions and international agencies,” Gonsalves said. “The competition was Yale at its best: thinking from a variety of



Javier Cepeda, YSPH student and a member of the winning team, makes a point to the 20-judge panel during his team’s presentation.

“Murder is a disease of poverty and inequality. It is a problem that is almost certainly going to get worse.”

—Peter Donnelly



Harold Shapiro

Rafael Pérez-Escamilla, YSPH professor and a competition judge, poses a question during the daylong global health competition that challenged 20 student teams to come up with viable solutions to the problems faced by South African miners.

disciplines — public health, business, medicine, law — focused on solving a problem of tremendous importance in global health.”

Elizabeth H. Bradley, Ph.D., professor in the Department of Health Policy and Management and faculty director of both the GHI and GHLI at Yale, started the daylong event at the School of Public Health with a welcome to the students and judges.

“The event far exceeded my dreams about what might be possible in global health at Yale,” Bradley said. “To have such interdisciplinary work across so many schools and departments focused on a critical issue of human health in the world was inspiring and just awesome.”

Michael Greenwood

Treating violence as a public health problem

Researcher maintains that street violence can be curbed through public health interventions.

Each year there are some 500,000 murders worldwide, a rate that is projected to increase. Only HIV/AIDS currently claims more lives.

But if violence is approached from a public health perspective, a radical notion in some quarters, many murders and other acts of violence could potentially be prevented, Peter Donnelly, M.D., suggested during a Dean’s Lecture in October.

While the origins of violence are complicated and involve familial, societal, gender and cultural factors, one thread that connects almost all violent perpetrators is a lack of hope for a better future. Seen this way, violence becomes a means of survival.

“Murder is a disease of poverty and inequality,” said Donnelly, a professor at the University of St. Andrews in Glasgow, Scotland. “It is a problem that is almost certainly going to get worse.”

Donnelly outlined a program known as the Community Initiative to Reduce Violence (CIRV) that is modeled on a public health intervention and has had marked success in the past few years in reducing Glasgow’s street-level violence that typically occurs between youthful, mostly male gang members.

With CIRV, which was inspired by programs in the United States, police bring together youthful offenders from rival gangs and mothers of young men who have been killed in gang violence to participate in educational programs featuring health workers who illustrate the injuries suffered by gang members and ex-offenders.



Peter Donnelly makes the case during a Dean’s Lecture that rampant violence in many parts of the world is a public health issue and needs to be treated as such.

Participants are also offered incentives to avoid violent behavior, including job training, health services and diversionary activities such as sports.

A follow-up study to gauge the program's effectiveness showed a nearly 39 percent decrease in violence in the first year and an almost 53 percent reduction by the program's second year.

Donnelly cautioned, however, that violent behavior is very difficult to change and that Glasgow's approach might not even succeed in another Scottish city, never mind another country or culture. Donnelly works closely with the World Health Organization and has studied the phenomenon of violence in a number of countries beyond Scotland, including South Africa, Jamaica and Lithuania.

Scotland, he noted, does not have to contend with a large number of guns, which foster violence in many other parts of the world, and drug use and dealing are not as pronounced. The city also does not have the same racial and ethnic issues that are present in other societies.

But, he noted, people everywhere share common aspirations and hopes. They want jobs to provide for themselves and their families, to have self-respect and to be treated with dignity.

"These young guys are surprisingly like you and me," Donnelly told the public health students and faculty gathered in Winslow Auditorium. "What they are really asking for is the stuff that all of us take for granted."

M.G.



William Murk

The genetics of asthma. All of the genes that have ever been reported to contain polymorphisms that influence the risk of developing asthma—251 in total—are depicted here. The font size of each is proportional to the number of publications that have reported its asthma association. Darker colors indicate genes with single nucleotide polymorphisms, or SNPs (pronounced “snips”), that were analyzed by YSPH’s William Murk and colleagues. Whereas most genes are identical from person to person, SNPs vary widely.



Harold Shapiro (3)



A celebration and a call to action.

Yale marked national Food Day with a “Food Day—Food Action!” conference in October that drew dozens of local activists, educators, chefs and policymakers who share a common goal: a healthier New Haven. The event at the Yale Peabody Museum of Natural History formally launched the New Haven Food Action Plan, which seeks to increase access to healthy food, strengthen the local food economy and encourage healthy food choices through education and marketing. U.S. Congresswoman Rosa DeLauro and New Haven Mayor John DeStefano Jr. spoke about accessibility to healthy, safe and nutritious food. Other speakers included YSPH Professor Jeannette Ickovics, director of CARE: Community Alliance for Research and Engagement at the Yale School of Public Health; Tagan Engel, chair of the New Haven Food Policy Council; and Stacy Spell, chair of the West River Neighborhood Services Corp. The evening ended with food prepared by some of New Haven’s best-known chefs.



Give me a Y! A! L! E! Six Yale students show their school spirit in Salvador, Brazil, where they conducted research and participated in a health course last summer. They are, from left to right: Kate Hacker (YSPH), Jake Amatruda (Yale College), Kristine Gauthier (YSPH), Katharine Walter (standing, YSPH), Krysta Peterson (sitting, YSPH) and Kimberly Lay (YSPH).



Presidential picture. Nicholas Torsiello (left), a Ph.D. student at the Yale School of Public Health, poses for a picture with Barack Obama during the president's visit to Stamford and Westport, Conn., last year. Torsiello, who is studying the economic aspects of the Affordable Care Act, served as a volunteer during the visit. He said that shaking the president's hand, which happened very quickly, "leaves you with a nice feeling."



Bright, modern, green. The newly renovated lab space on the seventh floor of LEPH meets LEED (Leadership in Energy and Environmental Design) gold certification standards. Researchers working on malaria, enteric disease and pediatric infectious diseases moved into the new space earlier this year. Labs on the sixth floor were renovated previously.

Speaking of health



Andrij Holian

Microscopic health

Though invisible to the unaided eye, nanomaterials are abundant in many routine products, among them cosmetics, microsensors and medicine, and the minuscule structures will likely become even more widespread with the advent of new applications.

But their rapid development has not allowed their potential health threats to be fully tested or assessed, Andrij Holian, Ph.D., professor of toxicology at the University of Montana, said in a guest lecture in November at the School of Public Health.

Nanomaterials, which measure less than 100 nanometers in length, are manufactured from different substances (including carbon, nickel and gold) and come in a variety of shapes (tubes, spheres and wires). They can be swallowed, inhaled or absorbed through the skin.

While nanomaterials hold great promise, research needs to pinpoint what types are potentially harmful and in what doses and forms, he said.



Chris Beyrer

The toll of AIDS

AIDS continues to take a heavy toll around the world, but it is men who have sex with men who bear much of the disease's burden.

Indeed, the trajectory of AIDS is "markedly higher" among men who have sex with men (MSM) compared to all other populations throughout the world; the disparity is especially high among African-American MSM, and it shows no signs of narrowing.

Chris Beyrer, M.D., a principal investigator at the Johns Hopkins Center for AIDS Research, outlined the state of the epidemic before a capacity audience in LEPH during a Dean's Lecture in November. His talk came two days before World AIDS Day.

"There's a great deal of work to do in this field if we are going to turn this around," said Beyrer.

Part of the explanation is biological: There is a much higher risk (18 times) of transmitting the virus through homosexual sex than through heterosexual sex. This risk is compounded by a number of other social, political and economic factors.



Anne Riederer

The perils of pesticides

Research suggests that exposure to pesticides at an early age, whether in utero or in childhood, appears to have a number of adverse health effects.

Anne Riederer, Sc.D., of the Rollins School of Public Health at Emory University, opened the Spring 2013 semester at the Yale School of Public Health with a discussion of some of the research findings, including a series of studies that examined infants and small children who have been exposed to pesticide-related toxins in vitro and through food, breast milk, formula and household dust.

A pilot study in Thailand showed that pesticides in the urine of young children are present year-round but rise during certain seasons. Researchers also found that in addition to fruits and vegetables, grains contribute the majority of the pesticide burden in one's diet.

Infants show reflex and motor skill deficits, indicative of neurological impairment in the Brazelton assessments performed immediately after delivery, Riederer said.

“The 21st century must be the century of prevention.”

—Peter Boyle



Peter Boyle



Jeannette Ickovics



Pamela Small

21st century challenges

This century is rife with public health challenges, many of which are likely to become more pronounced unless measures are taken to address them.

YSPH adjunct Professor Peter Boyle, Ph.D., D.Sc., during a lecture in October on global public health and the future of epidemiology, outlined some of the looming health, demographic and economic issues that are likely to pose enormous challenges in the coming decades.

“The 21st century must be the century of prevention,” he said. “The time for hoping is past. We need to move into action.”

Tobacco use, for example, continues to be a major source of untimely death and suffering around the world, and it sharply drives up the price of health care as well.

“I would increase the cost of cigarettes 10 percent every three months,” he said. “I would tax the hell out of it. I would price the hell out of it.”

A bigger, heavier nation

As a nation, our bodies have become bigger, heavier.

YSPH Professor Jeannette R. Ickovics, Ph.D., director of CARE: Community Alliance for Research and Engagement, outlined in October some of the ramifications of modern eating habits for public health to an audience at the Yale Peabody Museum of Natural History.

Infectious disease now takes a back seat to chronic disease, not only in the United States, but worldwide. “Not a single organ in the body is unaffected by what we eat,” said Ickovics.

Despite growing portion sizes; the prevalence of sugars, fats and salts in high-caloric, inexpensive food; sophisticated marketing; and communities that are subject to food deserts (scarcity of healthy food) and food swamps (abundance of unhealthy food), Ickovics said she is optimistic that the obesity epidemic can be reversed. But it will require a sustained effort by many people making changes in their daily lives.

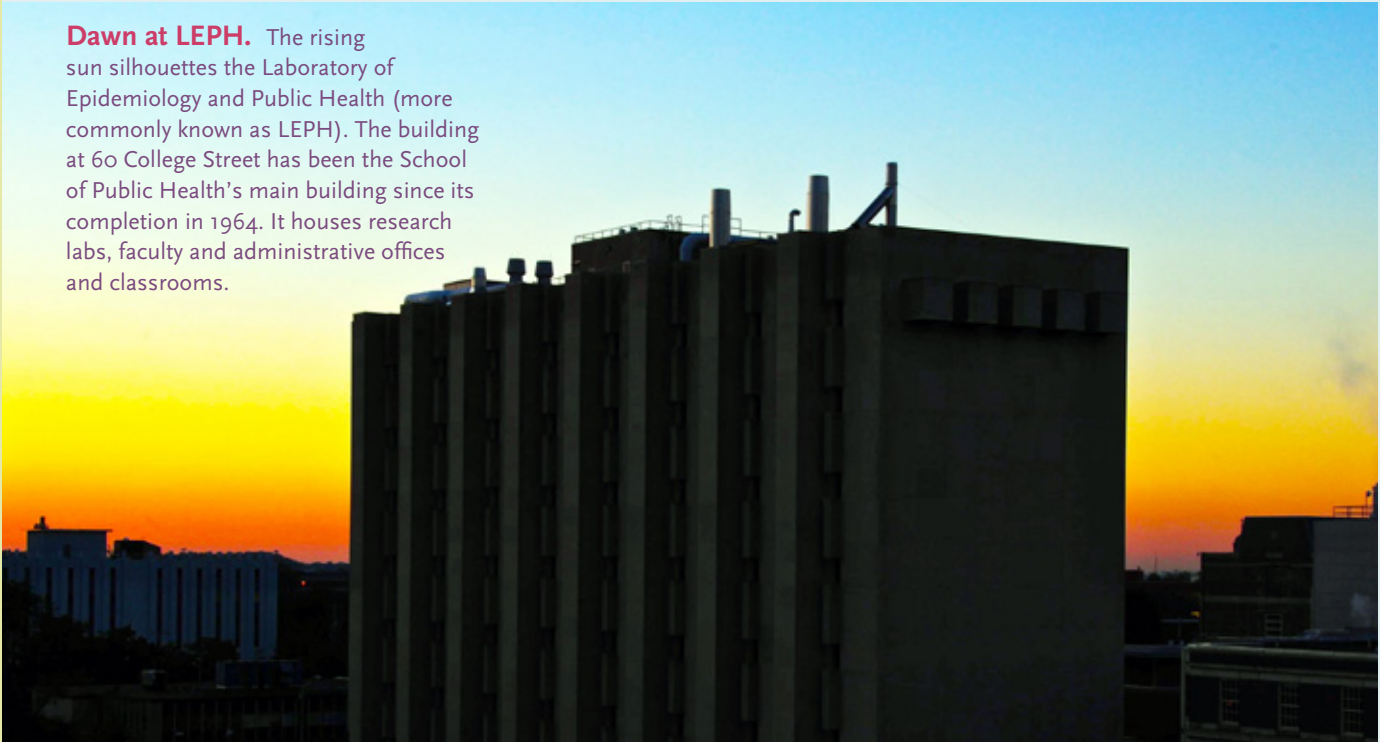
Neglected tropical disease

Buruli ulcer may be a neglected tropical disease, but it is a devastating one that is also an emerging health threat in West Africa. The disease results in debilitating flesh-eating lesions that disfigure the skin.

Buruli ulcer is found mainly in rural, aquatic environments, and people who are at highest risk usually grow rice or make furniture with aquatic palms, said Pamela L.C. Small, Ph.D., professor of microbiology at the University of Tennessee, during a guest lecture in October.

Historically, the disease has been treated with surgery and skin grafts, but since 2005 the World Health Organization has used a long course of antibiotics. Topical heat therapy is also being studied, since the bacteria survive only within a narrow temperature range. Researchers are also still trying to better understand the transmission and incubation of the pathogen, which has been found in many invertebrate species.

Dawn at LEPH. The rising sun silhouettes the Laboratory of Epidemiology and Public Health (more commonly known as LEPH). The building at 60 College Street has been the School of Public Health's main building since its completion in 1964. It houses research labs, faculty and administrative offices and classrooms.



A summer of science. Ten Connecticut middle and high school science teachers slog through woodlands and wetlands in search of tiny quarry: mosquito larvae. The educators were part of a weeklong summer institute in 2012 that studied insect-borne diseases that are expanding into the United States, including dengue fever, Chagas disease and leishmaniasis, and how their ranges are being affected by climate variables. Drawing upon their experiences in the field and the lab, the teachers collaborated on developing a science curriculum to immerse their students in the dynamics of disease transmission and generate interest in the biological sciences. Leonard Munstermann (right), senior research scientist at the Yale School of Public Health, leads the project.



A pretty penny. Close to \$10 billion in new revenue could have been raised with a 1-cent-per-ounce tax on sugar-sweetened beverages in the United States over a 10-month period last year. The revenue clock was activated at the February 9 opening of the *Big Food* exhibition at the Yale Peabody Museum of Natural History and ran continuously through December 2, the exhibition's last day. "Imagine how that money could have been spent to improve school lunches, increase access to fresh fruits and vegetables and support important prevention initiatives," said Jeannette Ickovics, a professor at the Yale School of Public Health, director of CARE: Community Alliance for Research and Engagement and the exhibition's lead curator.

DO YOU WANT TO RECONNECT WITH FELLOW BULLDOGS?
DO YOU WANT TO STAY ON TOP OF WHAT'S HAPPENING AT YALE?



LOOK NO FARTHER THAN YOUR BACKYARD!

Over 120 domestic and 40 international Yale Clubs and Associations help alumni across the globe to connect and expand their horizons.

Yale Clubs provide opportunities for alumni to attend talks by Yale faculty, support civic and community projects and, of course, keep abreast of what is happening at Yale. Several are headed by YSPH alums!

Visit the AYA Club page at:

www.aya.yale.edu/content/clubs

Yale SCHOOL OF PUBLIC HEALTH

Big Food/big impact. The *Big Food: Health, Culture and the Evolution of Eating* exhibition is officially over at the Yale Peabody Museum of Natural History, but its impact lives on. It drew more than 120,000 visitors during its nearly 10-month run, and pledges from many to live healthier lifestyles: 86 percent of students said they would get more exercise and 62 percent vowed they would drink less soda. The exhibition explored the rise of obesity in America and the many factors that are contributing to the country's expanding waistline.

A road less traveled. The condition of the main highways in Liberia makes trade and transport of health, food and other supplies challenging. Margaret Lippitt, a second-year student at the Yale School of Public Health, traveled the dirt road from Monrovia to Zwedru during her 2012 summer internship in Liberia, a trip that took up to 14 hours.



Perspective

Continued from page 9

Unacceptable levels of violence

The public and private victims of violence against women have names and faces. Endless statistics that enumerate the problem can be listed, but doing so would take up too much space and would be preaching to the epidemiologic choir.

Instead let's focus for the moment on real women. We do not know the name of the 23-year-old woman who was gang-raped on a bus in India by six men wielding an iron rod, dying as a result of internal injuries sustained during the attack. And we need not look across the globe to find such horrific examples – Jane Doe in Ohio was just 16 when she was raped by fellow high school students. The rape and aftermath were filmed; photos and discussion quickly filled social media sites, as teenage boys joked about how she must have been dead because she didn't move during the attack and how she “wanted it” anyway.

Add to this short list the women in your own life who have been victims of violence or abuse. Can't think of any? If you know five women, then, statistically, you know a victim, according to the Department of Justice. These women are real, not the fictional characters in the minds of congressmen who make excuses for rape and seek to outlaw abortion. Compare the strength of women who endure these attacks to the cowardice of a Congress that would not vote on the reauthorization of the Violence Against Women Act. Indeed, violence

against women has a name and a face, but will it have an end?

Globally, access to birth control and education will help lift girls and women out of poverty, prostitution and trafficking and allow economic independence to replace dependence on abusive men. At home, we need to educate and empower young women. Men need this, too. They need to reject the notion that it's cool to abuse and shame, and we need a system in which victims receive treatment and perpetrators receive punishment.

Tara Rizzo, M.P.H. '01, research associate, Yale School of Medicine, and former director of research and operations, Susan E. Rosen Women's Health Center, Griffin Hospital.

Alumni Spotlight

Continued from page 36

Looking forward

Rabson, who studied history and music (she plays the French horn) at Brandeis University, became interested in public health in 1980 when, as a recent college graduate working as a paralegal, she needed an emergency operation. Though insured, her portion of the medical bills stunned her. This experience, combined with a few health-related cases she was working on at the law firm, sparked an interest in public health. Her brother, working on his doctorate in virology at Yale, suggested she come to New Haven and study at Yale.

While at Yale, Rabson says, she took every course she could with former

Professor Helen L. Smits, M.D. '67, who came fresh from a policy job in Washington, D.C., and taught that health care resources were limited and should be used wisely.

“Here we are 30 years later, and that message has really not been embraced,” she says. The situation, in fact, is worse now than it was then, “So now, finally, we're dealing with this.”

Rabson graduated from Yale feeling that she was a steward of the public's health. Through her varied experiences, she became known and trusted, which prepared her to lead the health collaborative.

Rabson and her counterparts from Minnesota and Wisconsin will be meeting with the Robert Wood Johnson Foundation this spring to discuss what they have learned and plan their next steps.

“Our joint publications have generated lots of interest, but there needs to be a funding model” going forward, she says. “We have on-the-ground experience and lessons learned. I want to share this with others so that they can do an even better job.”

The MHQP report is available at www.mhqp.org. YPH

Theresa Sullivan Barger is a freelance writer in Canton, Conn.



Harold Shapiro (2)

A high honor. YSPH alumnus Robert Steele was recognized in late 2012 with the Yale Medal, the highest honor bestowed by the Association of Yale Alumni to recognize outstanding individual service to the university. Steele, M.P.H. '71, Ph.D. '75, helped establish the Creed/Patton/Steele Endowed Scholarship, as well as a second scholarship in public health and an internship at the Yale University Art Gallery. During his tenure as president of the school's alumni organization, he established and met a goal of 100 percent giving by the alumni executive committee and also led alumni to consistently meet their giving goals. The association described Steele as "a true and devoted citizen of Yale University."

New partnership formed. Yale School of Public Health Dean Paul Cleary (left), Yale University President Richard Levin (center) and Shanghai Jiao Tong University President Zhang Jie formally launched a new partnership in December with the signing of a memorandum of understanding. The ceremony was the culmination of months of work to create a formal statement of cooperation between the universities. The schools of public health at both institutions are expected to collaborate on upcoming projects.



Awards and honors

Ten YSPH faculty have been named to the 101 Most Influential Professors of Public Health 2012 list on *MPHProgramsList.com*: **Achyuta R. Adhvaryu** (HPM), **Susan H. Busch** (HPM), **Leslie Curry** (HPM), **Elena L. Grigorenko** (CDE), **Josephine J. Hoh** (EHS), **Theodore R. Holford** (BIS), **Amy C. Justice** (HPM), **Becca Levy** (SBS), **A. David Paltiel** (HPM) and **Jody L. Sindelar** (HPM).

Javier Cepeda (Ph.D. candidate), **Ryan Boyko** (Ph.D. candidate) and **Hilary Rogers** (B.A./M.P.H. student) were part of the winning team at Yale's inaugural Global Health Case Competition. The team included three other Yale students: **Bingnan Zhang** (YSM/SOM), **Jordan Slosower** (YSM) and **Yi Zhou** (SOM).

Donna J. Chapman, Ph.D., associate research scientist in the Department of Chronic Disease Epidemiology, and **Rafael Pérez-Escamilla**, Ph.D., professor in the same department and director, Office of Public Health Practice, are the joint recipients of the 2012 Connecticut Breastfeeding Coalition Research and Surveillance Award for "scientific leadership and substantial contribution to our understanding of public health breastfeeding interventions through research."

Adrienne S. Ettinger, M.P.H., Sc.D., assistant professor in the Department of Chronic Disease Epidemiology, has been elected a Fellow of the American College of Epidemiology.

Israel Labao, an M.P.H. student in the Health Care Management Program, received the Foster G. McGaw Graduate Student Scholarship from the American College of Healthcare Executives.

Becca Levy, Ph.D., associate professor and director of the Division of Social and Behavioral Sciences, will receive the 2013 Ewald W. Busse Research Award in June. This is an international award that is given once every four years for research on aging in the social and behavioral sciences.

Linda G. Marc, M.P.H. '92, Sc.D., lecturer in public health, was named by the U.S. Census Bureau to the National Advisory Committee on Racial, Ethnic and Other Populations.

As part of its 50th anniversary, the University of Connecticut Department of Statistics inaugurated the Makuch Visiting Lecture in Statistics. **Robert W. Makuch**, Ph.D. '77, professor in the Department of Biostatistics, delivered a lecture titled "Current Issues in Clinical Trials of Public Health."

Susan T. Mayne, Ph.D., received the Yale Cancer Center Population Science Research Prize for her recent paper, "Indoor Tanning and Risk of Early-Onset Basal Cell Carcinoma," that appeared in the *Journal of the American Academy of Dermatology*. Mayne is the C.-E.A. Winslow Professor of Epidemiology and Public Health and has been associate director for Population Sciences at Yale Cancer Center since 1995.

Reuben Ng, doctoral candidate in the Division of Social and Behavioral Sciences, received the 2012 Tony D. Guzewicz Award for cross-cultural research from the American Psychological Association in October.

Elaine O'Keefe, executive director of the Office of Public Health Practice, has been appointed to the board of directors of the Connecticut Health Foundation.



BBC comes to Yale. British journalist Michael Mosley interviews Becca Levy, associate professor and director of the Division of Social and Behavioral Sciences, in January. The lengthy interview focused on Levy's ongoing research on the attitudes people have about old age and how they affect longevity and health status. Footage will appear on the popular BBC science series *Horizon* and is part of a larger documentary on personality, behavior and emotion. It is scheduled to air later this year. Despite the cold weather, the interview was conducted on the scenic grounds in front of Yale's Sterling Memorial Library.

Advocates for Public Health Student Education Worldwide named **Rafael Pérez-Escamilla**, Ph.D., professor in the Department of Chronic Disease Epidemiology and director of the Office of Public Health Practice, its "Person of the Week" in November.

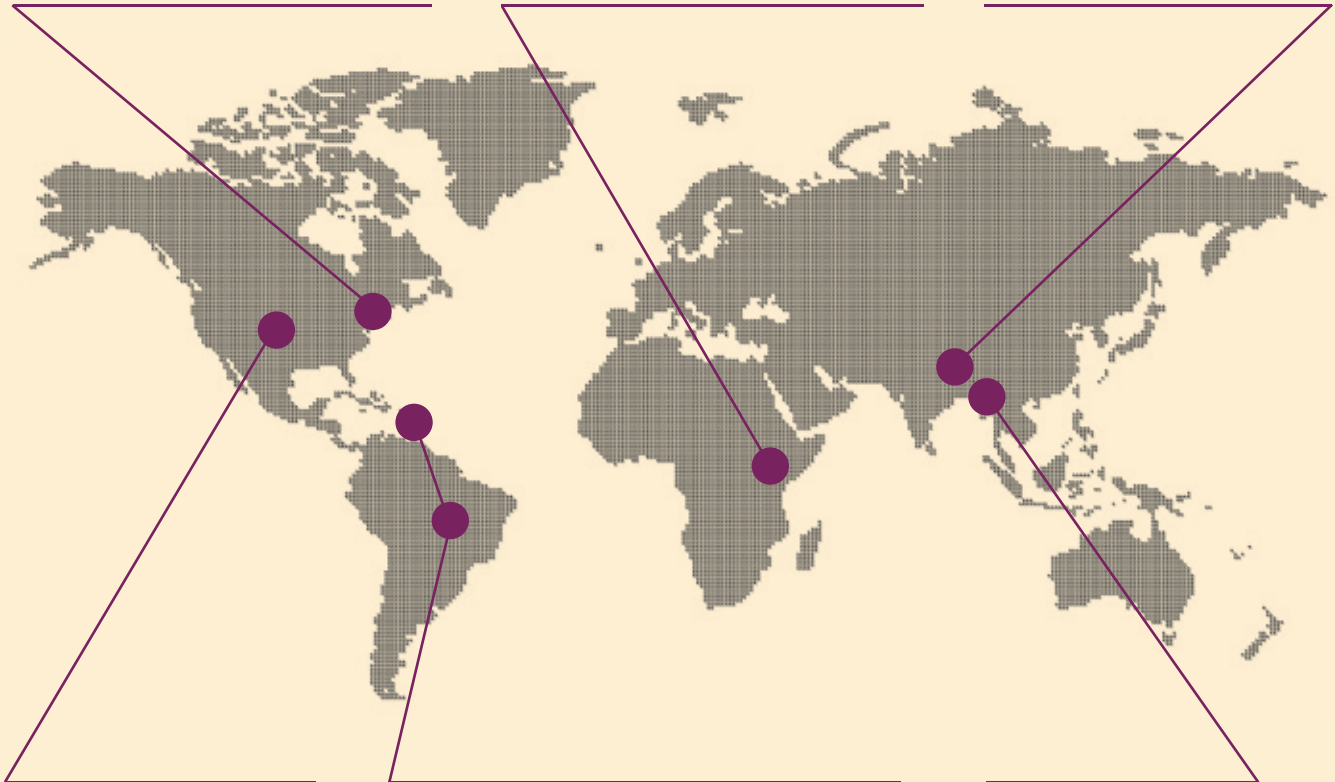
Richard L. Skolnik, M.P.A., lecturer in the Department of Health Policy and Management, has released the second edition of his book, *Global Health 101*. The textbook addresses critical issues in global health, with particular attention to the health-development link in developing countries and to the health needs of poor and disadvantaged people. Skolnik has more than 35 years of experience as a global health practitioner in multilateral, university and nongovernmental organization settings, including the World Bank and the Harvard PEPFAR Program for AIDS.

YSPH around the world

New Haven Interviewers with CARE at the Yale School of Public Health talk with nearly 1,300 New Haven residents in some of the city's most underserved neighborhoods about their health and health concerns. The information will be used to formulate programs and policies to build a healthier city.

Tanzania A doctoral candidate does fieldwork in this eastern African country that results in a scientific paper on the potential for rabies control through dog vaccination in wildlife-abundant communities. The research was published in *PLoS Neglected Tropical Diseases*.

Bhutan As part of an emerging exchange program in which YSPH faculty train Bhutanese health professionals on the Yale campus, faculty from YSPH traveled to Bhutan recently to lecture and explore ways to further strengthen the partnership.



United States Nearly 90 researchers from around the country attend the Yale Climate & Energy Institute's forum in January on the potential health threats posed by warmer temperatures. Several YSPH faculty members helped to organize the event.

Brazil/Trinidad and Tobago For the first time, these South American and Caribbean countries will send delegations to participate in this summer's Global Health Leadership Institute at Yale. The annual conference focuses on devising strategies to address country-specific health care problems.

Thai/Burma border YSPH participates in research that assesses the link between conflict victimization, intimate partner violence within the past year and suicidal ideation among refugee women.

Public health is “the science and art of preventing disease, prolonging life and promoting health. ...”

— C.E.A. Winslow



The C.E.A. Winslow Award was created in 1999 to recognize leading innovators in the public health profession. It is the School of Public Health’s highest honor.

LEADERS IN PUBLIC HEALTH

Centennial C.E.A. Winslow Medal

EDUCATION • PRACTICE • RESEARCH

In conjunction with our 100th anniversary in 2015, the Yale School of Public Health is seeking nominations for world-renowned individuals and/or organizations that have made exceptional contributions to the field of public health. The School will award three medals, one each in education, practice and research. Each recipient will receive a \$10,000 honorarium.



Nominations should be sent to: winslowaward@yale.edu

Yale SCHOOL OF PUBLIC HEALTH

Yale University
60 College Street
P.O. Box 208034
New Haven, CT 06520-8034

publichealth.yale.edu



New Life for Old YSPH Photos



The Yale School of Public Health is approaching its Centennial in 2015 and we are looking to our alumni and to past and present faculty and friends for pictures that help illustrate the rich history of public health at Yale.

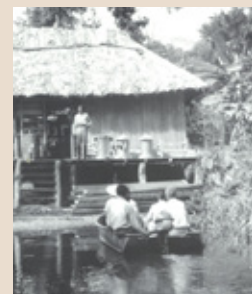
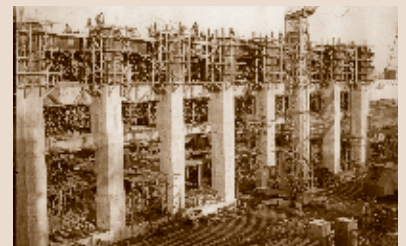
All images from your time at YSPH, whether in print or digital format, are welcome.

Images may be used in a variety of Centennial-related projects, including an anniversary book, Centennial video, slideshows, social media albums and Web-based presentations. Any image used will be credited to the owner/photographer.

Contact Michael Greenwood at (203) 737-5151 or michael.greenwood@yale.edu to discuss your photos and possible contributions.

Yale SCHOOL OF PUBLIC HEALTH

1900s 1910s 1920s 1930s 1940s 1950s 1960s 1970s 1980s 1990s 2000s 2010s



In Memoriam

Margaret Joralemon Albrink, M.S. '43, M.D. '46, M.P.H. '51, died at Ruby Memorial Hospital in Morgantown, W.V., on December 23. Margaret was one of the few women of her generation to pursue a career in academic medicine and is noted as the first researcher to establish the significance of serum triglycerides in coronary artery disease. She developed her theories based on her extensive research at Yale and later at West Virginia University and held fast to her view despite a prevailing belief that cholesterol was the primary risk factor for heart disease. Over the years her theories were verified, and they are now accepted by the wider scientific community. She had a long and distinguished career as a researcher, teacher and clinician. Margaret will be remembered not only for her lipid research and for her participation in numerous medical and scientific organizations, but also as a devoted and caring physician for the many patients she treated over the years.

Ida May Bucher, M.P.H. '50, died on September 30 at the age of 94. Ida attended Smith College, where she majored in child development. She continued her studies at Harvard University in 1939 at the School of Education and completed a Massachusetts Teaching Credential in 1940. She worked as an elementary school teacher before studying for her M.P.H. at Yale, where she met her husband of 58 years, Bill, who was a medical student. Ida and Bill raised five children and lived in eight cities before they settled in Los Angeles in 1957. Ida worked as a research associate for the Children's Home Society Adoption

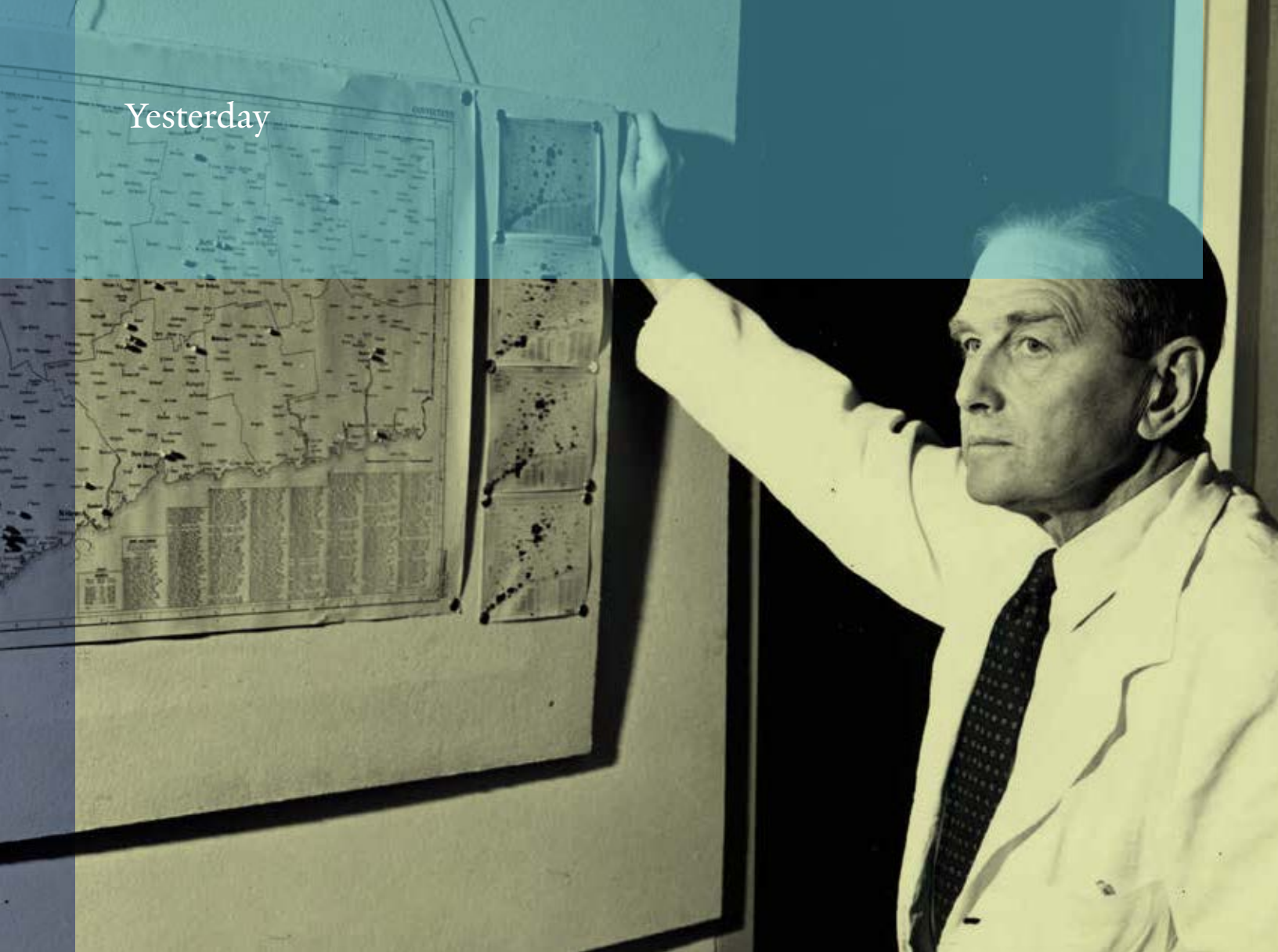
Agency and in 1963 became director of the preschool and parent education projects of the Neumeier Foundation in Venice, Calif. This project was a forerunner to the Johnson Administration's War on Poverty. Ida became coordinator of Operation Head Start for West Los Angeles County and then director of the First Presbyterian Church Nursery School of Santa Monica, a position she held until 1984. Ida was also an instructor of child development and parent education at Santa Monica College from 1969 to 1985. Ida co-authored many books on day care with Docia Zavitkovsky and Betsy Hiteshew and collaborated on the popular Santa Monica College instructional television show, *Time to Grow*. She was active in public policy and helped to found Child Care Information Services of Santa Monica.

Marie L. Dargan Dunham, M.P.H. '73, died on September 6. A resident of East Orange, N.J., for more than 30 years, Marie majored in English at Lincoln University and then received her master's degree from the Yale School of Public Health. Marie was a project specialist supervisor in the pediatrics department of the University of Medicine and Dentistry of New Jersey.

Alice Stark, M.P.H. '73, Ph.D. '80, of Loudonville, N.Y., died on August 9 at the age of 71 after a struggle with multiple sclerosis. Born in the Bronx, Alice was a graduate of CCNY, where she earned her bachelor's in chemistry and later received her master's and doctoral degrees in epidemiology from Yale. She was a professional epidemiologist and served as a bureau director for the New York State Health Department.

Send obituary notices to
ysph.alumni@yale.edu

Yesterday



Early epidemiology

John Rodman Paul, a professor of internal medicine, joined the faculty in 1928 and later headed the new Section of Preventive Medicine. In addition to contributions to the study of rheumatic fever, infectious mononucleosis and hepatitis, he is known for his work on poliomyelitis and developing novel “clinical epidemiology” methods.

In 1931, along with James D. Trask, Paul established the Yale Poliomyelitis Study Unit. After prominent studies in Middletown and New Haven in the early 1930s, they were asked to consult on outbreaks in cities throughout the United States, which provided a wealth of data. They demonstrated that the poliovirus not only was found in the throat and intestinal tract but also was present in sewage and in the flies that feed on feces, explaining the prevalence of summertime epidemics.

During World War II, Paul was director of the Commission on Neurotropic Virus Diseases of the Army Epidemiological Board and was able to further the work through studies of U.S. troops stationed in the Pacific and the Far East. After the war, it was observed that children who experienced poliovirus infections and had antibodies before the age of 2 became virtually immune – a key discovery that led to a serological vaccination.

The Yale University Press published Paul’s *A History of Poliomyelitis* shortly before his death in 1971.

Today, endemic polio remains only in Afghanistan, Nigeria and Pakistan. The virus has re-established transmission in three countries that were previously polio-free – Angola, Chad and Democratic Republic of the Congo.

Denise Meyer

Today



One door, one resident at a time

Paladin “Earl” Harris (left) and Chelsie White went door-to-door in mid-September in New Haven’s most underserved neighborhoods to interview residents about their current health and health concerns.

The weeks-long survey, conducted by CARE: Community Alliance for Research and Engagement at the Yale School of Public Health, deployed 20 trained interviewers who collected data from nearly 1,300 randomly selected residents. The results are being used to devise strategies that promote healthier lifestyles through diet and exercise. The goal is to improve individual health and, by doing so, to improve the overall health of New Haven. A similar survey was done in 2009.

Participants answered a range of questions about their personal health practices, current health problems and factors within their neighborhood, such as concerns about personal safety and the availability of recreational resources and healthy food, that affect their well-being.

The survey revealed some encouraging news: 42 percent of residents said that improvements to their neighborhood over the past three years had made it easier for them to pursue a healthier lifestyle. But there are obstacles as well. Many respondents “strongly” or “somewhat” agreed that they feel unsafe going for walks in their neighborhood. This is of significance, since concerns about personal safety may limit exercise options.

Michael Greenwood

Yale Public Health
60 College Street
P.O. Box 208034
New Haven, CT 06520-8034

Non-Profit
U.S. Postage
PAID
New Haven, CT
Permit No. 526



STAY INVOLVED AND CONNECTED

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

Stay informed about your school

Join the YSPH LinkedIn group: With nearly 700 members, our LinkedIn group is fast becoming the preferred way to network with friends and colleagues.

Like us on Facebook: With daily updates on research, faculty, students and alumni, our Facebook page is the place to go for the latest YSPH and public health news.

View us on Pinterest: A picture is worth a thousand words, and we have lots of great images.

Follow us on Twitter: Join over 1,000 followers and get YSPH news in real time!

Watch us on YouTube: Engaging, informative stories and lectures—learn something new today.

Visit our website: The entryway for all things Yale School of Public Health. Read the digital edition of *Yale Public Health* and help to save trees.

Receive @YSPH, your alumni e-newsletter: For news, happenings, social events and more.

For additional information on these and other opportunities, visit publichealth.yale.edu/alumni/services/index.aspx

