

# HARVARD PUBLIC HEALTH

Spring 2014

## Failing Economy, Failing Health





# Questions of Scale

In science, we often talk about scalability: Can an idea or program or technical innovation that has solved a problem in a small and controlled setting be amplified and applied to the complex and contradictory realities of human life? Reading this issue of *Harvard Public Health*, I am struck by the innate scalability of the public health impulse. Fueled by empathy towards those who suffer and intolerance against injustice, we search for ways to sensitize and inform governments and societies, in order to forge policies that reduce the chances of personal calamity. We move easily from small to large to small, from the individual to the institutional and back to the human being.

Our cover story about the health impacts of the Great Recession of 2007–2009 exemplifies this scalability. As HSPH researchers and others describe, the massive wave of joblessness and foreclosures that began in 2008 has exacted an incalculable cost in physical health and psychological well-being in the U.S. and around the world. This is not an abstraction. When stock markets plummet and mortgages go into default, heart disease and chronic illnesses and emotional distress inevitably rise—in some people, irreversibly.

The magazine's profile of Ashish Jha portrays a physician/hospital safety advocate/prolific blogger who has brilliantly translated the personal into policy,

and policy into the personal, drawing on both his observations as an internist and on his experiences as a patient.

Perhaps the most literal and surprising example of public health's scalability is seen in the story on HSPH's nanotechnology and nanotoxicology effort, led by Philip Demokritou. At the NanoCenter, our scientists have engineered infinitesimally small nanodroplets of water that may someday be deployed as invisible mists, shielding us against some of the most deadly airborne infectious threats to humankind.

The notion of scalability, of course, is central to the School's ambition of solving public health challenges "from the genes to the globe." We are committed to addressing complex problems by integrating levels of analysis and academic disciplines. In public health, it's our job to see the big in the small, the universal in the particular.

Julio Frenk  
Dean of the Faculty and  
T & G Angelopoulos Professor of Public Health  
and International Development,  
Harvard School of Public Health

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### Failing Economy— Failing Health

It is five years since the Great Recession officially came to an end. Will the long-term damage to our health far exceed the damage to our economy?



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*Illustration by Daniel Hertzberg*



## WIDOWHOOD CAN BE DANGEROUS TO YOUR HEALTH

**T**he popularly termed “widowhood effect” leaves a surviving spouse 66 percent more likely to die in the first three months after the death of a partner. The finding comes from new research led by HSPH, based on data from the U.S. Health and Retirement Study and published in the *Journal of Public Health*. The study’s senior author, SV Subramanian, professor of population health and geography in the Department of Social and Behavioral Sciences, offers some explanations: “It’s possible it’s a grief-related mechanism, or that providing care for the sick spouse causes illness in the surviving spouse, or that, as one’s spouse gets sicker, the surviving spouse stops taking care of his or her own health.”

## Bile Acid Treatment Could Prevent Type 1 Diabetes

**A**naturally occurring bile acid can target a cellular stress mechanism in type 1 diabetes, according to a new study led by Harvard School of Public Health. In a surprising finding, treatment with the bile acid prevented the disease in mouse models. Senior author Gökhan S. Hotamisligil, chair of the Department of Genetics and Complex Diseases, explains that such molecules could someday be used to “keep those at risk for type 1 diabetes disease-free for long periods of time, or even prevent the disease altogether.” The study appeared in *Science Translational*.

**HEALTH REFORM  
WATCH**



REUTERS

HARVARD  
SCHOOL OF PUBLIC HEALTH

FORUM

## KEEPING UP WITH HEALTH CARE REFORM

HSPH, in collaboration with the news organization Reuters, is now offering regular updates on the status of the Affordable Care Act and its influence on health care in the U.S.

Catch the new web-based program “Health Reform Watch” at [hsph.me/health-reform-watch](http://hsph.me/health-reform-watch).

## Translating the Talk between Liver and Muscle

Research conducted jointly by HSPH, Brigham and Women's Hospital, and Harvard University's Faculty of Arts and Sciences has revealed a novel mechanism that controls how fat-making in the liver communicates with fat-burning in skeletal muscle. "This finding uncovers a joint effort of the liver and muscle to maintain balanced fat production and burning—a biological process tailored to match the body's energy demands and maximize fuel-burning efficiencies during the day versus night," says Chih-Hao Lee, senior author and associate professor of genetics and complex diseases. The researchers hope that the study, which was published in *Nature*, generates greater understanding of normal metabolism in liver and muscle and paves the way for new therapies to treat fatty liver, obesity, and diabetes.

## Could 2035 be the last year of global health disparities?



Can world health disparities disappear within two decades? A major new report in *The Lancet* details an investment plan through which governments and private donors could reduce infectious, maternal, and child deaths in all countries to the levels of the best-performing countries in a single generation. The report, "Global Health 2035: A World Converging within a Generation,"

projects that if its recommendations are followed, about 10 million lives could be saved by 2035 in low- and middle-income countries. Two of the report's authors are from Harvard School of Public Health—HSPH Dean Julio Frenk and Sue J. Goldie, the School's Roger Irving Lee Professor of Public Health and director of the Harvard Global Health Institute. "[G]ood investments in health are good in themselves, but they also promote economic growth," Frenk told the *Harvard Gazette*. "The main idea is that by 2035, we can achieve what's called a grand convergence, closing the most egregious equity gaps we still have between poor and rich populations around the world."

## Sick Ecosystem = Sick People

Apocalyptic forest fires. Melting ice caps. Dammed rivers. Dwindling animal and plant habitats. Humans' alterations of the earth's natural systems pose grave risks to human health—especially among the world's poor, who are singularly vulnerable to the health impacts that result from degraded natural systems. Samuel Myers, research scientist in HSPH's Department of Environmental Health, and his colleagues in the HEAL (Health & Ecosystems: Analysis of Linkages) consortium have proposed a new health research framework that focuses on the health effects of environmental changes. In a perspective paper in the *Proceedings of the National Academy of Sciences*, the authors argue that such research can inform future policymaking for land use, resource allocation, and public health.



**LEARN MORE ONLINE** Visit *Harvard Public Health* online at <http://hsph.me/frontlines> for links to press releases, news reports, videos, and the original research studies behind Frontlines stories.

# Sounding the Alarm on Human Rights Abuses, Discrimination



A recent report by Siddharth Kara, a fellow with the François-Xavier Bagnoud (FXB) Center for Health and Human Rights, reveals pervasive human rights abuses in India's carpet industry. The report, *Tainted Carpets: Slavery and Child Labor in India's Hand-Made Carpet Sector*, describes illegal forced labor practices in production sites belonging to 172 carpet exporters. "[T]he working conditions uncovered were nothing short of subhuman," the report notes, pointedly contradicting claims that slavery and child labor have been eliminated from the sector.

A second report by the FXB Center, *Accelerating Patterns of Anti-Roma*

*Violence in Hungary*, alerts the United Nations and the international community to persistent patterns of violent attacks and actions against the Roma (pejoratively called Gypsies). It argues that Hungary's mounting incidence of hate crimes, racist propaganda, discrimination, and exclusionary ideologies demands measures to ensure the physical and psychological safety of the Roma and other minority groups.

## STEMMING THE TIDE OF DIABETES IN ASIA

**T**

he Asian Diabetes Prevention Initiative website—launched as a joint initiative between the Harvard School of Public Health Department of Nutrition

and the Saw Swee Hock School of Public Health at the National University of Singapore—aims to give health professionals, public health practitioners, and the public quick and easy access to science-based information. The website serves as a factual resource about the causes of type 2 diabetes, its health consequences, and what can and must be done to decrease the prevalence of this disease on the world's most populous continent.

For more information visit  
[www.asiandiabetesprevention.org](http://www.asiandiabetesprevention.org)

**Asian Diabetes Prevention Initiative**

A Joint Initiative of **HARVARD SCHOOL OF PUBLIC HEALTH** Department of Nutrition and **NUS Saw Swee Hock School of Public Health**

What Is Diabetes? Causes Of Diabetes Prevention About Us **AM I AT RISK?**

**Caring For Your Family**

Avoid the alarming consequences of diabetes.

Read about diabetes in Asians and the best ways to prevent it from taking over your life.

**Prevent Now!**

What are you looking for?

**Introduction**

The rapidly emerging diabetes epidemic in Asia has the potential to overwhelm health care systems, undermine economic growth, and inflict unprecedented levels of disability on the world's most populous continent. We aim to put a stop to this deadly epidemic by offering Asian countries authoritative, science-based information to stop the spread of type 2 diabetes.

**Did You Know?**

**500 MILLION PEOPLE** IN CHINA & INDIA COULD SUFFER FROM DIABETES BY 2030

**Diabetes In Asia**

**INDIA** 65.1 Million **CHINA** 113.9 Million

**Why are Asians at higher risk?**

**Changes in your diet and lifestyle can help reduce your risk of type 2 diabetes.**



## THE \$1.50 DIFFERENCE

**DARIUSH MOZAFFARIAN**  
ASSOCIATE PROFESSOR  
IN THE DEPARTMENT  
OF EPIDEMIOLOGY

In a recent study, you found that the cost per person of a healthy diet was \$1.50 more per day—\$550 more per year—than the cost of an unhealthy diet. What are the policy implications of this dollar calculation?

“ For the majority of Americans, this is the cost of a daily cup of coffee. For 30 to 40 percent of low-income Americans—including more than 40 million people on the SNAP, or food stamp, program, and many more who are having trouble making ends meet—\$550 per year, or \$2,200 for a family of four, is a pretty big barrier to healthy eating. Yet even for these individuals, the cost is far less than the cost of treating chronic diseases.

For decades, we’ve been telling people to eat healthier. But the effects have been negligible. Instead, we need strong policies in government, schools, workplaces, and communities to influence diet. For example, based on the evidence, it is clear that we should tax unhealthy foods and subsidize healthy foods. Unhealthy foods include processed, rapidly digested foods, such as sugary beverages, refined carbohydrates, and processed meats. Healthy foods include minimally processed fruits, vegetables, fish, nuts, whole grains, beans, and vegetable oils.

Over the last several decades, most of the public health focus has been on taking out unhealthy foods. Yet, we haven’t focused enough on increasing healthy foods. This highlights the advantage of taxing unhealthy foods and simultaneously subsidizing healthy foods. If one only taxes unhealthy products, it can be seen as regressive and hurting the poorest people. But if one also subsidizes healthy foods, then we can actually promote a healthy diet for everyone, without additional expense.

The most direct approach would be enacting policy at the federal level. Updating SNAP so that only healthier foods can be purchased, preferably at a discount, would be transformative for many Americans. Other options could include a subsidy for farmers to grow healthy foods, for food manufacturers and restaurants to buy wholesome ingredients, or for supermarket customers to buy nutritious items. For taxing unhealthy foods, one needs at least a 10 percent boost in price to create a meaningful change in intake. We know from taxing tobacco and alcohol that the higher the tax—20 percent, 30 percent—the better. That’s important to recognize, because diet has replaced smoking as the single biggest modifiable cause of disease in the U.S. and around the world. ”

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## “JUST” GIFTS



Ellie Starr

One of the preoccupying challenges in ensuring the public's health is the growing divide between rich and poor. This problem is portrayed vividly in our cover story about the devastating consequences on mind and body of the Great Recession of 2007–2009—adverse effects that are worsened by income inequality.

Unfortunately, at the very moment when public health research is most needed to tackle these challenges, there is less government funding for such research. It's no coincidence that there's also a shrinking pool of young women and men who can afford to enter the field of public health, because the profession is comparatively less remunerative.

How can we close these gaps? One of the best ways is through enlightened philanthropy. That's why I am so inspired by the many contributors who have strengthened our research, teaching, and learning at Harvard School of Public Health. Through gifts large and small, our contributors not only fund research but also make it possible for students who are passionate about making things better around the world to study with our School's preeminent faculty.

Philanthropy is the tool that can balance the scales of justice—so that every human being can enjoy a healthy life, with all its possibilities. Thank you so much for your generosity.

A handwritten signature in cursive script that reads "Ellie Starr".

Ellie Starr,  
Vice Dean for External Relations

## Innovation and Future

A new \$5 million, five-year gift to HSPH from Matthew and Monika McLennan will fund promising initiatives or research that is novel or experimental and not yet able to win traditional grant funding. The goal, says Matthew McLennan, is to “really move the dial” in terms of health impact, and to inspire others to give similar gifts.

The new gift establishes the McLennan Family Fund for Innovation and Entrepreneurship, which will expand discretionary resources for HSPH Dean Julio Frenk and future deans. Half of the gift will go to the Dean's Fund for Innovation, where it will enable deans to allot funds quickly for fast-moving opportunities or for promising research that requires seed or bridge funding. The other half will help launch a new Dean's Challenge Grant Program to support faculty working on innovative solutions to global health challenges.

“Monika and I think this is a powerful form of funding, particularly in a world where NIH [National Institutes of Health] funding, and funding as a whole, is hard to get,” says Matthew McLennan, who heads the Global Value team at First Eagle Investment Management. Adds Monika McLennan, “We also hope to inspire others to contribute to the efforts of the School.”

“This generous gift from Matthew and Monika McLennan represents an extremely important form of support because of its unrestricted nature,” says Dean Frenk. “The gift will allow me, and future deans of the School, to move nimbly in providing funds for promising new lines of research or ideas that might simply be too new or too unproven to win grants from federal agencies or private organizations, but that could have a huge impact on improving the health of people around the globe.”

Matthew McLennan cites the fight against malaria as a good example of why he and his wife chose to give unrestricted funding to HSPH.

“Fighting malaria isn't about just providing a pill,” he says. “It's about a whole system of figuring out how

# Funding Get a Jump-Start from McLennan Gift

to get people to take a pill. You have to consider financing and transportation networks and who's going to deliver the pill. You have to think about incentive schemes to get communities to use mosquito nets. Problems like these require systemic solutions, and if one small part of that solution is missing, it can cause a problem. Monika and I feel that by giving the Dean the flexibility to target funds where they're most needed—to whatever the missing pieces are in systemic

**“Our big-picture goal is to change the whole pattern of public health research funding—to shift the focus from funding only proven ideas to funding early-stage ideas.”**

*—Matthew McLennan*

solutions to complex problems—it will lead to the biggest positive impact from our investment.”

McLennan says the gift is intended to give new ideas at HSPH a chance to bloom, making it more likely they'll win traditional grant funding farther on. He also hopes to inspire others to provide similar support. “If we plant a number of different seeds and a handful take root and provide game-changing solutions to public health problems, it might spur others to give unrestricted funds like this to fund innovative research,” he says. “Our big-picture goal is to change the whole pattern of public health research funding—to shift the focus from funding only proven ideas to funding early-stage ideas.”

“Harvard School of Public Health is filled with extraordinary people,” says Monika McLennan. “The professors and alumni have played a role in so many important initiatives—fighting polio, eradicating smallpox, pushing for cleaner air, working to prevent cancer, trying to make health care more cost-effective. Matthew and I have thought long and hard about what actions we can take to provide a better future for



Monika and Matthew McLennan

the world, and the School's many achievements compelled us to be part of this very important work.”

The McLennans' connection with HSPH spans the past decade, through the administrations of both Dean Frenk and former Dean Barry Bloom. Members of the Board of Dean's Advisors and the Leadership Council Executive Committee, they previously established a student fellowship fund and gave to the Dean's Fund for Innovation and the Annual Fund.

“Every time I interact with faculty, staff, and students at HSPH, I learn of new aspects of the School that catch me by surprise and intrigue me,” says Monika McLennan. “It is such a pleasure to see the extraordinary nurturing from talented faculty members that inspires students to reach tremendous heights and never to give up on their dreams, and often to assume leadership roles across the world. Matthew and I are so proud to be part of HSPH's extraordinary effort to improve the global future of the next generation.”

# Ferrante Gift Boosts “Outside-the-Box” Thinking

Among the outside-the-box efforts that may benefit from a new \$500,000 gift from Domenic and Molly Ferrante to the Harvard Humanitarian Initiative (HHI):

- *Collecting, analyzing, and distributing large data sets to provide time-sensitive information on humanitarian issues—painting a picture, for example, of how displaced populations are faring in the wake of a natural disaster.*
- *Facilitating the scale-up of a hand-held data collection system that allows humanitarian workers to share information as crises unfold—such as during a disease outbreak.*
- *Using satellite technology to help understand fast-moving events with public health implications—such as troop movements in a war-torn country.*



Harvard Humanitarian Initiative staff at a field hospital after the 2010 earthquake in Haiti

Thanks to the Ferrantes' gift—their second to HHI—these and other potentially high-impact efforts will get a crucial boost. The Dom and Molly Ferrante Humanitarian Innovation Fund will make possible novel technologies in humanitarian response efforts, creative collaborations in the humanitarian realm, and models of how best to quantify the impact of humanitarian work.

HHI Director Michael VanRooyen calls the Ferrantes' funding “extremely valuable.” Because the gift isn't tied to a particular program or initiative, it can be used for untested ideas that require support but are unlikely to win traditional grant funding. “By our very nature, our organization is on the leading edge of humanitarian relief,” VanRooyen says. “There are many things we see that need to be done that are not fundable—at least not yet. This support is valuable because it will allow us to develop and test new and creative ideas.”

“Mike [VanRooyen] is an innovator,” says Dom Ferrante, MBA '93, managing partner of The Ferrante Group. “His work has been groundbreaking, bringing to the humanitarian field a high level of metrics, measurement, process orientation, and an emphasis on leveraging technology. We wanted to give unrestricted money to help him and his team push one or two innovative ideas over the goal line in the next 5 or 10 years.” The HHI gift, Ferrante says, has the potential “to impact a large number of people in a positive way.” \

# Gift from Alumna Swati Piramal and Family Inspires New HSPH-India Collaborations

Thanks to a generous gift from Dr. Swati Piramal, MPH '92, and her husband, Ajay, HSPH will open a research and training center in the center of Mumbai that will facilitate the School's longstanding collaborations in India and launch important new projects in the future.

Piramal's hope is that the new gift of office space and substantial funding will strengthen HSPH's efforts to improve health care in India in the many areas where it lags behind. She envisions an India "where a mother does not have to worry if her child will survive; where she has the strength to both look after her children and contribute to the country's economy; where she doesn't have to trudge miles to get simple health care; where she can determine the size of her family; where she can keep her family safe from disease; where she can look forward with a positive outlook for her future; and where she can dream of being healthy and strong."

Kasisomayajula "Vish" Viswanath, professor of health communication at HSPH, who will lead the new center, calls the gift from the Piramals "transformative."

"Having this new space in Mumbai will provide HSPH with a platform to facilitate and stimulate the School's activities in Mumbai and throughout India," he says. "Our hope and vision is that having a physical presence there will support our work in many areas, including research, training, and translation and communication around public health issues."

HSPH's ongoing work in India includes projects in primary health care delivery, child labor trafficking, the welfare of the elderly, maternal and child health, and tobacco cessation. Viswanath expects the new center to spur a



Dr. Swati Piramal, MPH '92

wide range of School activities—such as providing training for would-be public health leaders, running workshops on various public health subjects, and providing a home base for students doing research or internships in India.

Piramal is one of India's leading scientists and industrialists. She is vice chairperson of Piramal Enterprises, a multinational business that encompasses the health care, drug discovery, and research industries. As director of the Piramal Foundation, she helps promote health in rural India. She also serves on HSPH's Board of Dean's Advisors, is a member of Harvard's Board of Overseers, and received an Alumni Award of Merit from HSPH in 2012.

Says Piramal, "HSPH has vast global experience that can bring both technology and skills to find innovative solutions for India's health care needs. With the help of HSPH, we will be able to make an impact for millions of people—not only in India, but around the world."

“To gain the kinds of improvements in human health experienced during the last 50 years, we will have to focus more on the creative, effective, caring implementation of what we already know.”



# Quote/Unquote

## How do you envision the next 50 years of public health?

**Rebecca Hope, MPH '14, told a gathering earlier this year how she imagines the future of public health unfolding. Her remarks, excerpted here, come from Harvard School of Public Health's installation of a time capsule in the lobby wall of the FXB building as part of the School's Centennial. The time capsule will be opened in 2063. [Learn more at \*hsph.me/timecapsule\*](http://hsph.me/timecapsule).**




When I think about the last 50 years in health, I think of my grandfather. He contracted polio as a child and spent almost a year in Liverpool [England] City Hospital. Despite being told he would never walk again, he went on to run marathons. It seems unbelievable that a disease now on the verge of being eradicated was a real fear for so many families.

As Dean Frenk reminds us, the average life expectancy during the 20th century increased by 30 years in the U.S., with 25 years of that increase due to improvements in public health. Thanks to work over the last 50 years by incredible scientific minds—many working here under this roof—there are far fewer diseases for which we lack the right treatments and prevention strategies. Today, our real and pressing challenge is to find ways to improve access to these treasures. To gain the kinds of improvements in human health experienced during the last 50 years, we will have to focus more on the creative, effective, caring implementation of what we already know.

There is one remarkable asset needed to achieve this: people. What will save the most lives in the next 50 years is the daily service of people—people like you, imaginatively deployed to prevent human suffering. Volunteer health workers who travel across muddy roads to deliver health care to their communities. Nurses and doctors effectively delivering the right level of care, not the type of care that pays them the most money. The volunteer on the end of the phone, talking to someone who feels desperate. It will be human kindness, brilliantly channeled, that will continue to improve the health of millions over the next 50 years.

What is most impressive about the class of 2014 at HSPH is their motivation and aptitude to lead through their service. Students here are serving women in rural Kenya who need better access to medical care. They are using technology to train doctors in Palestine across geographical and political borders. They are coordinating health care for refugee populations from Syria. There are dengue scientists, health systems analysts, statisticians, future ministers of health, gender experts, economists, surgeons and pediatricians, innovators in technology and mHealth, dedicated health workers and humanitarians.

Like the world, HSPH will be different in 2063. But what won't change is the essential character of the students, faculty, and staff at HSPH. This will continue to be a place of brilliance—where smart, diverse, and engaged students and faculty can build friendships into partnerships, turn ideas into solutions, and put passion into practice. The passion, intelligence, and dedication collected in this room today make me believe that this is a very achievable goal. 

**Rebecca Hope is a British-trained pediatrician with research experience in HIV epidemiology in adolescents, maternal and child health, and microfinance in resource-poor settings.**



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17K @ 25.88 ↓1.75  
1.2M @ 92.3 ↓4.87  
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8.7M @ 102.28 ↓.59  
88.5K @ 127.94 ↓10.2  
2.2M @ 17.44 ↓.66  
14.4K @ 76.2 ↓1.19  
175K @ 48.77 ↓2.12  
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OTHER  
NERING MOTORS  
GENETIC  
STANDARD CORPORATIONS  
MONITORING

Five years after the Great Recession officially came to an end, the United States has yet to fully recover from the economic devastation sparked by the collapse of an \$8 trillion housing bubble and the ensuing turmoil that saw global financial systems teetering on the brink of collapse. But while the economic costs of the downturn have drawn the lion's share of attention, the damage to our bodies could end up far surpassing the damage to our bank accounts.

# Failing Economy, Failing HEALTH

## THE GREAT RECESSION'S TOLL ON BODY AND MIND

"It's quite stunning we haven't been hearing more about this," says Kasisomayajula "Vish" Viswanath, professor of health communication at Harvard School of Public Health. "We talk about poverty and inequality resulting from the recession, but we do not take the next step. We do not extend that logic to the effects on health."

If the issue is largely invisible in the nation's news outlets, it is drawing the attention of a growing number of public health researchers, some of whom are beginning to identify possible links between the Great Recession—the worst economic downturn in the U.S. since the Great Depression of the 1930s—and a growing list of physical and mental health ills, from heart attacks to obesity to depression. In addition to cataloging the health harms resulting directly from stress [see sidebar: "The Biology of Chronic Stress," p. 16], many studies suggest that economic pressures may also give rise to a host of unhealthy behaviors—such as bingeing on sugary or high-fat comfort foods, smoking, and drinking to escape worries—as well as to widening economic disparities, which exact a documented toll on people's health.

*continued*



Joblessness, the foreclosure crisis, the growing gap between rich and poor: these are not solely economic issues. Yet the full tally of public health costs linked to the Great Recession—at levels ranging from our cells to our health care systems—will not be apparent for many years. “Health is a long-run thing, but the methods we use to analyze current data only estimate short-term effects,” says SV Subramanian, HSPH professor of population health and geography. “It may take awhile for the health impact of the Great Recession to kick in, but once it does, it could be dramatic.”

### HOW UNEMPLOYMENT MAKES US SICK

There has long been substantial evidence linking job loss to shorter lives and more health-related problems. A 2009 study on the impact of the 1980s oil crisis and subsequent recession in Pennsylvania, published by economists Daniel Sullivan and Till von Wachter in the *Quarterly Journal of Economics*, found that in the year after men lost their jobs in mass layoffs, their chances of dying doubled. And though the

heightened risk tapered off over the years, it was still significantly higher 20 years later. If such trends were sustained indefinitely, the authors wrote, it would mean a loss in life expectancy of 1–1.5 years for a worker displaced at age 40.

Today, a new generation of researchers is building on this scientific foundation. Sociologist Clemens Noelke, David E. Bell Postdoctoral Fellow at the Harvard Center for Population and Development Studies (Pop Center), is in the final stretch of a study of the health impact of job loss during recessions and the extent to which unemployment benefits may cushion potential harms. Noelke’s research, which draws on data from a massive biannual study, focuses on U.S. workers ages 50 and older between 1992 and 2010—years that include the downturns of the early 1990s and the early 2000s, as well as the Great Recession (2007–2009). Among the health indicators he is looking at: mortality rates, cardiovascular disease, cognition, depression, and unhealthy behaviors such as smoking and drinking.

Why target an older population? “It’s harder for an older person to find a new job, and older individuals have

## THE BIOLOGY OF CHRONIC STRESS

“‘Stress’ is such a simple word. It rolls off the tongue,” says Michelle Williams, Stephen B. Kay Family Professor of Public Health and chair of the School’s Department of Epidemiology. “The challenge is to pin down its biological consequences”—including consequences during and after economic downturns such as the Great Recession.

### AMONG THE KNOWN BIOLOGICAL EFFECTS OF CHRONIC STRESS:



Higher risk of heart disease and hypertension



Increased frequency and severity of upper respiratory infections



Acute sleep deprivation, which alters the body’s immune and hormone-secreting systems



Decreased response to vaccines



Depressed mood or anxiety



Shortened telomeres (the protective caps at the ends of chromosomes), which are associated with accelerated aging and early death



Unhealthy behaviors such as overeating, smoking, and alcohol use

### Sources: Faculty interviews

Annals of the New York Academy of Sciences 2009 August; 1172:34-53

National Institute of Mental Health: Fact Sheet on Stress <http://www.nimh.nih.gov/health/publications/stress/index.shtml>

National Institutes of Health Medline Plus: How to Fight Stress and Ward Off Illnesses <http://www.nlm.nih.gov/medlineplus/magazine/issues/winter08/articles/winter08pg5-6.html>



Although joblessness has been a major problem in Europe, the unemployed face special challenges in the United States. “Earnings loss because of job loss seems to be larger in the United States, because after unemployment benefits run out, people are often forced to take jobs that don’t match well with their skills,” says HSPH’s Clemens

more health conditions to begin with,” Noelke explains. “They’re also becoming a larger proportion of the workforce.” By 2016, one-third of the U.S. workforce will be age 50 and up.

While Noelke is not yet talking publicly in detail about his findings (currently under peer review), he expects the results to be in line with existing studies from European countries and the U.S. The studies have consistently tied unemployment to elevated death rates. A 2011 meta-analysis of international research—published in *Social Science & Medicine* by David Roelfs, Eran Shor, Karina Davidson, and

Joseph Schwartz—found that the risk of death was 63 percent higher during the study periods among those who experienced unemployment than among those who did not, after adjusting for age and other variables.

Some argue that this can be explained by the fact that sicker people are more likely to end up unemployed. But studies focusing on workplace closures—where all employees are let go—suggest otherwise. A 2009 report by University of Albany sociologist Kate W. Strully in the journal *Demography* found that losing a job when a business closes increased the

*continued*

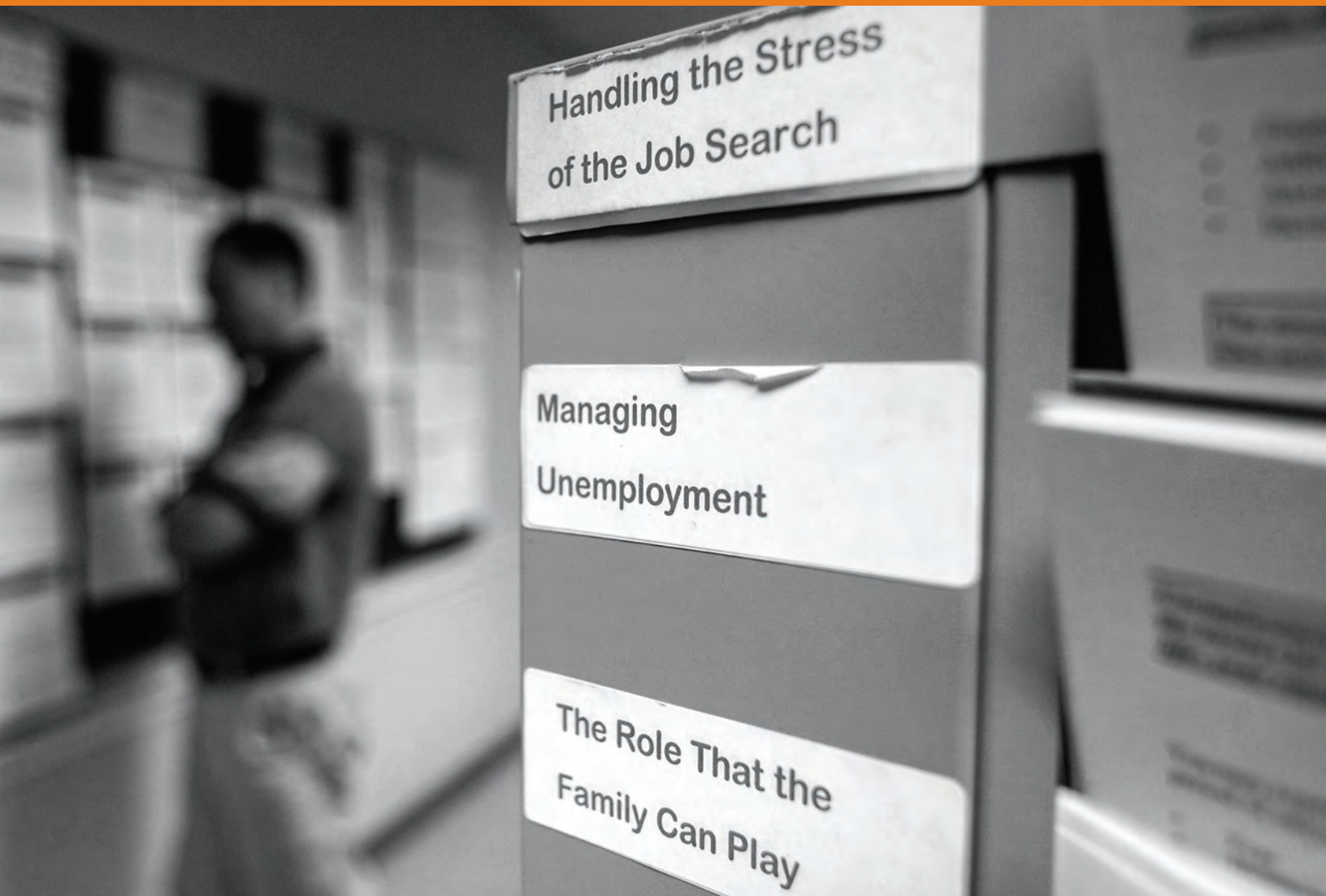


odds of fair or poor health by 54 percent among workers with no preexisting health conditions, and increased by 83 percent the odds of new health conditions likely triggered by job loss—stress-related conditions such as stroke, hypertension, heart disease, arthritis, diabetes, and emotional and psychiatric problems.

Such findings would come as no surprise to those who responded to a 2010 poll, conducted jointly by Knowledge Networks and investigators at HSPH led by Gillian SteelFisher, a research scientist in the Department of Health Policy and Management. The survey found that many people with heart disease, diabetes, or cancer believed that the

downturn was hurting their health and that these negative impacts would only worsen over time. Among the facts unearthed by the poll: About a third of those with heart disease or diabetes and a fifth of those with cancer blame the economic downturn for forcing them to use up their savings to deal with medical bills, co-payments, and other expenses related to their illnesses. More broadly, according to the poll, some 4 in 10 Americans with heart disease or diabetes and 1 in 5 with cancer said the downturn had made it more stressful for them to manage their illnesses, a scenario that in itself may have exacerbated existing health problems.

The Virginia Employment Commission office in Alexandria, November 2009. The U.S. unemployment rate had hit 10.2 percent the month before—the highest rate of joblessness during the Great Recession. Public health costs of the Great Recession may not be fully apparent for many years.



## CASCADE OF CATASTROPHE

The United States is unique among developed countries in its historic reliance on employers to provide health insurance—leaving those who lose their jobs not only without an income but also without health care. While passage of the Affordable Care Act (ACA) in 2010 set the stage for a different scenario, it is not yet clear that the law will result in better health outcomes for the unemployed or underemployed. Katherine Baicker, professor of health economics, co-authored a 2011 paper published by the National Bureau of Economic Research that showed that the improved access to Medicaid resulting from the act raised rather than cut costs; yet while the price of care increased, people reported better health and fewer finan-

tant professor of social and behavioral science Reginald Tucker-Seeley and co-authors Gary G. Bennett and Melissa Scharoun-Lee, both of Duke University, in a June 2009 essay titled “Will the Public’s Health Fall Victim to the Foreclosure Epidemic?”

## FORECLOSING ON HEALTH

First the birds started dying—falling out of trees, found floating in backyard swimming pools. Then humans began to develop strange and frightening symptoms: tremors, confusion, and occasionally paralysis.

It was May 2007 in Bakersfield, California—a city hard hit by the nation’s foreclosure crisis—when the first cases appeared of what was ultimately determined to be West

**The United States is unique among developed countries in its historic reliance on employers to provide health insurance—leaving those who lose their jobs not only without an income but also without health care.**

cial strains associated with health care costs. [For more on this issue, see the profile of HSPH’s Ashish Jha on page 30.]

Although joblessness has been a major problem in Europe, the unemployed face special challenges in the United States. “Earnings loss because of job loss seems to be larger in the United States, because after unemployment benefits run out, people are often forced to take jobs that don’t match well with their skills,” says Noelke.

Others agree. “If you look at countries with strong social safety nets, it’s not as dire for people who are out of work,” says Laura Kubzansky, professor of social and behavioral sciences. “It’s unpleasant, but it doesn’t set up this cascade of catastrophe in the way that it can in this country, where the only net people have once unemployment runs out is frequently their family and savings.” Foreclosure is equally traumatic. As a result of the subprime mortgage crisis that led to the Great Recession, more than 13 million American households were foreclosed between 2008 and 2013. That sprawling calamity yielded “a stressful life event of prolonged duration, with multiple phases of variable intensity,” wrote HSPH assis-

Nile virus infection, a mosquito-borne disease that sometimes leads to fatal brain damage. But if the diagnosis was clear, the cause was anything but, especially given that public health experts had considered this to be an unusually low-risk year.

The answer finally came in the form of aerial photos of Bakersfield. The images revealed hundreds of swimming pools, birdbaths, and Jacuzzis—an estimated one out of six—covered in green fuzz. Almost all of their owners had decamped, leaving empty homes and signs that said “For Sale” or “Bank-Owned Foreclosure.” Ultimately, investigators found more than 4,000 mosquito larvae infected with West Nile strains in 31 neglected pools. What began as a foreclosure crisis had become a public health menace, wrote sociologist David Stuckler, a former HSPH faculty member now at Oxford University, and Sanjay Basu, an assistant professor of medicine and epidemiologist at Stanford University, in their 2013 book *The Body Economic: Why Austerity Kills*.

Losing a home, in other words, may endanger not only the home dweller’s health but also the health of neighbors.

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At HSPH, Mariana Arcaya, Yerby Postdoctoral Research Fellow at Harvard's Pop Center, is also tackling the issue. Lead author of a 2013 report in the *American Journal of Public Health*, she discovered that people who live near foreclosed homes may be at greater risk of being overweight than those who don't have such properties in their immediate neighborhoods.

Arcaya's interest was in demonstrating the "spillover effect" of the foreclosure crisis—that is, its impact on those

Massachusetts from 1987 to 2008, looking at foreclosure records as well as the volunteers' proximity to foreclosed homes and their body mass index (BMI) levels. They found that living within 100 meters of a foreclosed home was associated with a higher BMI of .2 units—the equivalent of a 1.3-pound weight gain in a 5-foot-6-inch person.

What accounts for higher obesity rates among those living near foreclosed homes? Perhaps people are less likely to be physically active when they live in places hit

**Some 4 in 10 Americans with heart disease or diabetes and 1 in 5 with cancer say the downturn had made it more stressful for them to manage their illness.**

whose own homes did not fall prey to foreclosure. Because Americans so often view health outcomes as reflecting individual choices, Arcaya explains, it was important to show that even those who do everything "right" could be affected. "It's easy to think 'You're the kind of person who let your home go into foreclosure, so you are also more likely to be the kind of person who gains weight. You're irresponsible!'" she says. "Spillover effect reveals harmful structural forces in the larger economy."

Arcaya and her colleagues analyzed housing and medical data from 2,078 study participants in

by foreclosure. "You may not want to walk your dog, go running, or garden as much when the physical environment is less appealing," says Arcaya. "There may be houses boarded up. It may not feel as safe."

Even more likely, Arcaya suspects, is that weight gain could stem from added stress fueled by factors that include anxiety over declining property values in the neighborhood. "Real estate is location, location, location, and zoning is such that if my house is 2,000 square feet, a foreclosed house is also probably 2,000 square feet. Why should someone buy my house when they don't want to buy that house? Who would put faith in my neighborhood right now?"

Whatever the pathways turn out to be, HSPH experts believe that the nation's foreclosure crisis will be leaving its imprint on public health far into the future. "Health is not something that can be miraculously revived overnight," Vish Viswanath says. "Even if foreclosures go down, even if people manage to regain a foothold in mainstream society, the consequences will be long-lasting."

### TOXIC INEQUALITY

At the beginning of his bestselling book *Outliers*, Malcolm Gladwell tells the story of Roseto, Pennsylvania, a town settled by Italian immigrants that in the 1950s was found to have astonishingly low rates of heart disease and other leading killers of the era. For men over 65, the death rate



HSPH experts believe that the nation's foreclosure crisis will be leaving its imprint on public health far into the future.



An abandoned, foreclosed, and boarded-up property in the Roxbury neighborhood of Boston, May 2008. Losing a home may endanger not only the home dweller's health but also the health of neighbors.

from heart disease was roughly half that of neighboring towns and the nation as a whole. More broadly, the death rate from all causes was roughly a third lower than what would have been expected.

After ruling out the obvious causes—genetics, diet, and exercise—medical researchers came to a remarkable conclusion: The source of residents' unusual good health was the community's rich social ties and egalitarian ethos.

What Gladwell didn't report was that beginning in the 1960s, Roseto lost its health advantage, as economic growth led to a wider wealth divide, a weakening of traditions and social bonds, and an end to the longstanding

Rosetans suffered one or more heart attacks more than doubled that of the 1960s. Other worrisome conditions—including hypertension and angina pectoris—were also on the upswing.

While not focused on the wealth divide per se, the Roseto follow-up study is in line with a growing body of research suggesting that extreme income inequality may also be bad for health. Such findings are of particular concern, given the ever-widening gap between rich and poor in the United States—a trend that began during the 1970s and has deepened since the Great Recession.

According to Emmanuel Saez, an economist at the

## What began as a foreclosure crisis became a public health crisis in one community when West Nile virus spread through neglected pools on foreclosed properties.

cultural taboo against ostentatious consumption. In the words of Ichiro Kawachi, chair of the School's Department of Social and Behavioral Sciences, "The resulting breakdown of community solidarity was followed by a sharp increase in deaths from coronary heart disease, such that Roseto 'caught up' with neighboring towns." A 25-year follow-up, conducted in 1985, found that the rate at which

University of California, Berkeley, the U.S. economic recovery since 2009 has mostly benefited the rich. From 2009 to 2012, he wrote in a 2013 report, the average income of the top 1 percent of Americans grew by 31.4 percent, while for the bottom 99 percent income grew by only 0.4 percent. Put another way, the top 1 percent captured 95 percent of income gains.

*continued*



To be sure, the question of how—or if—inequality harms health is fiercely debated. One hypothesis is known as social comparison—what most of us think of as “keeping up with the Joneses.” A seminal 2008 study in the *Journal of Human Resources* found an association between “relative deprivation”—a calculation that takes into account both the incomes of the individuals being studied and that of the people with whom they are likely to compare themselves—and risk of death. They reported that each 1.0 standard deviation increase in the index used to calculate relative deprivation was associated with a 57 percent higher risk of death population-wide, as well as with other stress-related health outcomes such as increased risks of smoking, obesity, and use of mental health services.

Above: Hundreds of men and women lined up around a block in midtown Manhattan for a job fair in June 2009. According to Ichiro Kawachi, chair of the HSPH Department of Social and Behavioral Sciences, “When people try hard and fail—which happens a lot during economic recessions—they end up blaming themselves.”

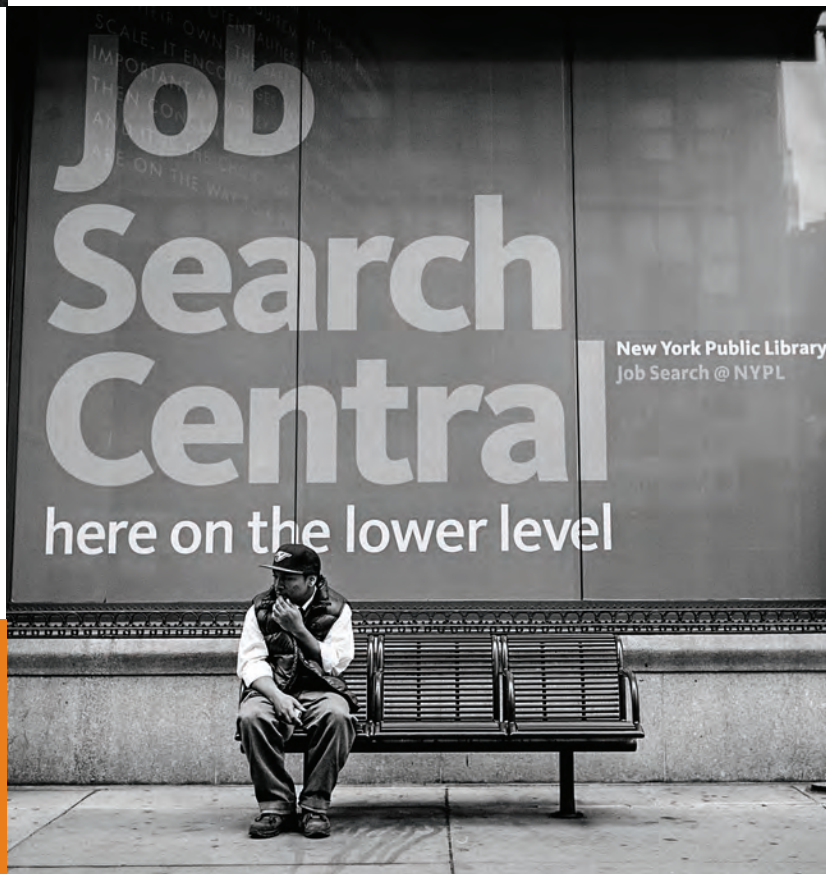
Right: An advertisement for the New York Public Library’s job search facilities, May 2009.

As Kawachi sees it, the United States is an especially fertile breeding ground for stress-related discontent and shame. “Americans think you can just be like Bill Gates or Warren Buffett, but data on social mobility say just the opposite,” he says. “When people try hard and fail—which happens a lot during economic recessions—they end up blaming themselves.” He adds: “We were already one of the most unequal societies—and we just became more unequal, thanks to the Great Recession. And the more unequal a society is, the worse its average health measures tend to be.”

This fact is borne out in statistics showing that the U.S. lags far behind peer countries in the Organization for Economic Cooperation and Development, in measures ranging from life expectancy to anxiety to homicide and drug abuse deaths. “We don’t have to wait another 10 or 15 years to see the smoking gun of the 2008 recession,” Kawachi observes. “Just look at the current statistics. The Great Recession made everything much worse, but we were coming from a pretty bad place.”

*continued on page 24*

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# AN UPSIDE TO THE

# DOWNTURN?

For all the evidence that the Great Recession may do lasting damage to the nation's health, there is a counter-intuitive strand of research that suggests just the opposite. A headline on the digital news website *The Fiscal Times* even touted the "7 Ways the Recession Is Making You Healthier."

Not surprisingly, many are skeptical of this feel-good take. "There are two sides to the story," says SV Subramanian, professor of population health and geography. "The public health people mostly say the Great Recession is bad for you, while the economists mostly say it's good."

Leading the "Recession is healthy" camp is Christopher Ruhm, an economist at the University of Virginia, whose work took center stage in a 2009 *Time* story with the provocative title "Could the Recession Be Good for Your Health?" Ruhm examined statewide mortality fluctuations in the U.S. between 1972 and 1991, finding that a 1 percent increase in a state's unemployment rate led to a 0.6 percent decrease in total mortality.

For those who, like Ruhm, expound the upside of the downturn, the argument goes something like this: With less money flowing through the economy, companies and people cut back. That means, among other things, less pollution as companies rein in production. At the individual level, people have time to exercise and eat better and spend time with friends, while cutting back on expensive bad habits such as smoking and drinking, and hazardous activities such as driving.

But HSPH faculty members are, on the whole, reluctant to see the Great Recession as a public health win. While acknowledging that some indicators do point in this direction—for example, Ruhm's research showing that overall alcohol consumption drops during bad economic times is widely admired—they hesitate to draw broad conclusions. In particular, they note that focusing exclusively on aggregate population-wide health impacts means missing more detailed data that impart the nuances and complications of individual lives—especially over the long term, when many health effects show up.

"Average" is only one part of the story," says Subramanian. "What's missed is the fact that recessions impact different people differently. For example, wealthy people who expect to live long healthy lives will be less likely to succumb to risky behaviors than someone in despair, who doesn't expect to live for another 20 years."

Adds Michelle Williams, Stephen B. Kay Family Professor of Public Health and chair of the School's Department of Epidemiology, "When I read the term 'on average,' red lights go off. We could be talking about 'on average' Upper West Side of Manhattan or 'on average' Appalachia. 'On average' ignores the fact that ours is a heterogeneous society."



Clockwise from top right: © Robert Galbraith / REUTERS, © Faneliphography / iStock, © Corbis, © Mary Alloff / Corbis, © Corbis



### PAINTING THE BIG PICTURE

Given the abundant proof that economic recessions harm health, what policies do we need to offset the trend? HSPH faculty say we need better data about exactly how the state of the economy shapes the state of the public's health. "You can ask and answer a lot of research questions when what we call a natural experiment—like the Great Recession—happens on a population scale," says Michelle Williams, Stephen B. Kay Family Professor of Public Health and chair of the Department of Epidemiology. Among the sensitive indicators of population health worth tracking: birth weights, infant death rates, management of chronic illnesses such as diabetes, psychological distress, engagement with health services, and other measures that reflect not just longevity, but quality of life.

"If the data are not there, you don't know the problem exists," says Nancy Krieger, professor of social epidemiology. She admires the example of public health statistician and economist Edgar Sydenstricker, who in 1933 led an unprecedented 10-city study in the U.S. to evaluate the health impact of the

Great Depression. His survey included fine-grained details not only about health outcomes, but also about wages, unemployment, diet, food insecurity, alcohol consumption, state of mind, and other facts. "What they found was very interesting," Krieger says. "Some of the people who did psychologically worst were those who had previously been OK, if not somewhat affluent, and ended up suddenly being poor; they didn't know how to handle it."

In the same vein, says Krieger, we need to pose similarly nuanced questions to understand what's driving disease trends and health inequities in the wake of the Great Recession. And such investigations, she cautions, take time. "One of the dangerous things when researchers conduct these kinds of studies is to expect fast results—and if they don't get them, to claim there is no harm."

Adds Viswanath: "The impact of stress, lack of treatment, lack of capacity to manage one's life, increased smoking or drinking, eating unhealthy foods, family breakups: those consequences are long-lasting."

**The Great Recession aggravated existing economic inequalities in the United States—and widening economic inequalities have been linked to declines in population health.**



## PROTECTING HEALTH IN BAD ECONOMIC TIMES

Along with collecting data and pushing for better safety nets, HSPH faculty are exploring ways to buffer people from the health impacts of economic downturns. Laura Kubzansky, for example, is looking at the biology of resilience. “What are the resources that would mitigate the impact of stress?” she asks. “What are the assets that enable people to meet life’s demands in a harder way? Wouldn’t it be great if we knew the answers and put some proven protections in place before the next recession?”

More specifically, Kubzansky and other researchers are seeking to determine whether positive psychological factors and emotional states shield people from coronary heart disease (CHD). Several studies have found that opti-

stered by doctors or nurses. It was directed by politicians, economists, and ministers of finance.” So wrote David Stuckler and Sanjay Basu in *The Body Economic*, making the case that economic policies can have profoundly toxic public health impacts—or profoundly restorative effects when nations increase spending during economic downturns for programs such as health care, food stamps, and housing.

But in American culture, this broad social perspective is a hard sell. “The idea that people can collectively act to change things cuts against the American myth of self-sufficient individuals who pull themselves up by their bootstraps,” says Krieger. “Linking economics to health, and suggesting that there’s a social production of disease, is not the mainstream analysis—even as it’s very common in other countries.”

**In essence, all of us who lived through the Great Recession are part of a massive experiment still underway.**

mistic people have about half as much risk of developing CHD as their more pessimistic peers. Another study has linked optimism to a slower rate of atherosclerotic progression over a three-year period. And decades of health psychology research have demonstrated the positive impact of social support—such as family, friends, neighbors, co-workers, pets, and governments and organizations that can lend assistance—on physical well-being and longevity. As researchers identify individual-level factors that promote resilience, they also want to understand the structural and social arrangements that promote or hinder these advantages.

“What drives resilience in some individuals? What leaves others more vulnerable?” asks Williams. “Those are the public health questions we need to answer.”

## A NEW PUBLIC HEALTH AGENDA

In essence, all of us who lived through the recent recession are part of a massive experiment that is still underway. “Thank you for participating in this clinical trial. You might not recall signing up for it, but you were enrolled in December 2007, at the start of the Great Recession. This experiment was not governed by the rules of informed consent or medical safety. Your treatment was not admin-

Another argument for a broader frame of reference is the fact that public health and economic prosperity is a two-way street. It’s not surprising that President Franklin Roosevelt’s New Deal—the panoply of social and economic programs enacted between 1933 and 1938 and credited with pulling the country out of the Great Depression—has been described as a massive public health program. And as David Bloom, the Clarence James Gamble Professor of Economics and Demography, has shown, not only does wealth make health, but health makes wealth—in part because healthier people are more productive and less likely to cost health care dollars. These findings suggest that a national focus on improving Americans’ health even in economic downturns can be part of an overall economic stimulus.

For public health practitioners, acting on lessons from the Great Recession will require both energy and ingenuity. “There has to be an activist agenda,” says Viswanath, with academics translating the evidence in ways that inform public discourse—and, in turn, national programs and policies. “We are fixated on the upstream factors—the recession and its direct economic costs. But the downstream factors—the terrible impact on health—are already far along.”

*Amy Gutman is a senior writer for Harvard Public Health.*



# THE NANO STATE

Hotel rooms, subway cars, offices, airplanes, cruise ships: to most people, the air they breathe inside these places seems benign, if sometimes stuffy and stale. But viewed through the lens of public health, these shared environments sometimes teem with airborne pathogens.

Controlling infectious disease remains one of the most vexing problems in the field, and some of the toughest, most resilient bugs are the ones that survive in air. Among these are the viruses that cause influenza (with their constant mutations, a moving target for vaccines) and the mycobacterium behind tuberculosis (an increasingly drug-resistant agent that kills some 1.3 million people worldwide each year).

Shaw Nielsen



## Can tiny engineered particles help protect us from infectious disease?

### WATER NANODROPLETS PREVENT DISEASE?

Now imagine this: a fine mist of tiny engineered water nanodroplets—each 2,000 times smaller than the width of a human hair—that acts as an invisible shield against these germs.

At Harvard School of Public Health, associate professor of aerosol physics Philip Demokritou, who directs the Center for Nanotechnology and Nanotoxicology ([www.hsph.harvard.edu/nano](http://www.hsph.harvard.edu/nano)), and his research team have discovered an “engineered water nanostructure” (EWNS) that may offer a safe, cost-effective way to kill airborne pathogens. The two most common methods currently in use to

remove pathogens from air—ultra-violet irradiation and high-efficiency particulate air (HEPA) filtration—are expensive and technologically complicated. Other chemical disinfection techniques, such as chlorine or bleach sprays, can be toxic and are almost impossible to deploy in public spaces.

“These engineered water nanostructures are simple to generate. You simply need water and electricity. You can create a shield of EWNS by generating them where you sit. It can be the interior of an airplane in front of your seat, or in your car,” says Demokritou. “It has the potential to change the way we control airborne infectious disease.”

“Sometimes,” he adds, “thinking big requires thinking small.”

### SMALL BEHAVES DIFFERENTLY THAN BIG

For the past decade, scientists and the media have been hyping “nano”—the study of matter that is less than 100 nanometers in one dimension—as a transformative technology. Now researchers and industry have the ability to engineer and characterize these extremely small particles, and nanotechnology has become a major economic force in the 21st century.

These invisible structures behave differently than their larger counterparts, often strikingly so. Iron oxide loses its magnetism, gold turns red, and silver kills bacteria as particle size decreases. “We can come up with new

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advanced materials and technologies with specific properties,” says Demokritou. “Nanotechnology has the potential to help address global problems from energy consumption and environmental remediation to diagnosis and treatment of disease.”

### RISKS OF GOING SMALL

Some of these new nanomaterials, if harnessed and used safely, may benefit society. But because the particles are so tiny—far smaller than a human cell—they may also penetrate biological barriers and trigger severe adverse health effects. For instance, many consumer products, from socks to toothbrushes, are coated with silver nanoparticles. Though these particles kill bacteria, they may also be toxic to human cells.

The properties of silver are well documented, but there are thousands of other nanomaterials—many already available in consumer products from snowboards and sunscreens to electronics and building materials—for which the risks and benefits are not fully known. For Demokritou, the question is how to help nanotechnology reach its full potential while still preserving public safety.

### ONE-STOP SHOPPING

At the “NanoCenter,” as it is called, Demokritou and his research group synthesize and study nano-bio interactions to build a fundamental understanding of why some are more toxic than others. They also hope to develop cheap, high-throughput screening methods to help industry more efficiently test the properties of new materials and discard the most

dangerous ones. The NanoCenter tackles these problems with interdisciplinary teams of biologists, materials scientists, engineers, and physicists.

“The goal of the NanoCenter is one-stop shopping,” says Joseph Brain, the Cecil K. and Philip Drinker Professor of Environmental Physiology at HSPH. “Center investigators can manufacture particles of different compositions, shapes, and sizes, fully characterize them, study how they attach to cells or disperse in the air, test them on animal models, do exposure assessment for humans and life-cycle analysis, and finally focus on risk assessment and risk communication. Our aim is an integrated, holistic approach.”

Demokritou’s group works closely with industrial partners such as BASF and Panasonic, which provide funding and pose real-world problems. This close relationship with industry is critical for ensuring the safety of nanotechnology. “We need to bring all stakeholders together: industry, researchers, regulators, and the public, in order to address the societal implications of nanotechnology,” says Demokritou. Participating in early-stage industrial R&D allows his team to assess the possible uses and toxicological implications of new nanomaterials before they hit the market.

### WATER ELECTROSPRAY PERSISTS FOR HOURS

Demokritou’s discovery of a water nanostructure that kills common pathogens was published in the January 2014 issue of the *Journal of Environmental Science: Nano*, and was selected by the Royal Society of Chemistry as one of the most inno-



vative research studies in 2013. It emerged from a well-known technique used in Demokritou’s lab, called electrospray. By using a high-voltage electric current, it transforms any liquid—such as bleach—into airborne particles, allowing scientists to study its dispersion pattern and persistence. But Demokritou had never tried it with water alone and had never tried to reduce electrosprayed particles to the nanoscale sizes.

George Pyrgiotakis, a postdoctoral fellow in Demokritou’s group who oversaw the experiments, used electrospray to create tiny droplets of water approximately 25 nanometers in diameter (about 10 times wider than a strand of human DNA). He was surprised to find that the tiny water particles persisted in the air for hours instead of evaporating immediately as expected. “It took us a year just to understand why,” says Demokritou with a laugh. They discovered that each tiny droplet carries a negative electric charge, which increases the droplet’s surface tension and thus slows evaporation.

They also learned that their tiny water droplets contained molecules called reactive oxygen species, or ROS, generated during the electrospray. These molecules can damage cell membranes and human DNA, sometimes leading to injury or even cancer.

The scientists wondered if the highly mobile EWNS could act as nanobombs, delivering their ROS payload to airborne bacteria such as TB, rupturing their cell membranes and destroying them.

To test this idea, Pyrgiotakis sprayed the EWNS into a chamber containing a common airborne test bacterium called *Serratia*. Thirty minutes after shutting off the sprays, the bacteria were undetectable: the EWNS had destroyed them all.

### KILLS BUGS, SPARES LUNGS

While the EWNS can't kill tough spores and aqueous biofilms and has not been tested on viruses, it has proven effective against the bacterium *Staphylococcus aureus*—a frequent (and sometimes fatal) cause of skin infection and respiratory disease—and against a mycobacterium similar to the one that causes tuberculosis. The EWNS technology also holds promise for killing foodborne pathogens, such as *E. coli* and *Salmonella*. Demokritou's group recently received a grant from the National Institute of Food and Agriculture, part of the U.S. Department of Agriculture, to investigate this application.

Most important, the same EWNS that damages and kills bacteria doesn't appear to harm the lungs of mice that breathed the mist for four hours. There was no evidence of lung injury or inflammation, and the animals' breathing patterns did not change when the EWNS was turned on and off. Indeed, the mice were unaware of the EWNS in the air. The scientists are not entirely sure why the lungs remain unscathed and say further research is needed.



Philip Demokritou, associate professor of aerosol physics and director of the Center for Nanotechnology and Nanotoxicology

"If you had to design an ideal agent that would kill bacteria and viruses, but leave no toxic residual material, this would be it," says Brain. "Now the key is making the technology more effective by increasing its lethality for diverse pathogens and scaling it up from small chambers to spaces typically occupied by humans or stored foods."

### SAVING LIVES AND THE ENVIRONMENT

Disinfecting a hospital room or a truckload of apples with an EWNS mist might also consume far less energy and resources than any current system. Put simply, this promising environmental nanotechnology, while still at a conceptual stage, has the potential to be an efficient and chemical-free tool in the battle against pathogens.

According to Brain, "Nano's biggest public health contribution over the next 50 years may be decreased energy consumption because of better nano-enabled insulation, paints, and tunable windows and surfaces that would either reflect or absorb heat, depending on the weather. Transportation vehicles such as cars, trains, and planes would be lighter and stronger with composite materials containing nanoparticles and nanofibers. In turn, these technologies would reduce air pollution and CO<sub>2</sub> emissions."

Ultimately, nanotechnology's most dramatic impact in public health may stem not just from doing something like disinfection better or cheaper, but from making our lives greener.

*Barbara Moran is an award-winning science journalist and author, based in Boston. She received the 2011 National Association of Science Writers Science-in-Society Award.*



For more on the NanoCenter's recent work, go to <http://hsph.me/nano>

# The Provocative PRAGMATIST


Several years ago, Ashish Jha got the call that middle-aged children dread. His mother was on the phone from New Jersey. His basically healthy 74-year-old father was confused and unresponsive, obviously ill, and needed to go to . . .

“Probably the most dangerous place in the world for a human being: an American hospital,” says the Harvard School of Public Health professor of health policy and management. “Nothing we do in our lives puts us at such great risk for injury as being a patient in a hospital. Not driving. Not flying. Not even being a pedestrian in Boston. Nothing else is close.”

That’s surprisingly strong stuff from someone known for his unbiased, play-it-straight approach to research, whose data-dense articles are published in upper-echelon medical and health policy journals, and who is an increasingly influential member of the Washington health care wonkerati.

But it’s not the least surprising when you know that Jha, MPH ’04, is a social media natural with a witty Twitter feed and a well-read blog, that he wants to shake up the incentives in health care so it becomes safer and less costly (one proposal: tying hospital CEO pay to patient safety outcomes), and that prowling within a disarmingly sunny, friendly personality is impatience, bordering on outrage, at the snail’s-pace rate of change in health care: “There are real human costs to taking an incremental approach to health care safety. Tens of thousands of people—tens of thousands—die needlessly each year because we are not moving fast enough.”

*continued*

A portrait of Ashish Jha, a man with dark hair and glasses, smiling. He is wearing a grey blazer over a blue and white checkered shirt and a red tie with a small white pattern. He is standing in front of a large window with a view of a city skyline. The text is positioned to the left of his head.

With a mixture of research,  
persuasion, and social media  
moxie, Ashish Jha seeks to drive  
health care improvements.

## ACA NOT A PANACEA

Some contend that the Affordable Care Act (ACA) will put the foot on the accelerator. Jha disagrees. He was happy that the Supreme Court upheld the law, describing it as the most important health policy innovation in the world today. “It’s a good first draft, but nobody’s first draft is perfect. I wish we could rewrite parts of it.”

The main thrust of the ACA is expanding health insurance. But as Jha points out, “Health insurance gives you more access to health care—but health care isn’t health.” A study of Medicaid coverage in Oregon conducted by his colleague Katherine Baicker, PhD ’98, HSPH professor of health economics, showed that while such coverage did improve mental well-being and financial security, it did not improve many key measures of physical health.

The reason, Jha says, is that the law doesn’t do enough to improve the quality of health care that it’s helping pay for. Improved quality consists not only of reducing the number of errors, but also of remedying the acts of omission: the preventive services that aren’t delivered properly or the evidence-based treatments that aren’t followed. “The big things that cause morbidity and mortality and suffering—things like heart disease, high blood pressure, diabetes, chronic diseases—our system is just not very



them at twice the rate of another hospital, it gets paid about the same amount. That doesn’t seem quite right.”

## BIHAR TO BOSTON

Jha was born in the northeastern India state of Bihar, one of the poorest regions in the country, and lived there till he was 9, when his parents, both educators, emigrated to Toronto. When he was 14, the family moved to Morris County, New Jersey. Jha thrived—a gifted math and science student, editor of the high school newspaper. He had the motivation that comes with being the child of immigrants. “The way you become accepted is through demonstrable achievement. You have to be able to show that you are good, that you are worthy, that you belong.”

“If a hospital takes care of heart attack patients and kills them at twice the rate of another hospital, it gets paid about the same amount. That doesn’t seem quite right.”

good at managing them.” While the ACA makes minor improvements in those areas, in Jha’s view they’re weak medicine for a serious problem.

Stronger medicine, says Jha, would be major changes to the way health care is paid for, which he contends has only been tinkered with over the past 50 years, and in a way that largely turns a blind eye to safety and outcomes. “If a hospital takes care of heart attack patients and kills

After graduating from Columbia University as an economics major, he applied to medical schools for the reason you can’t mention on applications: to please his parents. They desperately wanted one of their two children to become a physician; his older brother was emphatically not interested. Jha went into internal medicine because “as an internist, your specialty is the patient, not an organ or a disease.” He still practices, working as a hospitalist in two-



“Nothing we do in our lives puts us at such great risk for injury as being a patient in a hospital. Not driving. Not flying. Not even being a pedestrian in Boston. Nothing else is close.”

week rotations about six times a year at the VA Medical Center in West Roxbury.

It was near the end of his residency that Jha had the insight that steered him to a career in public health. The shortcomings, the frustrations, and the mistakes he was making happened not because he wasn't smart enough or working hard enough, but because of the health care system itself. “If the goal was to be as good a doctor as I could be, the only way was to work in a better system.” He went on to a two-year program that combines a general medicine fellowship at Brigham and Women's Hospital and an MPH at HSPH.

Today's physicians and nurses, he explains, are better trained and equipped than ever before. But with all that capability comes complexity—and an exponential growth in the chances for things to go wrong. Jha argues that the focus needs to be on fixing systems. “Investing in improvement is no longer about telling doctors and nurses to do the right thing. It's about fundamentally redesigning how you take care of patients.”

## RAISING THE STAKES

Jha has a convert's zeal and conviction when it comes to revelatory powers of data. His blog is called *An Ounce of Evidence*, and the tagline for it and his Twitter handle states that “an ounce of data is worth a thousand pounds of opinion.” Jha says his only strongly held view is that “we should use data and empiricism to make decisions,”

and he's known for keeping bias and preconceived notions out of his research. “Ashish truly lets the evidence tell the story,” says Julia Adler-Milstein, PhD '11, an assistant professor at the University of Michigan and a former student of Jha's.

Jha has a split PubMed personality. He's got researcher cred to spare as the co-author of dozens of the sorts of studies that home in on a relatively narrow question and build the knowledge base, result by result. But he also has a flair for analysis and a comparable number of review and opinion pieces on topical issues such as big data, hospital readmissions, and electronic health records (strongly for). His overarching concern is health care quality and patient safety.

In that regard, Jha has shoulders at the School on which to stand. Lucian Leape, an adjunct professor in health policy and management, and other faculty pioneered the science of documenting medical errors, revealing how common these mistakes are, yet how infrequently they result in lawsuits.

Jha had a front-row seat on the issue during his father's hospitalization for what turned out to be a transient ischemic attack. Fortunately, his father was not harmed, but Jha witnessed three serious errors in his care, including his father receiving a medication intended for another patient.

Jha sees patient safety through the lens of systems analysis and through his own experience as a physician.

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He advocates the adoption of electronic health records. “I’ve practiced in paper-based systems, and I’ve practiced in electronic systems. I’m a much better doctor when I am practicing in an electronic system.”

He also supports financial incentives that put real money at stake to drive improvements in quality. Jha coauthored a study published earlier this year showing that the size of compensation packages for the CEOs of nonprofit hospitals are correlated with technology improvement and patient satisfaction scores, but not with patient outcomes or community benefit. “Doctors and nurses don’t practice in a vacuum—they practice in systems. And how a health care system sets up your doctor and nurse to be able to do the right thing is determined not by what’s going on in the clinic or the hospital room, but in the boardroom and the CEO’s suite.”



Jha had a front-row seat during his father’s hospitalization for what turned out to be a transient ischemic attack. Jha witnessed three serious errors in care, including his father receiving a medication intended for another patient.

Jha believes that CEO pay should, in large part, hinge on quality improvement and patient safety. He further argues that as much as 15 or even 20 percent of hospital revenues should be at stake, to motivate a health care organization’s leadership to incorporate quality and safety into day-to-day practice.

Jha even floats the idea of letting patients wield financial clout. Instead of relying on surveys and satisfaction scores, how about giving patients say-so over how much is paid for their care—up to 30 percent of the bill?

“That’s Ashish for you,” says Leah Binder, president and CEO of the Leapfrog Group, an employer-financed organization that grades hospitals. “Always, always outside the box.”

#### TRUST THE MESSENGER

It’s a safe bet that some of Jha’s message would not be received so kindly if the messenger weren’t so engaging. He smiles easily and laughs, sometimes at himself. Adler-Milstein describes her former teacher as the “most socially adept person I have ever met.” Many people in health policy circles principally think about what they have to say, notes Mark Miller, executive director of the Medicare Payment Advisory Commission, which advises Congress on Medicare policies. Jha stands out because he listens.

Given his social grace, it makes sense that Jha thrives in the chatosphere of social media. His Twitter handle, @ashishkjha, has more than 4,000 followers—hardly Bieberian, but impressive for somebody who tweets about Medicare data sets and quality indicators. Jha has found that Twitter’s 140-character limit distills, rather than constrains, his thinking: “You need to get quickly to the point of what’s important, why people should read



## ASHISH JHA'S HOSPITAL SURVIVAL GUIDE

Hospitals can be disorienting, dangerous places for patients, particularly the elderly. Topping the list of safety concerns are medication errors, hospital-acquired infections, blood clots and pressure ulcers caused by long periods of immobility, and falls. HSPH's Ashish Jha offers tips for making your hospital stay or that of a loved one safer and more comfortable.

- Make sure friends or loved ones are present. They can advocate for you when you are not alert and help keep you calm and grounded.
- If you are hospitalized for a planned procedure, bring several copies of your medication list.
- Don't be afraid to raise questions or concerns. It is reasonable to politely inquire whether a doctor has sanitized his or her hands or to ask why a medication is being dispensed.
- Get up and start moving as quickly as possible. Too much immobility can lead to medical complications.

this. It forces clarity." He started his blog in 2012 because he wanted to make unnecessarily confusing health care policy issues intelligible for a wider audience.

Most of Jha's posts are his pithy gloss on health care policy doings and research (including his own). But he sometimes dips into personal experience. He told the world not only about his father's hospitalization, but also about his experience last summer as an emergency room patient, after he fell while rollerblading and dislocated his left shoulder. The pain was excruciating but went untreated for too long, he recalls, with some of the staff more concerned with securing his insurance information than easing his suffering.

### THE COST OF COMPLACENCY

Health care quality is not just a rich-world problem, and Jha cites research showing that between 20 and 30 million years of healthy life are lost each year globally because of injuries from hospital care. Numbers like that mean unsafe hospitals should be framed as a major public health threat, he says. Having established the Harvard Initiative on Global Health Quality, he is partnering with the Global Health Delivery Project, co-founded by Paul Farmer, and will be collaborating with Indian health officials to improve the quality of health care there. This spring, Jha

is teaching an EdX course on improving global health care. [Sign up for it online at <http://bit.ly/ph555x>]

No one would ever say they are against improving the quality of health care. But Jha points out that there are entrenched interests in any health care system—people and institutions who like and depend upon the status quo. He counters that the cost of not doing more, of merely working around the edges of quality-of-care issues, is too high.

"We're not going to solve these problems without evidence, new knowledge, new insights. That's what's so exciting about working on health care issues right now: It's a chance to craft solutions with real-life impacts—a chance to save lives."

*Peter Wehrwein is a Boston-based journalist and editor specializing in health care and science.*

**Hear more from Ashish Jha on health system reform in the videos:**

<http://hsph.me/jha-fixingbrokensystem>  
and

<http://hsph.me/jha-insuranceandhealth>

**Follow Jha on Twitter @ashishkjha**

**Follow his blog at <http://blogs.sph.harvard.edu/ashish-jha/>**

# Time For Thinking

*Fellowship program spurs midcareer pros to solve big problems.*

On many Mondays during the 1980s, Uche Amazigo took time off from teaching at the University of Nigeria to travel into her country's rural villages and talk to women. A biologist and tropical disease specialist, Amazigo taught them about hygiene and nutrition and listened to their many health concerns.

On one of these trips she met a young pregnant woman named Agnes, who was suffering from a debilitating and disfiguring rash. The cause, Amazigo would discover, was the parasitic disease onchocerciasis, also known as river blindness. Abandoned by her husband because of her scars, Agnes was unable to afford the treatment that would stop her unrelenting itching and save her sight. Amazigo was not only moved to help this desolate victim, but she later joined what would become a more than 20-year campaign against a common but neglected infection that brings immense hardship for some of the world's poorest people.





And the success of Amazigo's river blindness control campaign is partly due to a decision she made at a key point early in her research: to step away from her fieldwork and spend a year (1991–92) as a research fellow in the Takemi Program in International Health at Harvard School of Public Health, supported by a grant to the Takemi Program from the Carnegie Corporation of New York. She credits that time—researching, taking courses, and discussing policy issues with the tight-knit and interdisciplinary community of fellows from around the world—with dramatically expanding the scope of her mission.

“The Takemi Program helped me put together my research findings in such a way that the scientific community would appreciate its importance,” Amazigo says. “It moved me from being a national scientist and researcher to an international health practitioner who is more effective on my own continent.”

#### REFOCUSING AND RECHARGING CAREERS

For 30 years, the Takemi Program has offered midcareer professionals from health, economics, and policy fields “protected time” to take advantage of Harvard's resources and the flexibility to pursue their own scientific questions. The goal is to develop leaders who will apply what they've learned to improve health in their home countries. Takemi Fellows have gone on to become health ministers, academic deans, heads of nongovernmental agencies, and social entrepreneurs around the world.

During her fellowship year, Amazigo focused her research on the burdens and social stigma caused by onchocerciasis skin lesions and itching—a cruel aspect of the disease ignored by treatment programs at the time. Her work helped spur the launch in 1995 of the World Health Organization (WHO)'s African Program for Onchocerciasis Control, which she joined and later led. During her time with the WHO, she was instrumental in developing and scaling up

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**Takemi Fellows at the program's 30th anniversary celebration in Fall 2013**

a community-directed strategy for distributing the antiparasitic drug Mectizan to the remote areas most at risk for the disease.

Amazigo was driven to ensure that those suffering from the disease had a voice in finding solutions. "I don't think I would have had the courage to speak for them at international organizations if I had not passed through Takemi," she says. "The program taught us that you must be able to argue for those who are not there but who deserve to be heard."

The Takemi Program was launched in 1983 by former HSPH Dean Howard Hiatt and by the late Taro Takemi, who at the time was president of the Japan Medical Association (JMA). Since then, 241 Takemi Fellows from 51 primarily low- and middle-income countries have taken part in the program. The JMA has been a key partner to the Takemi Program for many years.

"There really is no other program like it in the world," says Michael Reich, the program's director and the Taro Takemi Professor of International Health Policy. Participation

in the Takemi Program "moves people from a focused research perspective to the frontiers of knowledge and policy and gives them the confidence to produce change in their own institutions and in their own lives."

Keizo Takemi, a politician, academic, and son of the program's founder, used his time as a Takemi Fellow to collaborate with Reich and other Harvard faculty members on developing key content for Japan's global health proposal at the G8 summit in 2008. The work helped shift the focus of global health policy toward strengthening health systems, both in Japan and worldwide, Reich says.

#### CHANGING HOW JAPAN THINKS ABOUT HEALTH

The program is also changing the way Japan thinks about public health, adds Keizo Takemi. As Japanese fellows have returned home and taken on leadership roles in the public health community, they have been promoting an interdisciplinary approach to health policymaking.

*continued on page 49*

医道開心貫  
太郎

***"An open mind  
is the moral  
essence  
of medicine."***

***—Dr. Taro Takemi***



Top, Bethany Versoy; left, Takemi Program



## TAKEMI FELLOWS WHO ARE CHANGING THE WORLD

*These are just a few of the 241 highly accomplished fellows who have been part of the Takemi Program.*

**Nii Ayite Coleman** (1996–97) is a public health physician, coordinator of the Health Policy and Leadership Program at the Ghana College of Physicians and Surgeons, and the focal person for National Health Insurance in Ghana's Ministry of Health.

**Luiz Facchini** (1996–97), a Brazilian physician with the Social Medicine Department at the Federal University of Pelotas, currently coordinates the Primary Health Care Research Network in Rio de Janeiro and serves on the Executive Board of the World Federation of Public Health Associations.

**Minah Kang Kim** (2010–12), associate professor in the Department of Public Administration at Ewha Womans University, South Korea, has served on numerous expert advisory committees and advisory boards for the Korean government.

**Nafsiah Mboi** (1990–91) serves as minister of health for Indonesia and as chair of the Board of the Global Fund to Fight AIDS, Tuberculosis and Malaria, and previously served as secretary of Indonesia's National AIDS Commission and as a member of Indonesia's Parliament from 1992 to 1997.

**Friday Okonofua** (1991–92), professor of obstetrics and gynecology at the University of Benin, Nigeria, has served as the executive director of the International Federation of Gynecology and Obstetrics and as honorary adviser on health to President Olusegun Obasanjo of Nigeria, and is currently program officer for the Ford Foundation in Lagos.

**M. Prakasamma** (1992–93), a public health nurse with extensive experience in education in India, is founding director of a nongovernmental organization known as ANSWERS, which conducts research and training on maternal health, quality and equity in health services, and issues related to the health workforce, especially nurses and midwives.

**Sujatha Rao** (2001–02), a former union secretary of the Ministry of Health and Family Welfare, Government of India, has served as chairperson of the Portfolio Committee of the Global Fund to Fight AIDS, Tuberculosis and Malaria, a member of the Global Advisory Panel of the Bill & Melinda Gates Foundation, a founding member of the Public Health Foundation of India,

and a member of the Advisory Board of the Ministerial Leadership Program of HSPH.

**Keiji Tanaka** (1984–85) is former chair of the Board of Regents at Tokyo Medical University and previously served as a high-ranking official in Japan's Ministry of Health, Labor, and Welfare.

**Mukund Uplekar** (1988–89) is a senior medical officer at the World Health Organization in Geneva, where he works in the Policy, Strategy and Innovations unit of the Global TB Program.

**Hong Wang** (1994–95) is senior program officer for health economics and financing at the Bill & Melinda Gates Foundation, and was previously a faculty member at Beijing Medical University and Yale University.

**Li Yin** (2002–03), a medical doctor with public health training, is director of China's State Food and Drug Administration and previously worked for China's State Council.

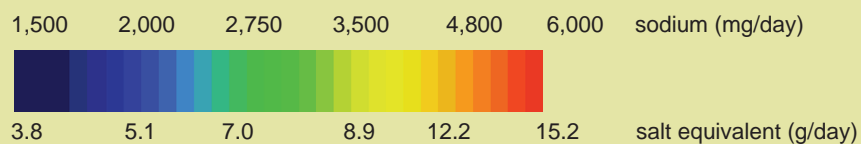
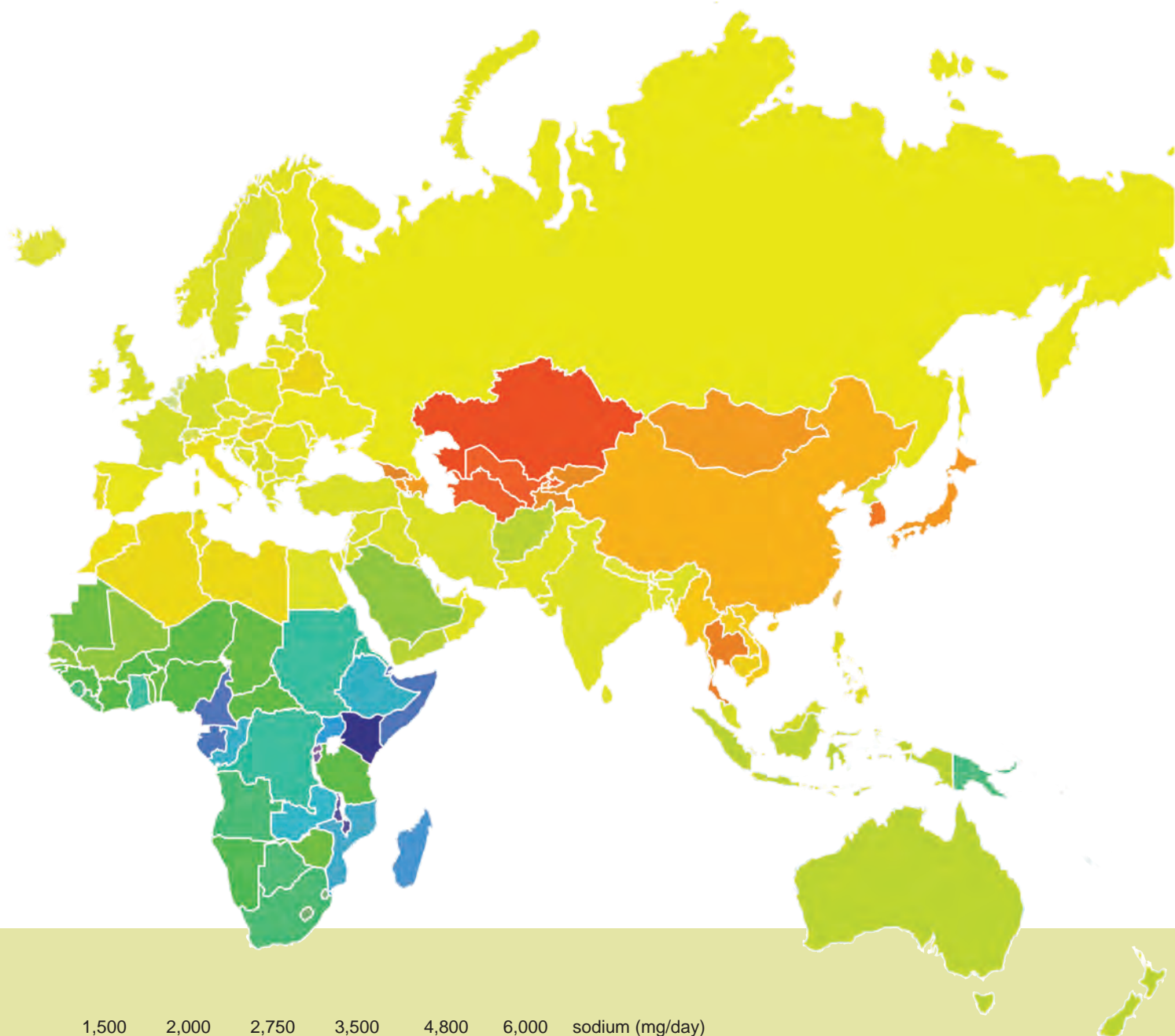
**Learn more by watching the Takemi Program's 30th anniversary video at <http://hsph.me/takemi30>**



# Where's the Salt?

**P**People across the globe are consuming far more sodium than is healthy, according to a new study led by researchers at Harvard School of Public Health and the University of Cambridge. In 181 of 187 countries (constituting 99.2% of the world adult population), national intakes exceeded the World Health Organization recommendation of less than 2 grams of sodium per day. In 119 countries (88.3% of the world's adult population), the national intake of sodium exceeded this amount by more than 1 gram per day. The study is the first to estimate country-specific sodium intake.

Sodium intake was highest in East and Central Asia, Eastern Europe, and the Middle East. The United States population averaged 3.6 grams of sodium per day. Excess sodium is a major risk factor for cardiovascular disease and increases the risk of stomach cancer, a leading fatal cancer worldwide. According to the authors, virtually all populations would benefit from sodium reduction. The study was published online on December 23, 2013, in *BMJ Open*.



#### AGE-STANDARDIZED ESTIMATED SODIUM INTAKE (G/DAY) IN 2010 FOR PERSONS AGED 20 AND OVER

##### Lowest sodium consumption

Jamaica 1.92  
 Burundi 1.73  
 Comoros 1.67  
 Malawi 1.66  
 Rwanda 1.60

##### Highest sodium consumption

Kazakhstan 5.98  
 Turkmenistan 5.43  
 Bahrain 5.38  
 Kyrgyzstan 5.38  
 Georgia 5.30

[illegible]

# New Leadership-Focused Doctoral Program Draws Unprecedented Interest

A new HSPH doctoral program beginning in July has generated an unprecedented level of interest, drawing 286 applicants for just 15 spots. The Doctor of Public Health (DrPH) program will prepare graduates to be leaders in the health sector—such as health ministers, heads of government agencies, directors of nongovernmental organizations, or corporate executives—by providing a unique mix of classroom training and real-world experience. The program has clearly “struck a chord,” says Peter Berman, faculty director of the new DrPH degree program.

Historically, HSPH’s doctoral programs have focused on preparing students for leadership roles in academic and research settings, with an emphasis on scientific rigor and deep knowledge of the field. The DrPH will instead focus

speakers, short experiences in the field, and simulations.

And instead of writing a traditional dissertation, in the last year of the three-year program they will work at a public-health-related organization or government agency on a “culminating project” that achieves a significant public health result. For instance, a student might work at an NGO to improve control of an emerging noncommunicable disease in a middle-income country. Another might work at a U.S. government agency to reduce numbers of the uninsured poor in one of the 50 states. Both would devise their projects, implement them, and measure their effectiveness.

The first class will be diverse, with a wide range of work experience—a program requirement—and will come from all over the world. Roughly a third of the Americans in the

**“Health systems are becoming more complex, and the challenges for people who lead in these systems are becoming more complicated.”**

*—Peter Berman, faculty director of the new DrPH degree program*

on “translation”: teaching people who will lead government agencies, NGOs, or private sector businesses how to use public health research and science to develop policies and programs that dramatically improve population health.

“The logic behind this program is that, all over the world, health systems are becoming more complex, and the challenges for people who lead in these systems are becoming more complicated,” says Berman. “Until now, doctoral degrees in public health have essentially been research degrees, and people with these degrees who chose to pursue careers of action and service have had to learn leadership skills on the job. This is the gap that our DrPH degree is trying to fill.”

## NEW WAYS TO TACKLE HEALTH PROBLEMS

Students in the program will study essential public health topics—epidemiology, biostatistics, social sciences, research methods—but also will learn about leadership, management, innovation, and communications. They’ll learn both through classroom lectures and from case studies, visiting

program will be from underrepresented minority groups. In future years, each new class will include 25 students. Berman says those accepted to the program “are and will be an amazing group of really interesting and capable people across the whole spectrum of public health interest.”

## A STEP UP IN TRAINING

HSPH’s new doctoral program was developed over the past year amid a general rethinking of professional graduate education in public health—a sense that stepped-up training is necessary to create a larger and more varied group of leaders to tackle increasingly complex health problems.

“While a number of other schools of public health have instituted new or revised DrPH degree programs, we believe HSPH’s innovative program represents a giant leap forward,” says Ian Lapp, associate dean for strategic educational initiatives. “That’s because it gives students not only a broad understanding of all aspects of public health, but also the tools and training they need to lead, manage, and create real change in the health of people the world over.”

# ALUMNI NEWS

## 1952

**Jack Makari**, SM, of Suffield, Connecticut, passed away on May 4, 2013, at age 95. The author of more than 55 scientific articles, holder of four patents, and recipient of numerous scientific honors, Dr. Makari was known for his pioneering work in immunology and cancer.

## 1959

**Nevin Scrimshaw**, MPH, a nutritionist who improved the health of millions of children in developing countries by creating low-cost, vegetable-based foods for weaning infants, passed away at age 95 on February 8, 2013.

## 1965

**Richard Morrow**, MPH, physician and professor at the Johns Hopkins Bloomberg School of Public Health, died of pancreatic cancer on August 17, 2013, at age 81. A pioneer in international public health, Morrow was instrumental in establishing programs in developing countries, particularly Ghana and Uganda. He received the 2006 Lifetime Achievement Award from the American Public Health Association's International Health Section.

## 1967

**Siegfried Pueschel**, MPH, passed away on September 2, 2013, at age 82. Dr. Pueschel had worked 38 years at Rhode Island Hospital and Brown University before retiring in January 2013, and was globally recognized as a leading researcher on Down syndrome.

## 1970

**Donald Hopkins**, MPH, who has been a leader in the fights to eradicate smallpox and Guinea worm disease,



was awarded an honorary Doctor of Science on May 30, 2013, by Harvard University.

## 1974

**Louis Bartoshesky**, MPH, chair of pediatrics at Christiana Care Health System—a provider headquartered in Wilmington, Delaware—received the inaugural Compassion in Practice Award from Joy-Hope Foundation.

## 1976

**Judith Salerno**, SM, nationally known expert in both health policy and research, was named president and CEO of Susan G. Komen, the world's largest breast-cancer organization. Salerno came to Komen after serving as executive director and chief operating officer of the Institute of Medicine of the National Academy of Sciences.

## 1977

**Yale Bohn**, SM, joined Pepper Hamilton LLP as special counsel in the Princeton, New Jersey, office. Bohn is a member of the firm's corporate and securities practice group, focusing his practice on health care law.

## 1979

**Diane Mundt**, SM, of Hull, Massachusetts, was tragically killed on July 10, 2013, along with two other passengers in a minivan while returning to the airport in Port au Prince, Haiti, after completing a project for the people of Haiti. Mundt specialized in the fields of epidemiology and public health policy.

## 1982

**Miriam A. Markowitz**, SM, has joined AABB, based in Bethesda, Maryland, as its CEO. AABB is an inter-

national, not-for-profit association representing individuals and institutions in the field of transfusion medicine and cellular therapies.

**Diane Stringer**, SM, president and chief executive officer of Care Dimensions, was appointed to the Board of Trustees of Salem State University by Massachusetts Governor Deval Patrick.

## 1983

**Alan B. Cohen**, SD, was appointed in April 2013 to the 21-member Advisory Panel on Improving Healthcare Systems of the Patient Centered Outcomes Research Institute, established under the U.S. government's Affordable Care Act of 2010.

## 1985

**Leslie Korn**, MPH, published an integrative medicine textbook for the treatment of traumatic stress, entitled *Rhythms of Recovery: Trauma, Nature and the Body* (Routledge, 2012).

## 1988

**Jesse Berlin**, SD, was presented the Lagakos Distinguished Alumni Award from Harvard School of Public Health's Department of Biostatistics on October 31, 2013, in recognition of his achievements in education, scientific collaboration, and statistical methodology, as well as his leadership in the pharmaceutical industry. The award was created to honor the career of the late Stephen Lagakos, former chair of the Department of Biostatistics.

## 1990

**Carolyn “Carrie” Hessler-Radelet**, SM, was nominated by President Barack Obama as director of the Peace Corps. “As deputy director of the Peace Corps, Carrie has been instrumental in recruiting and training thousands of Peace Corps volunteers who work to promote social and economic development around the world,” said President Obama. “I’m delighted to nominate her as director, so this program can continue to benefit from her vision and commitment.”

**John Rich**, MPH, a 2006 MacArthur Foundation grant recipient and nationally renowned leader in addressing urban violence and trauma, served as interim dean at Drexel University School of Public Health from July 2013 through February 2014. At Drexel, Dr. Rich founded and co-directs the Center for Nonviolence and Social Justice.

## 1991

**Jane Carrie Weeks**, SM, a prominent researcher at Dana-Farber Cancer Institute, internationally known for building the discipline of outcomes research in oncology, and admired by colleagues as an outstanding mentor, died on September 10, 2013, at age 61 after a long illness. She was “one of the true intellectual pillars of the Harvard medical community,” said Dana-Farber President Edward Benz Jr.

## 1992

**John Da Silva**, MPH, SM, was named vice dean at Harvard School of Dental Medicine. Dr. Da Silva serves on the Board of Trustees of the American Academy of Implant Dentistry and is also the president-elect.

## 1993

**Bhaswati Bhattacharya**, MPH, director at The DINacharya Institute in New York, was awarded a senior Fulbright-Nehru U.S. Scholar grant. During the 2013–2014 academic year, she is lecturing and conducting research in Ayurvedic medicine, based at Banaras Hindu University in Varanasi, Uttar Pradesh, India.

**Albert Jovell**, MPH, SM, DPH, passed away November 26, 2013, at age 51. Dr. Jovell was the chairman of the Spanish Patients’ Forum and the director of the Global Institute of Public Health and Health Policy at the International University of Catalonia. He had been involved in the HSPH Alumni Association as a volunteer on the Global Alumni Network Committee, and as a partner with the HSPH Executive and Continuing Professional Education program.

## 1995

**Robert Taube**, MPH, executive director of Boston Health Care for the Homeless Program (BHCHP), retired after leading the organization for 15 years. Taube guided BHCHP through unprecedented change and growth, including a \$42 million renovation of the old city morgue into a gleaming, high-tech hub for clinical and administrative operations.

## 1996

**Diane Schneider**, SM, published *The Complete Book of Bone Health*, (Prometheus Books, 2011) covering such areas as the best ways to build and strengthen bones to last a lifetime, bone density assessment, prescription and alternative treatments for low bone density, and the effects of common medical problems on bone health.

## 1998

**Joanne Wolfe**, MPH, was selected as the recipient of the 2013 American Cancer Society Pathfinder in Palliative Care Award, which recognizes outstanding achievements of a professional who has demonstrated remarkable innovation and ingenuity in the advancement of palliative care.

## 1999

**Gabriel Leung**, MPH, became the 19th dean of the Li Ka Shing Faculty of Medicine at Hong Kong University (HKU), on August 1, 2013. Dr. Leung most recently served as the head of, and a clinical professor in, the School of Public Health and the Department of Community Medicine at HKU.

**Anita Zaidi**, SM, who left a successful pediatric career in the United States to save children’s lives in her homeland of Pakistan, has won the first-ever \$1 million Caplow Children’s Prize. Zaidi will use the prize to implement a comprehensive program focused on reducing neonatal deaths during the first 28 days of life—the segment of child mortality most resistant to successful intervention worldwide.

**Paul Allen**, MPH, was named chief quality officer at Cambridge Health Alliance. Allen’s areas of responsibility include quality management and improvement, infection prevention, pharmacy, regulatory affairs, and risk management.

**Tejal Gandhi**, MPH, became president of the National Patient Safety Foundation (NPSF). Dr. Gandhi long served on the NPSF Board of Governors, most recently as vice chair.

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As president of the organization, she also assumes the role of president of the Lucian Leape Institute at NPSF, a think tank made up of national experts who explore new paths to improving patient safety.

## 2000

**Sonja Mackenzie**, SM, published a new book, *Structural Intimacies: Sexual Stories in the Black AIDS Epidemic*, in the Rutgers University Press Critical Issues in Health and Medicine series. The book addresses the nexus of health, sexuality, and critical race studies.

**Ruth Browne**, SD, is the honored recipient of the 2013 Lewis and Jack Rudin New York Prize for Medicine and Health from the Greater New York Hospital Association and the New York Academy of Medicine, together with the Rudin Family Foundation. Dr. Browne is the chief executive officer of the Arthur Ashe Institute for Urban Health and the director of the Brooklyn Health Disparities Center.

## 2002

**Karen DeSalvo**, SM, was named by the U.S. Department of Health and Human Services as the next National Coordinator for Health Information Technology (HIT). Prior to this appointment, DeSalvo was the City of New Orleans health commissioner, where she made increased utilization of HIT a cornerstone of the city's primary care efforts and a key part of its policy development, public health initiatives, and emergency preparedness.

**Mayuko Toyota**, SM, was elected to the Japanese Parliament to represent the Saitama 4 District in the House of Representatives. Previously, she was

the deputy director of the International Affairs Division of Japan's Ministry of Health, Labor & Welfare.

## 2004

**Patricia Moran**, MPH, was promoted to the Of Counsel title at the Boston law firm Mintz Levin, representing clients on employee benefits and compensation matters. Moran has special expertise on the federal Affordable Care Act's employer and insurance mandates, the Massachusetts "Fair Share" employer mandate, COBRA, HIPAA, and retirement plan compliance. She frequently writes and speaks on employee-benefits-related matters.

## 2007

**Ednan Bajwa**, MPH, was awarded a \$40,000 ATS Foundation Unrestricted Grant to support research in acute respiratory distress syndrome (ARDS). A devastating lung condition that affects more than 200,000 patients in the U.S. annually, ARDS results in more deaths than breast and skin cancer combined. In his current project, Dr. Bajwa will explore whether a novel blood test that measures levels of a protein called ST2 can be used to identify patients who have ARDS.

**LaQuandra Nesbitt**, MPH, was named to the Health Care Industry Council of the Federal Reserve Bank of St. Louis. The members' observations help ensure that conditions of Main Street America are represented in monetary policy deliberations in Washington.

## 2009

**Speciosa Wandira-Kazibwe**, SD, was appointed as United Nations special envoy for HIV/AIDS in Africa by U.N. Secretary-General Ban Ki-Moon.

Currently, she is senior adviser to the president of Uganda on population and health. She served as vice president of Uganda from 1994 to 2003.

## 2011

**Jacinda Nicklas**, MPH, was awarded a \$25,000 2013 Center for Women's Health Research Junior Faculty Research Development Award, to be used for her research project at the University of Colorado. Dr. Nicklas' program uses mobile devices such as cellphones to administer a specialized postpartum lifestyle intervention program for women with complicated pregnancies, including those with diabetes and preeclampsia.

## 2012

**Sangeeta Rana**, MPH, was one of 23 candidates named a Fulbright-Clinton Fellow. The Fulbright-Clinton Fellowship allows individuals to serve in professional placements as special assistants in foreign government ministries or institutions, and to gain hands-on public sector experience in participating foreign countries while simultaneously carrying out an academic research/study project. Through her fellowship, Rana will support evidence-informed policymaking and explore quality of care in rural primary health care centers.

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## AWARDS AND HONORS



**Caroline Buckee**, assistant professor of epidemiology and associate director at the Center for Communicable Disease Dynamics, was recognized by several media outlets for her work on mining cellphone data to track how people's movements correlate with the spread of malaria in Kenya. *MIT Technology Review* named her one of their annual "Innovators Under 35"; CNN named her to the "CNN 10: Thinkers" list; and *Foreign Policy* named her a "Top 100 Global Thinker."

**Karen Hacker**, associate professor in the Department of Social and Behavioral Sciences, was appointed director of the Allegheny County (Pennsylvania) Health Department.

**Frank Hu**, professor of nutrition and epidemiology, was named to the United States Department of Agriculture's and the Department of Health and Human Services' 2015 Dietary Guidelines Advisory Committee.

**Ashish Jha**, professor of health policy and management, and **Michelle Mello**, professor of law and public health, were elected to the Institute of Medicine (IOM). Election to the IOM is considered one of the highest honors in the fields of health and medicine and recognizes individuals who have demonstrated outstanding professional achievement and commitment to service.

**Stefanos Kales**, associate professor in the Department of Environmental Health, received the American College of Occupational and Environmental Medicine's 2013 Kehoe Award for Excellence in Education or Research in Occupational and Environmental Medicine. The award recognized his leadership in and contributions to the field.



**Nancy Krieger**, professor of social epidemiology, was awarded the Wade Hampton Frost Lectureship from the American Public Health Association's Epidemiology section. The award recognizes a person who has made a significant contribution to addressing a public health issue of major importance by applying epidemiologic methods.



**Laura Kubzansky**, professor of social and behavioral sciences, was elected to fellow status by the American Psychological Association (APA) and to the Academy of Behavioral Medicine Research (ABMR). APA bestows fellow status on "members who have shown evidence of unusual and outstanding contributions or performance in the

field of psychology." ABMR, "the premier honorary scientific organization for scientists working at the interface of behavior and medicine," elects fellows based on scientific productivity and recognition in the field.



**Quan Lu**, associate professor of environmental genetics and pathophysiology, received the 2013 Armen H. Tashjian Jr. Excellence in Endocrine Research Award. The Tashjian Research Award recognizes promising young faculty members and fellows at the School who are pursuing innovative research ideas in basic biomedical sciences.



**John Quackenbush**, professor of computational biology and bioinformatics, received a White House Open Science Champion of Change award in recognition of his efforts to ensure that vast amounts of genomic data are available, accessible, and useful. He was one of 13 people from across the nation to be honored at a June 20, 2013, ceremony at the White House.

*continued*

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## AWARDS AND HONORS *continued*



**Marc Roberts**, professor of political economy *emeritus*, was recognized for his 46 years of service to Harvard University at a symposium and retirement celebration. Roberts has taught economics, statistics, ethics, management, environmental policy, and health policy at Harvard's Faculty of Arts and Sciences, Harvard Kennedy School, Harvard Law School, and, for the last 30 years, at HSPH.

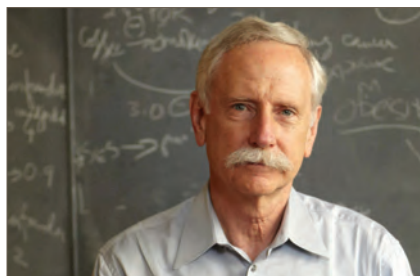
**James Robins**, Mitchell L. and Robin LaFoley Dong Professor of Epidemiology, was awarded the 2013 Nathan Mantel Lifetime Achievement Award from the American Statistical Association's Statistics in Epidemiology section for his work at the intersection of statistical science and epidemiology.



**Meredith Rosenthal**, professor of health economics and policy, was named chair of the board of directors of Massachusetts Health Quality Partners, a statewide health improvement collective.

**Jack Spengler**, Akira Yamaguchi Professor of Environmental Health and Human Habitation, was the keynote speaker for the May 6, 2013, launch of

Fit City Boston, an initiative by former Mayor Thomas Menino to examine how Boston's urban environment affects resident health and to form a plan to transform Boston into America's healthiest city.



**Walter Willett**, Fredrick John Stare Professor of Epidemiology and Nutrition, received the 2013 Bloomberg Manulife Prize for the Promotion of Active Health, awarded by McGill University in association with Lawrence and Frances Bloomberg and Manulife Financial. The award recognizes him as "the single-most-cited nutritionist in the world, and a sought-out expert on the topic of health and nutrition. Known for his strong criticism of policies and guidelines that fail to reflect the best scientific evidence, Willett has dedicated himself to pursuing research that can inform the public about how proper nutrition contributes to better health, and ultimately, a longer life."



**David Williams**, Florence Sprague Norman and Laura Smart Norman Professor of Public Health, was awarded the 2013 Stephen Smith Award for Distinguished Contributions in Public

Health from the New York Academy of Medicine. Williams was honored for his research on racial and socioeconomic differentials in health and his active engagement in public health policy through his work with the Robert Wood Johnson Foundation Commission to Build a Healthier America.

---

## APPOINTMENTS & PROMOTIONS

### **Peter Berman**

Faculty director, DrPH program

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Senior associate dean for research

### **Rafael Irizarry**

Professor of biostatistics

### **Laura Kubzansky**

Professor of social and behavioral sciences

### **Christoph Lange**

Professor of biostatistics

### **Quan Lu**

Associate professor of environmental genetics and pathophysiology

### **Brendan Manning**

Professor of genetics and complex diseases

### **Christina Roberto**

Assistant professor of social and behavioral sciences and nutrition

### **Meredith Rosenthal**

Associate dean for diversity

### **Reginald Tucker-Seeley**

Assistant professor of social and behavior sciences

### **Tyler VanderWeele**

Professor of epidemiology

### **Kasisomayajula "Vish" Viswanath**

Professor of health communication

### **Corwin Zigler**

Assistant professor of biostatistics



At left, Keizo Takemi, 2008 Takemi Fellow and son of Taro Takemi, with Michael Reich, director of the Takemi Program in International Health and Taro Takemi Professor of International Health Policy in HSPH's Department of Global Health and Population.

Below left: current Takemi Fellows Tae-Jin Lee, professor of public health at Seoul National University, and Nadia Spada Fiori, professor in the Department of Social Medicine at Brazil's Federal University of Pelotas.

Below right: current Takemi Fellows Sujin Kim, postdoctoral researcher at the Institute of Health and Environment, School of Public Health, Seoul National University, and Maryam Farvid, associate professor at Iran's Shahid Beheshti University of Medical Sciences.



For example, Marika Nomura-Baba, a current fellow sponsored by the JMA, has pursued both academic and fieldwork in public health at Japan's Juntendo University and in Yemen. Now she's using her fellowship year to analyze trends in global nutrition policy and how it might be moved up higher on Japan's development agenda. Another fellow, Maryam Farvid, an associate professor at Iran's Shahid Beheshti University of Medical Sciences, is eager to absorb all the latest research from HSPH's Department of Nutrition, which she will apply back home in her work on food policy.

Fellows Shinichi Tomioka, a Japanese physician, and Tae-Jin Lee, a professor of public health at Seoul National University, are gaining perspective on their own countries' health systems by exploring what does and doesn't work in the United States and elsewhere. From courses and weekly seminar presentations by HSPH faculty to informal discussions with other fellows to following the ongoing debate over the Affordable Care Act, the experience has been illuminating, says Tomioka. "Takemi is like a candy store. There are so many things we can do and experience."

The Takemi name carries prestige in global health circles, Reich adds, and fellows maintain their connections with the program and with each other after they leave. Nearly 80 fellows—about a third of past participants—returned to HSPH last fall for a symposium celebrating the Takemi Program's 30th anniversary. According to HSPH Dean Julio Frenk, the Takemi Program's approach—providing protected time for midcareer professionals, creating an interdisciplinary global community of scholars—exemplifies the School's new strategy for public health education. "The Takemi Program has been hugely important for Harvard School of Public Health."

And hugely important for public health generally. "Many of the fellows see each other at global health meetings around the world. Sometimes they meet a participant at one of these events and discover that they are both Takemi Fellows," says Reich. "At almost any major health meeting around the world, you'll find that those participating in key roles are Takemi Fellows."

*Amy Roeder is assistant editor of Harvard Public Health.*



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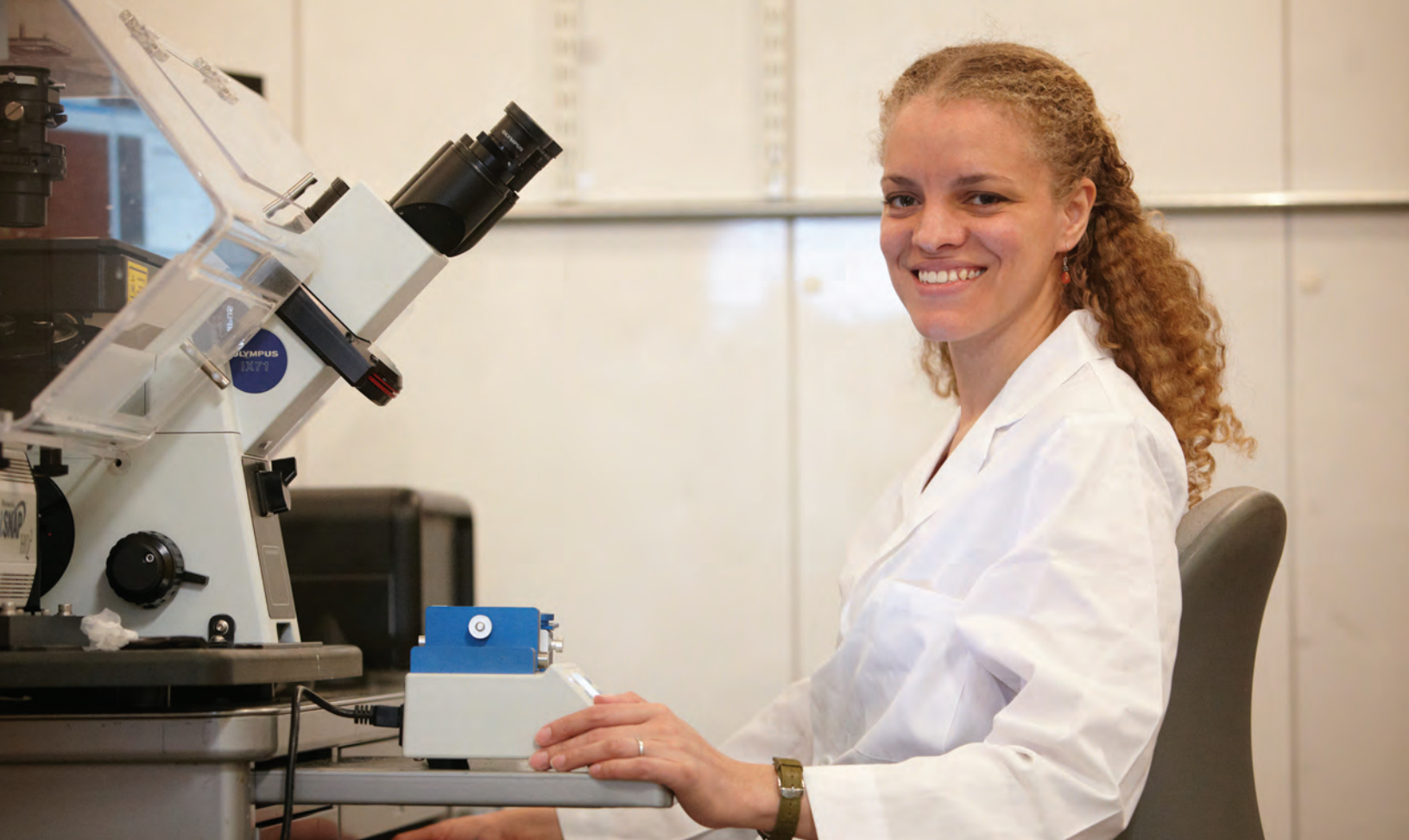
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In our “Why Public Health?” series, we ask Harvard School of Public Health students to talk about why they chose to enter the field.

*“From a young age, I’ve always been interested in helping people. It wasn’t until I was in my 20s that I realized I could combine my passion for science, my desire for creativity, and my strong need to help people into a single career. I’m interested in studying tuberculosis because two million people a year are killed by it and about a third of the world’s population is infected with it. Aside from that, very little is known about how the TB bacterium behaves. For a bench researcher, it’s wide-open territory. It’s a whole new world. And that’s really exciting.”*

*—Jemila Kester, PhD '17, Biological Sciences in Public Health*

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