

# Columbia Public Health

DISPARITIES FIX  
Social Justice

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GLOBAL GAG RULE  
Tough Talk

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RESEARCH-BASED  
Implementation

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# ON TARGET

SCHOLARS PUT

**PRECISION PUBLIC HEALTH**

IN THEIR SIGHTS

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# FOOD PUBLIC HEALTH AND SOCIAL JUSTICE

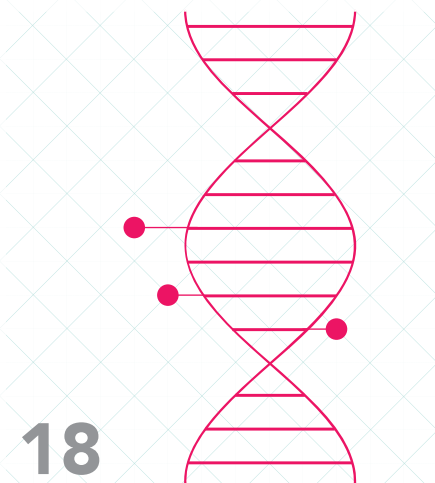
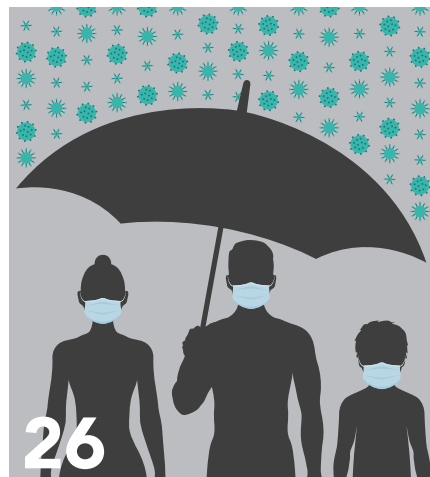
Join best-selling author, journalist, and lecturer in Health Policy and  
Management **MARK BITTMAN** and guest experts in this weekly series.

**Mondays, 6:00–7:30 p.m.**

Vagelos Education Center  
104 Haven Ave., NYC

- 9/11 Dean Linda P. Fried, MD, MPH, and Mark Bittman, Columbia University Mailman School of Public Health
- 9/18 Ricardo Salvador, PhD, Union of Concerned Scientists
- 9/25 Leah Penniman, Soul Fire Farm, Greg Asbed, Coalition of Immokalee Workers/Fair Food Program, and Jose Oliva, Food Chain Workers Alliance
- 10/2 Anna Lappe, Small Planet Institute, and Navina Khanna, HEAL Food Alliance
- 10/9 Bill McKibben, 350.org
- 10/16 Daisy Freund, ASPCA, Bob Martin, Johns Hopkins Bloomberg School of Public Health, and Paul Greenberg, The Safina Center
- 10/23 Comm. Mary T. Bassett, MD, MPH, NYC Dept. of Health & Mental Hygiene
- 10/30 Rep. Chellie Pingree, U.S. Congress
- 11/6 Timothy A. Wise, Tufts University, Jennifer Clapp, PhD, University of Waterloo in Ontario, and Rajasvini Bhansali, Thousand Currents
- 11/13 Nick Saul, Community Food Centres Canada
- 11/20 Tom Colicchio, Food Policy Action and Top Chef, Paula Daniels, L.A. Food Policy Council, and Kathleen Finlay, Glynwood and Pleiades

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# Public Health Is a Public Good



*Accepting population health as a public good can be the basis for developing and aligning effective investments for prevention, innovation, and access to care.*



In the world's first modern economic treatise, *The Wealth of Nations*, Adam Smith introduced the principle of public goods—things that, in his words, “may be in the highest degree advantageous to a great society, but are, however, of such a nature that the profits could never repay the expense to an individual or small number of individuals, and which it therefore cannot be expected that any individual or small number of individuals can erect.” Lighthouses, bridges, and canals made Smith's list. So, too, did “the most essential parts of education.”

Nearly 250 years later, Americans prize an array of public goods: our national parks, public transportation, clean air. In economic parlance, such goods are both available to and beneficial for all. Take clean air—anyone can inhale, and one person's respiration does not deprive others of similar benefit.

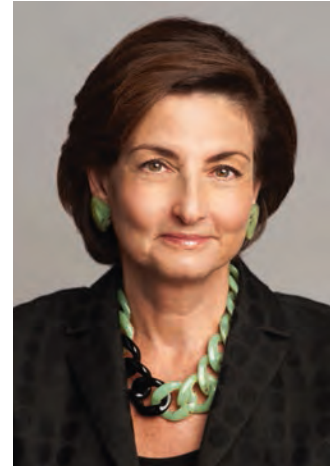
Let me then be so bold as to propose another public good: population health. Smith may have been a moral philosopher, but at its core, his take on the public good was strictly economic. Public goods spur commerce; illness erodes economic productivity. On that count alone, population health demands our attention.

Consider malaria. From 1965 to 1990, more than one-third of the nations worldwide with intensive malaria had negative rates of economic growth; malaria-free countries boasted, on average, a 2.3 percent rate of growth. Closer to home, the Mailman School's own Peter Muennig, MD, PhD, has quantified the opportunity costs that accrue when children suffer low-level lead exposure: nearly \$400 million in Flint, Michigan, alone.

Both internationally and domestically, chronic disease exerts a similarly corrosive economic effect. Fully 86 percent of all healthcare spending in the U.S. in 2010 was for people with one or more chronic medical conditions—cardiovascular and lung diseases, diabetes, cancer, and the like. Such noncommunicable diseases, or NCDs, are the leading cause of disability and death worldwide. Half of those deaths are preventable, and the costs of inaction dwarf the costs of intervention. According to the nonprofit NCD Alliance, NCDs in developing countries will cost \$7 trillion over the next 20 years, while the annual implementation costs of a set of high-impact preventive interventions is just \$11 billion. Yet NCDs receive less than 2 percent of development assistance for population health.

Evidence-based prevention science underpins the implementation of proven health promotion efforts. Yet despite its potential for well-being in the 21st century and beyond, the U.S. has failed to prioritize funding for public health research or the interventions informed by such inquiry.

Public goods—including population health—require public support and investment by every sector. The returns on investment are high and accrue to all. Accepting population health as a public good can be the basis for developing and aligning effective investments for prevention, innovation, and access to care. It's time to support population health as a global public good—for we will all bear the consequences of inaction.



Dean Linda P. Fried, MD, MPH



## GOLDEN OPPORTUNITY

\$10.3 MILLION FOR "URBAN SANCTUARY"



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MANHATTAN DISTRICT ATTORNEY CYRUS R. VANCE JR. HAS AWARDED \$45.9 MILLION TO CREATE FIVE NEIGHBORHOOD-BASED "YOUTH OPPORTUNITY HUBS" AS PART OF HIS OFFICE'S CRIMINAL JUSTICE INVESTMENT INITIATIVE. The four-year, \$10.3 million award to the Washington Heights hub will be co-led by Alwyn T. Cohall, MD, professor of Sociomedical Sciences and Population and Family Health, and director of the Harlem Health Promotion Center.

"I am delighted to accept this grant, which will help build upon our work on incarceration and public health—particularly as it relates to prevention—creating an 'urban sanctuary' for high-risk youth, to reduce their involvement in the criminal justice system," says Cohall. "The award represents a concrete example of interdisciplinary collaboration among faculty at NewYork-Presbyterian, the New York State Psychiatric Institute, and the Mailman School of Public Health, along with a network of community-based organizations. Additionally, I envision this project as an extraordinary opportunity for student involvement across our campus."

Cohall's areas of research include adolescent health; reproductive health; violence; access to healthcare, particularly for young

men of color; and health communication/health promotion. A board-certified pediatrician and adolescent medicine physician, Cohall also directs Project STAY (Services to Assist Youth), a New York State Department of Health-funded program that provides confidential health services to young people affected by or infected with HIV/AIDS. He is also medical director of the New York City STD Prevention Training Center, one of eight centers funded by the Centers for Disease Control and Prevention to enhance the skills of health providers working with patients who have sexually transmitted infections. With his wife, Renee Cohall, LCSW-R, he is co-director of BeWell Health and Wellness, which supports young people involved in BridgeUP, an academic enrichment program housed in five New York Public Library sites.

"The role of law enforcement in the 21st century is not merely to arrest and prosecute," said Vance in his announcement. "By creating attractive spaces offering one-stop resources and serving thousands of additional young people and families, we can help build the strongest generation of New Yorkers yet." 🏆

### HONOR ROLL

#### A SAMPLING OF AWARDS

✦ The Mailman School's **Initiative for Maximizing Student Development (IMSD)**, awarded funds for eight doctoral students by the National Institute of General Medical Sciences of the National Institutes of Health.

✦ **DuBois Bowman**, PhD, chair of Biostatistics, recipient of the department's first endowed professorship: the Cynthia and Robert Citrone-Roslyn and Leslie Goldstein Professorship in Biostatistics.

✦ **Sandro Galea**, MD, MPH, DrPH '03, adjunct professor of Epidemiology and Robert A. Knox Professor and Dean at the Boston University School of Public Health, awarded the 2017 Allan Rosenfield Alumni Award for Excellence.

✦ **Wafaa El-Sadr**, founding director of ICAP and Dr. Mathilde Krim-amFAR Chair of Global Health, inducted as an honorary member to Sigma Theta Tau, one of the largest nursing organizations in the world.





## A TIME TO TEACH

FEDERAL POLICY IN THE SPOTLIGHT

IN JANUARY, ANTICIPATING MAJOR POLICY CHANGES FROM THE TRUMP ADMINISTRATION, HUNDREDS OF FACULTY, STUDENTS, AND STAFF GATHERED FOR “EVIDENCE INTO ACTION,” A DAYLONG TEACH-IN WITH CONCURRENT EVENTS HOSTED ACROSS THE COLUMBIA UNIVERSITY MEDICAL CENTER CAMPUS. Mary T. Bassett, MD, MPH, commissioner of the New York City Department of Health and Mental Hygiene, gave opening remarks. As public health braces for “an assault on all the protections and safety nets that many of us have been advocating for our entire lives,” she said, “it’s important that we come together and confront these challenges.” Breakout sessions featured discussions on the Affordable Care Act; climate change, pollution, and the Environmental Protection Agency; immigration and the humanitarian implications of a wall on the U.S.-Mexico border; and the concern that science itself is under attack. “This is our intervention on ourselves to ensure we’re all informed with relevant knowledge and data,” said Dean Linda P. Fried, MD, MPH, adding that the teach-in would be a foundation for continued work in the weeks and months ahead. “Today must not—and will not—be the end of the conversation; it is the beginning.” 📖

## HONOR ROLL

\* **Merlin Chowkwanyun**, PhD, Donald H. Gemson Assistant Professor of Sociomedical Sciences, awarded the 2017 Mailman School Teaching Excellence Award.

\* **John Rowe**, MD, Julius B. Richmond Professor of Health Policy and Aging in Health Policy

and Management and former chair of the Mailman School’s Board of Overseers, elected president of the International Association of Gerontology and Geriatrics’ 21st Congress.

\* Calderone Junior Faculty Award recipients: **Alamy Kante**, PhD

## SOCIAL STUDIES

\$3 MILLION FOR HIV PREVENTION

ACCORDING TO A PILOT STUDY BY MARK HATZENBUEHLER, PHD, ASSOCIATE PROFESSOR OF SOCIOMEDICAL SCIENCES, structural stigma—societal conditions, cultural norms, and institutional policies that constrain the resources and opportunities of stigmatized individuals—plays a significant role in HIV risk among gay and bisexual men. This summer, the National Institutes of Health awarded Hatzenbuehler a five-year, \$3 million RO1 grant to extend his study of how structural stigma relates to HIV prevention outcomes.

Hatzenbuehler, who co-directs the Mailman School’s Center for the Study of Social Inequalities and Health, plans a prospective study with a nationally representative sample of 500 gay and bisexual men who know they are HIV-negative or do not know their HIV status.

A series of surveys will investigate whether a person’s risk of becoming HIV-positive during the study period corresponds to structural stigma against sexual minorities through local “sanctity of marriage” laws, reduced housing and employment protections for LGB people, and the like. Hatzenbuehler also plans to track possible mechanisms by which structural stigma undermines HIV-prevention activities, thereby raising the risk of infection. The research team will also

conduct in-depth interviews with 60 study participants, seeking out ways that the men buffer their experience of structural stigma—through social connection within their local LGB community, for example.

This project extends the scholar’s ongoing investigations into the causes of health disparities related to sexual orientation, the health consequences of exposure to structural forms of stigma, and the identification of biological, psychological, and social mechanisms linking stigma to adverse health outcomes. His recent work has examined how policies that protect the civil rights of sexual minorities, such as same-sex marriage laws, employment nondiscrimination policies, and anti-bullying policies, affect the health of LGB populations. 📖

## IN PRINT

1ST TEXTBOOK ON  
POPULATION HEALTH

IN AUGUST 2016, OXFORD UNIVERSITY PRESS PUBLISHED *POPULATION HEALTH SCIENCE*, THE FIRST TEXTBOOK TO FORMALIZE THE EMERGING FIELD. CO-AUTHORED BY KATHERINE KEYES, MPH ’06, PHD ’10, ASSOCIATE PROFESSOR OF EPIDEMIOLOGY, AND SANDRO GALEA, MD, MPH, DRPH ’03, DEAN OF THE SCHOOL OF PUBLIC HEALTH AT BOSTON UNIVERSITY AND ADJUNCT PROFESSOR OF EPIDEMIOLOGY AT THE MAILMAN SCHOOL, THE 200-PAGE, 14-CHAPTER TITLE COVERS THE INTERPLAY AMONG SOCIAL AND MEDICAL SCIENCES, DEMOGRAPHY, AND ECONOMICS, COMPLETE WITH CASE STUDIES, AND OFFERS NINE THEORETICAL PRINCIPLES FOR THE FIELD. 📖

(Population and Family Health), **Marianthi-Anna Kioumourtzoglou**, ScD (Environmental Health Sciences), **Gen Li**, PhD (Biostatistics), **Christine Mauro**, PhD ’14 (Biostatistics), **Nischay Mishra** (Center for Infection and Immunity), and **Rafal Tokarz** (Center for Infection and Immunity).

\* **Linda P. Fried**, MD, MPH, dean and DeLamar Professor of Public Health at the Mailman School, honored with the 2016 Inserm International Prize, given each year by the French National Institute of Health and Medical Research (Inserm), a counterpart of the U.S. National Institutes of Health.

# FOOD FOR THOUGHT

MARK BITTMAN LECTURES

"WE WANT TO EXAMINE WHAT FOOD POLICY WOULD LOOK LIKE IF IT WERE GUIDED BY PUBLIC HEALTH CONCERNS."

**F**OR FOUR DECADES, MARK BITTMAN HAS BEEN THINKING—and writing—about food. In recent years, the acclaimed cookbook author and longtime *New York Times* columnist has zeroed in on the connections between food, health, and social justice.

A member of the Health Policy and Management faculty, Bittman expanded the conversation this fall as host of a public lecture series that emphasizes justice and health, sampling such issues as meat production and global climate change, pervasive low wages in the food industry, pesticide exposures on factory farms, and how soft drinks, poor nutrition, and obesity are linked. "We want to invite people to think about the larger food system in the U.S. and around the world," says Bittman, "how we got here, and what we need to do to move toward a food system that is equitable."

Speakers for the Monday evening series include environmentalist Bill McKibben, New York City Health Commissioner Mary T. Bassett, MD, MPH, Rep. Chellie Pingree of Maine, and chef Tom Colicchio. Topics will include land use and food security; animal diets and ecosystems; and race, class, and immigration in food production. Lectures and panel discussions will examine long-term trends—the development of agriculture, for example—as well as contemporary policy issues.

The talks, as well as an accompanying

course for students in the master's program, endeavor to imagine a better way of doing things. "We want to examine what food policy would look like if it were guided by public



health concerns, fairness, [and] the interest of the people it should be serving," says Bittman. The food justice course—limited to 20 Mailman School students—will cover the global food system. Bittman, who previously taught journalism, spent months developing the syllabus and lining up speakers. "This is really the course I want it to be," he says. "I'm excited to make it happen." [@](#)

## BREAST DENSITY UNDER SCRUTINY

2 NIH-FUNDED STUDIES

tissue. National estimates find that more than 40 percent of screened women aged 40 to 74 have mammograms that show dense breasts. "It's one of the strongest independent risk factors for breast cancer," says Parisa Tehranifar, DrPH, assistant professor of Epidemiology. "And large amounts of dense breast tissue also interfere with detection, making it harder for mammograms to pick up tumors."

Twenty-seven states now mandate that if screening reveals a woman has dense breasts, she must be notified as part of her mammogram report. With a \$2.78 million grant from the National Institute on Minority Health and Health

**OVER THE COURSE OF THE LAST 20 YEARS, MAMMOGRAM SCREENING RECOMMENDATIONS HAVE BEEN A MOVING TARGET.**

Among the controversies has been the relevance of breast density, the percentage of fatty tissue relative to dense, fibroglandular

Disparities, Tehranifar will follow 1,000 women screened in Washington Heights to explore what they know about breast density, how they feel about their screenings, how well they understand their results, and what healthcare they pursue in response to their mammogram reports. She plans to focus on differences across racial, ethnic, or socio-economic groups. "We need to know if the information is being used differently depending on education level, health literacy, access to coverage, or income," Tehranifar says. "Disparities can take a while to develop, but we may be able to predict them and possibly prevent them from developing in screening and early detection."

With separate funds from the National Cancer Institute, Tehranifar and colleagues will tap into the Sister Study, a ten-year prospective study of more than 50,000 women with sisters who have had breast cancer. Researchers already have a wealth of data on the women, but no mammographic data. To fill this gap, Tehranifar and her colleagues will collect a series of mammograms for the study participants to document changes in each woman's breast density over time and assess whether these trajectories can improve breast cancer risk assessment. [@](#)



# THE BIG QUESTION

RAYGINE DIAQUOI



Raygine DiAquoi, EdD

"I BELIEVE IN  
A SOCIAL JUSTICE  
APPROACH TO  
PUBLIC HEALTH  
AND EDUCATION."

AS A GRADUATE STUDENT AT HARVARD, RAYGINE DIAQUOI, EdD, DUG INTO "THE TALK"—THE CONVERSATION THAT GENERATIONS OF AFRICAN-AMERICAN PARENTS HAVE HAD WITH THEIR CHILDREN ABOUT RACISM, INCLUDING WARNINGS ABOUT INTERACTIONS WITH LAW ENFORCEMENT—AND HOW THAT DISCUSSION HAS EVOLVED OVER THE LAST FEW CENTURIES. Her sobering finding: The messages parents are sharing with their children today resemble those from Jim Crow—a reflection of the structural racism of mass incarceration and policing that disproportionately affects people of color. As director of the Office of Diversity, Culture, and Inclusion (ODCI), the assistant professor of Sociomedical Sciences invites the Mailman School community to lean into the difficult work of examining power and privilege. Says DiAquoi: "We need to be committed to each other's learning and growth around these issues."

**What successes are you celebrating in your first year at ODCI?** Faculty, staff, and students are coming to the office, thinking about how issues of inequity intersect with their work, and asking about ways they can be involved in co-creating an inclusive community at the School.

**You champion introspection as an antidote to oppression. Why?**

My thinking around the importance of reflection draws heavily on the writing of education theorists Maxine Greene and David Kolb. When it comes to understanding systemic inequity, introspection is the bulk of the work. To create new paths forward for everyone, we have to reflect critically, alone and together, on how we benefit from social-group hierarchies that disadvantage others. Such introspection often causes discomfort, which inspires action.

**What does that look like in your life?** Critical reflection is a part of my practice. To process, I take time to jot down notes about what I've experienced, making parallels to prior experiences—my own and those of others—and theory. I don't have a ton of time, so I'm often quickly typing thoughts into my notes app on my phone or quickly scribbling something onto a Post-it. These notes are often the seeds for programming.

**In your email signature, you state your pronouns in use (she, her, hers). Why?** I get asked this a lot. ODCI programming focuses on raising awareness around the ways that inequity manifests at the societal, cultural, and individual levels. Having pronouns in my signature has opened up many conversations about the ways that we, as individuals, can create environments

that are more gender-inclusive and leads to discussions about what it means to keep inclusion at the forefront of our minds.

**Your approach echoes the mantra that the personal is political.** People's narratives are very important. I encourage people to think about the relationship between the self and broader social, political, and historical events. Our stories are the best points of entry for understanding the way that systems operate.

**And how does it all tie in with public health work?** It's easy to talk about health disparities beyond our walls, but an important part of the work is being open to analyzing the conditions within our own institution. We start with ourselves. It's difficult work to look as deeply as we need to look to make the changes that we need to make, and our community has embraced that project. [@](#)



# DATA points



## Follow the Money

**W**hen President Donald Trump submitted his first budget to Congress, he proposed a reduction of nearly 20 percent—\$6 billion—in 2018 funding for the National Institutes of Health. Such belt-tightening carries a cost, says Bhaven Sampat, PhD, associate professor of Health Policy and Management, whose analysis shows that 30 percent of all NIH-funded grants produce research that is subsequently cited by a private-sector patent. *Science* published the resulting paper, co-authored with collaborators at Harvard Business School, MIT Sloan School of Management, and the National Bureau of Economic Research.

The NIH, the world's largest single funder of research in the life sciences, provides support for one-third of biomedical research and development in the U.S. as well as the majority of funding for basic biomedical research.

The team found that such publicly funded inquiry yields insights that spur efforts by private companies to develop drugs, medical devices, and other patented biomedical products.

In addition to their analysis of the output of research grants awarded by the NIH over a 27-year period, the team also reported their novel method to reveal links between public research investments and their commercial applications.

They also examined linkages between NIH grants and patents associated with marketed drugs. They found that about 10 percent of NIH grants directly generate a patent. Another 30 percent yield articles that are subsequently cited by commercial patents. "Focusing solely on the direct patent output of NIH funding," the authors write, "may dramatically understate its importance for producing research that informs commercial innovation."



## Immune Response

Scientists at the Mailman School's Center for Infection and Immunity (CII) have discovered immune signatures differentiating two subgroups of myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS). This complex, debilitating disease is characterized by symptoms including extreme fatigue after exertion, difficulty concentrating, headaches, and muscle pain. In "classical" ME/CFS, symptoms begin suddenly following a flu-like infection. However, a subset of cases classified by the investigators as "atypical" follow a different disease course, either from triggers preceding symptoms by months

or years, or accompanied by the later development of additional serious illnesses. The study, published in *Translational Psychiatry*, may help clinicians personalize treatment for people with ME/CFS.

A second CII paper on ME/CFS reports abnormal levels of specific gut bacteria related to ME/CFS in patients with and without concurrent irritable bowel syndrome (IBS), which affects up to 90 percent of ME/CFS patients. The study, published in *Microbiome*, is among the first to unravel imbalances in the gut bacteria of people with ME/CFS and IBS.

## Death and Taxes

Since its inception, the earned income tax credit (EITC) program has lifted 9 million Americans out of poverty. The EITC is

### TAX CREDIT

**+2.2**  
YEARS IN GOOD  
HEALTH

good for people's pocketbooks and even better for their health, according to research by Peter Muennig, MD, MPH '98, professor of Health Policy and Man-

agement, and colleagues, in the *American Journal of Preventive Medicine*. The team showed that EITC is much more cost-effective than many health interventions. They further documented its effect of reversing mortality trends among Americans with low incomes in some states that have been experiencing increases in mortality in recent years. "EITC might just be the bipartisan answer to both the problems of declining life expectancy and declining wages among lower-income Americans," says Muennig. "But we still need experiments to be sure that it really does what we think it does."



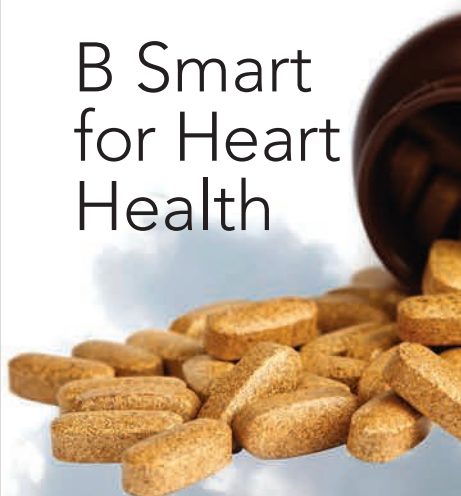
photo courtesy of Nurse-Family Partnership

## Abundance Amidst Scarcity

IN THE REPORT *STRONG AT THE BROKEN PLACES: THE RESILIENCY OF LOW-INCOME PARENTS*, THE MAILMAN SCHOOL'S NATIONAL CENTER FOR CHILDREN IN POVERTY (NCCP) DOCUMENTS THE STRENGTHS AND COPING SKILLS OF PARTICIPANTS IN THE FRAGILE FAMILIES AND CHILD WELL-BEING STUDY. Children who reported high levels of parental involvement and supervision were more likely to also report behaviors associated with positive emotional development and social growth. The study shows that parents with low incomes help their families flourish amidst the environmental stressors associated with poverty. "They raise children who possess the social-emotional competence needed to develop and keep friendships; establish good relationships with parents, teachers, and other adults; and experience a range of achievements that contribute to their self-confidence, self-esteem, and self-efficacy," says report co-author Renée Wilson-Simmons, DrPH, director of the NCCP.

"THESE FAMILIES HAVE SOMETHING TO TEACH US ALL ABOUT THRIVING AMIDST ADVERSITY."

## B Smart for Heart Health



### Ambient fine-particulate pollution spurs 3.7 million premature deaths annually worldwide,

predominantly through acute effects on the cardiovascular system. B vitamins can mitigate those effects, according to a clinical trial overseen by Andrea Baccarelli, MD, PhD, chair and the Leon Hess Professor of Environmental Health Sciences. Healthy nonsmokers who took vitamin B supplements nearly reversed any negative effects on their cardiovascular and immune systems, weakening the effects of air pollution on their heart rate by 150 percent, their total white blood cell count by 139 percent, and their lymphocyte count by 106 percent. The findings were published in *Scientific Reports*. A second study, published in *PNAS*, suggests that the effects may be due to the role of vitamin B in gene expression.

# Mind Altering

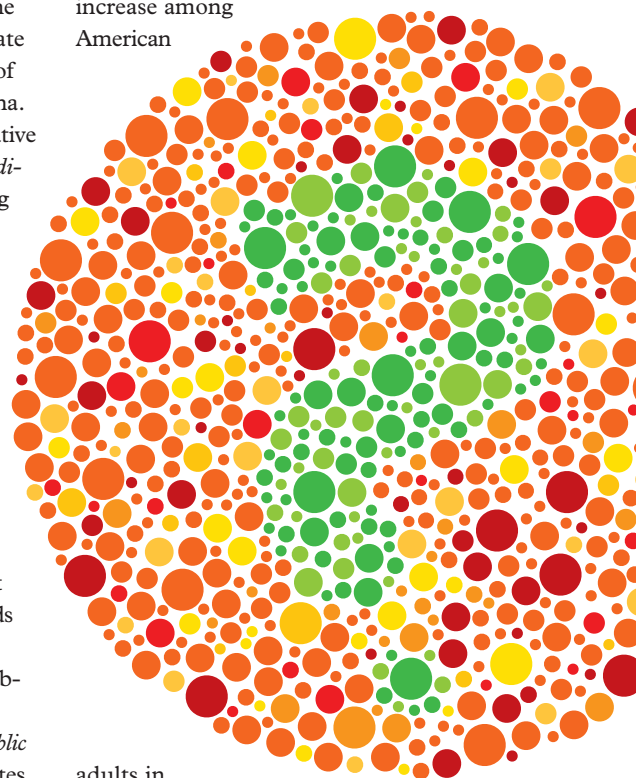
Building an evidence-based understanding of addiction is a critical piece of the Mailman School's mission, particularly in light of the nationwide epidemic resulting from the converging economic, legal, and social dimensions of substance use.

Epidemiologists Deborah Hasin, PhD, and Silvia Martins, PhD, continued their scrutiny of marijuana and opioids over the past year, collecting data to inform legislators intent on crafting evidence-based policy, and program managers committed to tailoring interventions for optimal effect. Much of the research explores the impact of rapidly changing state-by-state legislation governing the sale and use of both medical and recreational marijuana.

Hasin compiled a series of comparative analyses—published in *JAMA*, *JAMA Pediatrics*, and *JAMA Psychiatry*—investigating differences in cannabis use and abuse by gender, age, and socio-economic status, as well as the effect of medical marijuana legislation on behavior and attitudes. In another analysis, published by *Drug and Alcohol Dependence*, her team found that the gender gap has widened. More men reported past-year use than women, and since 2007, the rate of increase was greater for men than for women. The researchers also found that the trend was driven solely by households earning less than \$50,000 a year.

Martins investigated an array of substances and their use at work and on the road. In the *American Journal of Public Health*, she reports that, on average, states which had enacted medical marijuana laws experienced reductions in traffic fatalities. *Addiction* published her finding that marijuana use varies widely by geography, with adult usage rising significantly in states that passed loosely regulated medical marijuana laws. Her report in *Social Psychiatry and Psychiatric Epidemiology* details the relationship between employment status and

nonmedical prescription drug use among people over the age of 25. Unemployed workers had the highest risk of misusing prescription opioids. By contrast, those out of the workforce entirely were most at risk for misusing prescription stimulants. In *JAMA Psychiatry*, Martins quantified the increase among American



adults in heroin use and associated disorders since 2001: Clinically defined addiction has tripled. Increases were greatest among males, whites, and those with low incomes and little education. The rise in the prevalence of heroin use disorder was more pronounced among whites ages 18–44 than among nonwhites and older adults.



## The Reformation

Even as political rhetoric over the Affordable Care Act (ACA) flared, Health Policy and Management faculty continued analyzing outcomes of the law and documenting Americans' attitudes toward health insurance reform.

In a *Health Affairs* report, Assistant Professor Adam Sacarny, PhD, examines how personalized letters and emails might encourage enrollees in the ACA marketplaces to shop for health insurance plans that save them money and better meet their needs. The study was a randomized controlled trial involving 15,000 households in Colorado. "While we can say with confidence that the messages encouraged people to shop," says Sacarny, "the results also show that simply increasing awareness may not lead consumers to change plans."

In March, Professor Peter Muennig, MD, MPH '98, and colleagues released the results of a survey on healthcare afford-



ability. In response to the speed with which a legislative overhaul was being pursued in Congress, the team published on *SocArXiv*, a website for the rapid dissemination of science, rather than in a traditional health policy journal. "Americans feel that everyone can afford to put about 5 percent of their household income toward health insurance and strongly favor a credit linked to the income that one makes," says Muennig. "They also do not favor placing extra burdens on the sick or elderly."

Assistant Professor John McHugh, MBA, PhD, whose work melds strategic consulting and entrepreneurship, turned his eye to the networks of providers known as Accountable Care Organizations (ACO), conceived to coordinate care and boost quality while containing costs. His *Health Affairs* report showed that ACO member hospitals reduced readmission rates faster than their non-ACO peers. "There's a real need within the research community to accelerate, to look at the incentive programs to understand what's working, and speak up about them," says McHugh. "Make sure voices are heard, that evidence is known and followed, and keep fighting."

## Teen Talk

With 1.8 billion teens worldwide, the time is ripe for better data on adolescent health. To facilitate research, John Santelli, MD, MPH, professor of Population and Family Health, serves as editor of a series of UNICEF briefs that examine a variety of challenges facing investigators, including practical considerations about data sources and ethical concerns. In a separate paper in the *Journal of Adolescent Health*, Santelli and co-authors credit such economic trends as rising national wealth and expenditures on education for declining rates of adolescent fertility, which dropped by 40 percent from 1990 to 2012, worldwide.

Sadly, the news for young women isn't all good. Marni Sommer, DrPH '08, associate professor of Sociomedical Sciences, has found that, like girls in higher-

income nations, girls in less economically developed nations are more likely to have sex, take sexual risks, and marry young if they menstruate early. Stateside, Sommer reports, girls from low-income families are unprepared for puberty and have largely

negative experiences of the transition. In the *Journal of Global Health*, Lindsay Stark, MPH '06, DrPH '10, associate professor of Population and Family Health, documents widespread violence against teen girls in Africa.



School girls, Kebribeyah Camp, Ethiopia.  
Photo by Lindsay Stark.



## Risk Assessment: Autism

THREE PAPERS FROM THE MAILMAN SCHOOL'S CENTER FOR INFECTION AND IMMUNITY (CII) EXPLORE THE ASSOCIATION OF PRENATAL EVENTS WITH THE RISK OF A CHILD BEING DIAGNOSED WITH AUTISM SPECTRUM DISORDER (ASD). Fever during pregnancy may raise the risk for ASD, according to a *Molecular Psychiatry* report. In an *mSphere* paper, researchers detail mixed evidence of a link between maternal influenza and ASD. A second *mSphere* paper reports that women actively infected with genital herpes (HSV-2) during early pregnancy have twice the odds of giving birth to a child later diagnosed with ASD.

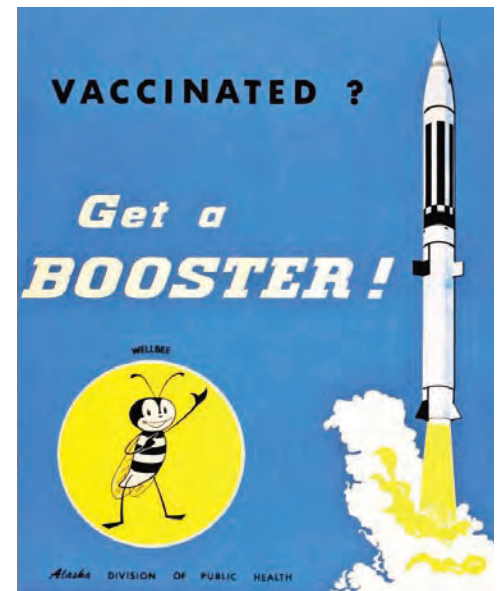
A study unrelated to the CII investigations, by Professor of Epidemiology Guohua Li, DrPH, MD, reveals that deaths of people with autism had increased 700 percent in the past 16 years and, compared with the general population, were three times as likely to have been caused by injuries.

## Against Medical Advice

In an op-ed for the *New England Journal of Medicine*, public health historian James Colgrove, MPH '09, PhD '04, professor of Sociomedical Sciences, reflects on the mix of coercion and persuasion that has characterized vaccination campaigns since the 19th century, when state and local governments struggled to protect Americans from smallpox.

Today, vaccine promotion is complicated by the Internet and social media, which make it possible for any one viewpoint, whether scientifically accurate or not, to gain traction. Trying to counter misinformation can have a boomerang effect, says Colgrove: The more health officials push back, the more likely a bogus theory is to stick in people's minds.

With vaccination rates falling, some parts of the country have seen a return of more coercive tactics. California, for



The CDC's national symbol of public health in 1964, the "Wellbee," promoted vaccination booster shots. CDC/Mary Hilpertshauer, 1964.

example, has outlawed nonmedical exemptions from childhood vaccinations.

Colgrove champions education and training, especially for primary care providers, the key influencers when people are making decisions about vaccinations. "It's a challenge," the scholar says, "but also an opportunity."

## Sports Medicine

CHILDREN FROM URBAN AREAS OF NEW YORK CITY WHO ENGAGED IN VIGOROUS DAILY EXERCISE HAD GREATER EXPOSURE TO BLACK CARBON, A TRAFFIC-RELATED POLLUTANT, THAN CHILDREN WHO WERE LESS ACTIVE, according to a study by a joint team of researchers from the Mailman

School and Columbia's College of Physicians & Surgeons, published in the journal *Environmental Research*.

"This study's findings clearly add to evidence that physical activity may benefit the respiratory health of children," says Rachel Miller, MD, professor of Environmental Health Sciences and professor of Medicine (in Pediatrics) at CUMC. "But exposure to high levels of black carbon may lessen this effect."



The background is a textured, light brown paper with a large, irregularly torn edge on the right side. This torn edge reveals a dark purple color underneath. In the bottom right corner, there are two overlapping curved shapes: a brown one on top and a green one on the bottom.

# **Justice For All**

## A Population Approach to Health Disparities

By Jasmine Banks & Sharon Tregaskis

Illustrations by Alex Nabaum





# Social justice dominated the national news in 2017. Immigration. Transgender rights. White supremacy. The need has never been greater for scholarly research to reveal how stigma and oppression shape America's stark health disparities and how to eliminate them.

Gina Wingood, ScD, MPH, was just launching her career when she landed a job in the late 1980s promoting HIV prevention among black women in southeast San Francisco. She'd previously worked with gay men in the Castro neighborhood, but the condom-promotion materials developed for their needs missed the mark with her new clients. "Women have to negotiate condom use," she says, "which is a very hard thing to do."

In the intervening three decades, Wingood—founding director of the Mailman School's Lerner Center for Public Health Promotion and the Sidney and Helaine Lerner Professor of Sociomedical Sciences—has published more than 225 peer-reviewed papers detailing the evidence she's collected to inform gender- and culture-appropriate HIV prevention interventions. Her initiatives include Sisters Informing Sisters about Topics in AIDS (SISTA) and five other HIV prevention programs, all of which have been endorsed by the U.S. Centers for Disease Control and Prevention and implemented nationwide.

Each program helps participants confront stigma—the stigma of HIV, of condom use, of being a black woman in a society

that affords greater power to men, to those with white skin. Ultimately, says Wingood, problem-solving and communication skills are vital inflection points. "If you can't communicate what you need," she says, "that's not going to work."

Nationwide, HIV rates are falling. But in the South—especially among people of color—the epidemic has rebounded. And so Wingood has begun tailoring programs like SISTA to the places where people need them most. One project addresses the needs of youth in criminal detention. Another engages predominantly black megachurches in ZIP codes where HIV infection rates are particularly high.

"If innovation isn't reaching the community," she says, "we're going to take it to the community."

Here, too, Wingood and her team have collected the data to address participants' values and needs. And as she's spent more

time with faith leaders, a new project has emerged to tackle the burgeoning rate of diabetes among blacks, especially in the South. Like HIV, diabetes comes with a stigma, and social influence helps people overcome the barriers to testing. The nascent project brings high-tech equipment for diagnosing diabetes into churches, where clergy and lay leaders model how quick and relatively painless the blood sugar test is, inviting congregants to join them on the path to prevention and, if needed, earlier, more effective treatment.

While Wingood's interventions leverage interpersonal relationships to overcome shame and stigma, Mark Hatzenbuehler, PhD, has taken a structural approach, studying how societal-level stigma precipitates disparities. By comparing the health of people who are sexual minorities living in places that protect their civil rights with that of LGBTQ people living in places that condone discrimination, the associate professor of Sociomedical Sciences has built a body of evidence documenting the power of civil rights protections to promote health. "Concrete events and experiences like hate crimes or bullying or being the target of stereotypes certainly affect people's health," he says, "but that's





really just the tip of the iceberg, which is the broader social context in which stigmatized individuals live and work.”

In November 2016, Hatzenbuehler and his colleagues reported that in the wake of legislation to recognize same-sex and other civil unions in Illinois, sexual-minority women—particularly those who are people of color or have completed fewer years of formal education—reported reduced levels of stress, depression, and heavy drinking. The paper, in *Social Science & Medicine*, was the latest in a series of studies by Hatzenbuehler and collaborators spanning more than a decade. They’ve found that sexual minorities who live in places where societal-level conditions, cultural norms, and institutional policies constrain their opportunities, resources, and well-being are more likely to experience mood and anxiety disorders, tobacco and alcohol addiction, premature mortality, and chronic stress than sexual minorities of similar age, race, and educational attainment who reside in places with low levels of structural stigma. “Our work has shown that structural forms of stigma affect the lives of LGBT people across a wide range of outcomes,” says Hatzenbuehler. “The research is clear: State laws and social norms that promote stigma and discrimination against sexual and gender minorities harm the health of these populations.”

More recently, Hatzenbuehler has begun extending his analysis of structural discrimination to focus on the lives of people of color and immigrants. In February, *Social Science & Medicine* published his inquiry with colleagues into the effect of state-level policies—on immigration, race and ethnicity, language, and protections for agricultural workers—on mental health among people of Latin-American descent (Latinx), who report more depressive symptoms than whites.

Not surprisingly, the team found that Latinx living in states with a greater number of exclusionary policies experienced higher rates of poor mental health days than those living in states with more-supportive policies. They also found that, while the effect was most intense for Latinx,

all residents of states with exclusionary policies had a higher risk of poor mental health. “The consequences of structural stigma don’t just affect mental health or physical health,” says Hatzenbuehler. “Studies have shown that structural stigma also affects important determinants of health like employment and financial independence.”

Both Wingood’s and Hatzenbuehler’s findings dovetail with a prevailing theory known as the “social stress model.” According to the theory, the intense stress associated with oppression and social disadvantage accounts for the disproportionate rates of noncommunicable diseases (mood disorders, substance use, diabetes, heart disease, and the like) among marginalized groups.

Consider, for example, the “immigrant health paradox.” Newly arrived immigrants frequently exhibit *better* health than their American neighbors. Over time and across generations, however, their health appears to deteriorate—they gain weight, develop heart disease and diabetes, suffer from depression. It’s easy to blame such American staples as fast food and TV, but social epidemiologist Lisa Bates, ScD, suggests that the social stress model may offer a more likely explanation. “As immigrants get farther away from their support systems and bear the weight of stigmatization and structural racism and bias,” she says, “chronic stress and negative health consequences may develop.”

Higher rates of mood disorders among women than men also fit the model. In January 2016, *Social Science & Medicine* published analyses by Bates, assistant professor of Epidemiology and of Population and Family Health—with Katherine Keyes, MPH ’06, PhD ’10, associate professor of Epidemiology; doctoral student Jonathan Platt, MPH ’13; and Seth Prins, MPH ’10, PhD ’16—that show a direct correspondence between structural gender discrimination in the workforce, the gender pay gap, and mood disorders among women.

But sometimes the data don’t fit the model, says Bates, and knowing why is vital to developing meaningful theories

of disease causation and appropriate evidence-based programs to promote well-being. According to the social stress model, for example, the pervasive experience of racism and white supremacy should trigger far higher rates of depression among blacks than among whites. And yet epidemiological survey data suggest the opposite.

Over the last decade, Bates, Keyes, and David Barnes, PhD ’15, have conducted a series of analyses—reported in *Social Science and Medicine*, the *American Journal of Epidemiology*, and *Social Psychiatry and Psychiatric Epidemiology*—seeking an explanation for the paradox. In May, Barnes and Bates reported evidence in *Social Psychiatry and Psychiatric Epidemiology* that they’ve found a second paradox. While rates of major depressive disorder are lower among blacks, their rates of psychological distress are much higher than those among whites. “These and other findings suggest that our standard approaches to measuring depression may not adequately capture the mental health status of blacks in the U.S.,” says Bates, “and lead to insufficient recognition of their mental health needs.”

Sociomedical Sciences PhD student Tracy Pugh, MHS, grapples with the public health implications of the concept of “intersectionality,” a term coined in 1991 by Columbia and UCLA law professor Kimberlé Williams Crenshaw, JD, to describe how overlapping identities affect a person’s movement through the world. Decades of research have demonstrated that race, gender, sexual orientation, disability, and many other factors affect individual health across the lifespan. The farther a body strays from the white, male, heterosexual, able-bodied standard, the more likely that person is to experience stigma, have less access to resources, and face multiple forms of violence.

Understanding how that plays out promises to help public health practitioners address the unique needs of specific populations. For example, in a series of in-depth interviews with people of Puerto Rican descent, Pugh and colleagues plumbed the intersection of criminal justice involvement, substance use, and HIV status. *Drug and*



*Alcohol Dependence* published their analysis of the effect of substance use on adherence to HIV treatment. While study participants—Puerto Ricans with HIV being held at Rikers Island, the main jail for New York City—reported few experiences of race-based prejudice, most reported that both substance use and treatment had influenced their HIV treatment, suggesting new opportunities to tailor and refine standards of care to address their needs.

In her dissertation, Pugh is reanalyzing data from randomized controlled studies on HIV across 12 cities and 11 states, assessing how HIV outcomes relate to multiple identities. “Oftentimes in the public health sector, we fail to look at structural factors and interventions,” says Pugh. “We develop programs on a small scale and focus in on behavioral change.” It’s time, she says, for public health scholars to think big.

“We have to challenge the ways that our systems of governance perpetuate harm against racial minorities and others with stigmatized identities. Historic discrimination—like racism—is embedded in these systems, and we lose the high ground if we don’t call it out and take responsibility for it while developing meaningful solutions that improve health outcomes for all people.” 🏰

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Arkansas native **JASMINE BANKS** is a national digital campaigner with NARAL Pro-Choice America, director of marketing for Safety Pin Box, and a licensed counselor.

# Bringing It All Home

by Meril Cullinan

Assistant Professor of Sociomedical Sciences Diana Hernández, PhD, grew up in a Section 8 apartment in the South Bronx, where she watched her mother marshal the resources to become a homeowner. The experience illustrated what she would later learn in school: that housing can be a route to opportunity. “Housing can be a launching pad, a chance to live well on a daily basis and in the longterm,” says Hernández, who returned to the neighborhood as an adult. “I grew up in a disadvantaged community that still, 30-odd years later, faces many of the same issues of concentrated poverty, health disparities, and environmental burdens. All of the facets of my work are aligned as a public health researcher, a sociologist, and a neighbor; they are motivated by the fact that this neighborhood sits on my heart.”

Her gaze thus firmly fixed on the South Bronx, Hernández has devoted her scholarship to unraveling the mechanisms by which inequities in housing affect public health and devising ways that policymakers can ameliorate the damage. Take, for example, the experiences that she’s documented of anxiety and depression triggered by an outsize utility bill among people subsisting at or near the federal poverty level. Other projects have investigated the effect of energy-efficiency upgrades on the health of people who live in improved housing and explored the survival strategies used by low-income families coping with inadequate housing situations.

Her current work explores the last bastion for secondhand smoke. In New York City, smoking is regulated in most places: bars and restaurants, public spaces like parks and beaches, even Times Square. While there is no citywide ban on smoking in apartment buildings or homes, most newer buildings have banned tobacco. In her study, Hernández is looking at compliance and enforcement of smoke-free policies in ten affordable-housing developments with more than 900 residential units. “In affordable-housing settings, implementing smoke-free policies is a balancing act,” she says. “We want to reduce smoking to create better health outcomes, but we don’t want these policies to threaten the residents’ sense of housing stability. How do we reduce harm, garner resident buy-in, and make sure the rules are enforced in a humane way? These are the questions we’re looking to answer.”



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# Scientists Leverage Big Data for

## Precision Public Health

by Nancy Averett

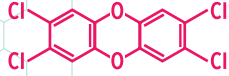
One Friday afternoon, Andrea Baccarelli, MD, PhD, and his research team got to talking about what types of publicly available data could explain the geographic disparities in extreme aging documented by the World Health Organization and others.

It was 4 p.m. when they commenced digging around online. They started by sifting through Census Bureau reports, looking for communities where disproportionate numbers of people live long enough to celebrate their 85th birthday, the benchmark for extreme aging. Then they pulled up other data—NASA satellite maps showing global air pollution, U.S. Centers for Disease Control and Prevention analyses of obesity prevalence, and Institute for Health Metrics and Evaluation reports on cigarette smoking. By Monday at noon, they had the framework for a report printed by *Environmental Health Perspectives* in November 2016. County by county, they found that local pollution levels were more predictive of longevity than smoking, obesity, or socio-demographic features like race or income.

Americans spend more of our gross domestic product on health than any nation in the world. Yet we suffer shorter lifespans and poorer quality of life. In its Healthy People 2020 guide to reversing those trends, CDC details 1,271 objectives spanning 42 topic areas. Setting community-level public health policy in response is like trying to take a sip from a firehose. Investigators must build the evidence base to help individuals and communities narrow their focus, says Baccarelli, chair and the Leon Hess Professor of Environmental Health Sciences. “We can create tools,” he says, “to help communities decide on top priorities and calculate the top interventions.”

That, in a nutshell, is the definition of precision public health—providing the right intervention to the right population at the right time. Focusing on the relevant data can save governments money and redirect scarce public dollars to where they’re needed most. Public health scholars have a surfeit of raw material with which to work, and Mailman School investigators are on it, devising a wealth of strategies to achieve the promise of precision prevention.

Pollution levels were more predictive of longevity than smoking, obesity, or demographic features.



## The Epigeneticist

**Andrea Baccarelli, MD, PhD,**  
chair and Leon Hess Professor of  
Environmental Health Sciences  
and director of the Laboratory of  
Environmental Precision Medicine

Scientists have long known that air pollution and other chemical exposures wreak havoc on the human body. Trained as a clinical endocrinologist, Baccarelli—who heads the Mailman School’s Laboratory of Environmental Precision Biosciences—has dedicated his career to understanding how. His early research sought clues to the process by which chemicals interact with genes to disrupt the endocrine system. Over the last decade, Baccarelli’s focus has narrowed in on epigenetics—the biochemical pathways that translate genetic codes.

Baccarelli was among the first to show that pollutants alter epigenetic translation through a process called DNA methylation, in which a molecule known as a methyl group attaches itself to DNA, silencing some genes and activating others. Since 2010, he has published more than 170 papers, many of which have been highly cited, exploring all manner of environmental exposures: air pollution, metals, bisphenol A and other chemicals, and psychosocial stress.

His work has also laid the groundwork for public health policy. Baccarelli’s 2008 report showing that prenatal dioxin exposure affects thyroid function in children was one of two analyses considered by the Environmental Protection Agency when it lowered the legal limit for dioxin emissions in the U.S. More recently, his documentation of the health effects of pollution in Beijing has informed the Chinese government’s increasingly strict clean-air regulations.

While the epigenome is often considered most vulnerable during the prenatal period, pollutants inflict damage at any age. In a study of air pollution exposure in older men, Baccarelli was among the first to show that our epigenome changes as we age. “There is evidence,” he says, “that older individuals are much more vulnerable to air pollution.”

Meanwhile, Baccarelli is exploring avenues for prevention and treatment. A pair of papers published this spring in *PNAS* and *Science Reports* details a clinical trial testing whether vitamin B supplements can reverse epigenetic damage caused by air pollution. Baccarelli and his coauthors found that the vitamins nearly erased the cardiovascular and immune damage caused by fine-particle air pollution. “Our study launches a line of research for developing preventive interventions to minimize the adverse effects of air pollution,” he says. “Because of the central role of epigenetic modifications in mediating environmental effects, our findings could very possibly be extended to other toxicants and environmental diseases.”

The study launches a line of research for developing interventions to minimize the adverse effects of air pollution.

## The Virus Hunters

W. Ian Lipkin, MD, director of the Mailman School's Center for Infection and Immunity (CII) and the John Snow Professor of Epidemiology, builds new tools to make disease detection faster and simpler in a bid to better contain epidemics.

This summer, the Federal Drug Administration issued an emergency use authorization for a test developed by a team led by CII associate research scientist Nischay Mishra, PhD, that can simultaneously detect the presence of Zika virus and all serotypes of dengue virus, chikungunya virus, and West Nile virus in up to 88 samples of blood in less than two hours. The test can also be used to detect Zika in urine. Known as the ArboViroPlex test, for the four types of arbovirus it detects, the assay builds on nearly two decades of research by Lipkin and his colleagues to speed the diagnosis of pathogens early in an outbreak, when it's easiest to curb.

In 2003, Lipkin played a pivotal role in curbing the SARS virus by creating a test—using a technique called polymerase chain reaction—that amplifies viral DNA for detection even in blood samples with minimal infection. Because his test could also detect the product of this amplification as it was happening, it could churn out diagnoses far more quickly than other methods.

In the intervening years, Lipkin has improved upon the technology he developed to detect SARS to create a test that can screen a single sample for the presence of hundreds of viruses that affect humans and animals. Known as VirCapSeq-vert, the tool contains 2 million genetic probes that detect the signature DNA of all known vertebrate viruses. Each probe binds to a corresponding viral sequence; when a particular virus is present in a sample, a magnetic process “pulls out” its unique sequences, which can then be used to identify the virus.

The platform could revolutionize how first responders react to deadly outbreaks like Ebola, dengue fever, or even the flu by accelerating diagnosis, thus informing quarantine deliberations and speeding tailored medical treatments. The tools promise to save both lives and money. More recently, the CII team has extended its work to methods for detecting bacterial and fungal DNA. “If you add the three together, you can capture the entire universe of infections,” Lipkin says. “So it's really quite powerful.”

The platform could revolutionize how first responders react to deadly outbreaks like Ebola, dengue fever, or even the flu by accelerating diagnosis.

**W. Ian Lipkin, MD**  
director of the Mailman School's Center for Infection and Immunity (CII) and the John Snow Professor of Epidemiology





## The Statisticians

Power is exactly what investigators seek when they sift through big data. The more data points researchers can consider, the more likely they are to find patterns, trends, and associations that may elucidate disease mechanisms. And new technology can capture all kinds of information—medical histories, geographic locations, biometric data, lifestyle habits—that can then be combined with millions of other bytes of information. It's no easy task, though, to figure out how to meaningfully analyze such gargantuan data sets. Biostatisticians approach the problem by turning the data inside out and upside down. They make tables, plot graphs, account for outliers and missing data points, and write and rewrite algorithms to sort the array of information that streams from smartphones and brain scans.

F. DuBois Bowman, PhD, the Cynthia and Robert Citrone-Roslyn and Leslie Goldstein Professor and chair of Biostatistics, creates, refines, and employs such quantitative tools to discover disease biomarkers in huge data sets. His current research focuses on making sense of the millions of measurements of brain activity that can be collected through such high-tech imaging technologies as functional magnetic resonance imaging (fMRI), diffusion tensor imaging, and positron emission tomography.

His analysis of brain scans of people with and without Parkinson's disease, for instance, experimented with methods to cull relevant insights from thousands of data points for each research participant. Bowman had just 42 participants, but their fMRI records—continual imaging that reveals the moment-to-moment changes in neural activity that occur even when a person is resting—generated 46,580 measures for him to assess. So he designed an algorithm to detect correlations—first among brain regions, then among subregions, and finally among voxels (the fundamental, three-dimensional units within an fMRI image, which each contain just a million or so brain cells).

In a 2016 study published in *Frontiers in Neuroscience*, Bowman and his coauthors detailed the 24 structural and functional differences between the healthy participants and those with early stage Parkinson's. Talk about a needle in a haystack: Those 24 relevant structural and functional differences represented just 0.051 percent of the original data.

"I like to say the brain boggles the mind," Bowman says. "It's very complicated. With our analytic methods, we try to characterize properties that are associated with brain function, but it is a daunting problem. Research in how to do this well continues to grow and evolve."

They detailed the 24 structural and functional differences between healthy participants and those with Parkinson's.

**F. DuBois Bowman, MD**  
Cynthia and Robert Citrone-Roslyn  
and Leslie Goldstein Professor  
in Biostatistics and chair of the  
Department of Biostatistics



**Ken Cheung, PhD**  
Professor of Biostatistics



And so, too, does the volume of information available. With the worldwide explosion of mobile technology such as smartphones, researchers can now tap into a continuous data stream about all kinds of human behaviors—our movements around town, our shopping habits, even the influence of our social networks on our mood and health behaviors.

That continuously growing store of data demands new methods of real-time analysis and optimization, the focus of work by Professor of Biostatistics Ken Cheung, PhD. An expert in artificial intelligence and machine learning, Cheung has devised analytical methods to test and enhance the personal relevance of IntelliCare, a suite of smartphone apps designed to promote mental health.

Each app is based on a clinically proven intervention for anxiety and depression. Using artificial intelligence algorithms, the software learns from how users interact with a given app, then recommends other apps within the suite that users might also find helpful. Cheung aims to enhance the software's responsiveness by analyzing thousands of seconds of user-interaction data and rewriting the underlying code to leverage the accumulated knowledge of an entire population of users to personalize care.

Those personalized recommendations are designed to maximize user engagement, says Cheung, because increased user engagement with the effective mental health practices IntelliCare supports has been shown to correlate with improvements among people who suffer from anxiety and depression. Cheung has already written a preliminary algorithm. Compared with the original software's results, his version boosted the number of meaningful user interactions by ten sessions per week. "Eventually," he says, "the goal is to have the recommendations informed by user data in such a way that they update in real time. So the recommendations will get better and better."

The benefit of Cheung's work isn't limited to IntelliCare and its suite of apps, says the professor. The research and algorithms he and his team have developed can also be applied more broadly, creating new opportunities to mine big data for precise, effective interventions to inform and improve individual lives.

The software learns from how users interact with an app, then recommends additional tools that a particular individual might also find helpful.





## The Policy Analyst

In 1994, the state of Florida launched an experiment to overhaul welfare. The five-year randomized trial put time limits on recipients' eligibility for benefits and offered job training and other employment-related support. Two decades later, on a quest to document the long-term health effects of that reform, Peter Muennig, MD, MPH '98, professor of Health Policy and Management, compared the state's data on the people involved in the experiment with its 2011 Social Security rolls. What he and his colleagues found was alarming: In a 2013 paper published in *Health Affairs*, they reported that hundreds of former welfare recipients had died prematurely.

The investigators uncovered the deadly side effect by zeroing in on the post-welfare circumstances of women who were unable to join the workforce due to disability or family-care responsibilities. Compared with those who found paid work when their benefits ran out, the women who couldn't work were at greater risk of homelessness and more likely to die sooner. "Failing to target programs to specific groups can be harmful," says Muennig. "In the case of welfare reform, the 'average' person benefited, but some people died because the program didn't consider that anyone would be harmed. That's bad policy."

For more than two decades, Muennig—who is also a member of GRAPH, the Mailman School's Global Research Analytics for Population Health program—has sifted through the aftermath of policy change to uncover the nuances lawmakers might miss, quantifying both return on investment and such unintended consequences as the premature deaths of the women in Florida.

In ongoing work, he continues to explore the health outcomes of state-level welfare reforms. He's also investigating whether government-funded prekindergarten programs designed to boost cognitive development among low-income children also improve their health. The latter draws upon decades of follow-up data on kids who attended programs for particularly impoverished families in the 1960s and 1970s. Muennig found that as adults they had more-stable family environments, better health insurance coverage, higher earnings, and healthier behaviors.

So when is pre-K a smart public health investment? Muennig is currently analyzing additional data collected by the U.S. Department of Health and Human Services. "It looks like if you target these programs to the kids who are really disadvantaged, you get these big benefits," he says. "But if you don't, you don't."

Some people benefited, but some people died. That's bad policy.

**Peter Muennig, MD, MPH '98**  
professor of Health Policy and Management





## The Epidemiologists

Ezra Susser, MD, MPH '82, DrPH '92  
professor of Epidemiology and of  
Psychiatry



In 1975, famed Columbia epidemiologists Mervyn Susser and Zena Stein led a study of IQ among survivors of the Dutch Hunger Winter, a six-month famine that began in September 1944 when Nazi troops blocked food supplies to the Netherlands' western provinces. Women who became pregnant during that brutal winter subsisted on as little as 500 calories per day. While Susser and Stein found no intelligence deficits among the tens of thousands of adults who were either conceived or in the early stages of fetal development during the Hunger Winter, they did find a higher rate of neural tube defects such as spina bifida and microcephaly.

More than four decades later, their son—Ezra Susser, MD, MPH '82, DrPH '92, professor of Epidemiology and of Psychiatry—has found epigenetic clues from the same cohort that suggest concrete maternal health interventions to promote improved psychiatric health among the next generation. The work began with a study of psychiatric hospitalization records, which revealed an increased risk of schizophrenia among adults conceived just before or during the famine. Subsequent studies pointed to a role for the IGF2 gene, whose expression is modified within the cohort.

More recently, analyses of the Autism Birth Cohort (ABC) Study—a trove of data compiled from thousands of Norwegian children with autism and their mothers—homed in on folate's role in the prenatal pathways of cognitive development. A micronutrient found in dark green leafy vegetables, folate protects against neural tube defects during the first trimester—precisely the diagnoses the elder Susser and Stein found in their Dutch Hunger Winter analyses. In the Norwegian study, children of women who had insufficient pre- and early-pregnancy folate levels had a greater chance of being diagnosed with autism. Ezra Susser wants to know whether a mother's folate levels might also be related to her children's chances of developing schizophrenia. The answer won't come quickly. The ABC babies are still decades away from developing symptoms, which rarely manifest in childhood.

Meanwhile, Susser and his colleagues are examining the DNA in cord blood samples collected from some of the ABC children, looking for epigenetic tags similar to those seen in the Hunger Winter cohort. "It will take some time to figure this all out," says Susser. "I hope not my whole lifetime." 🍷

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**NANCY AVERETT** writes about science and the environment from Cincinnati. Her work has been published in Pacific Standard, Audubon, Discover, and others.

Low folate levels early in pregnancy seem to raise the risk for autism. Current work tests its role in schizophrenia.

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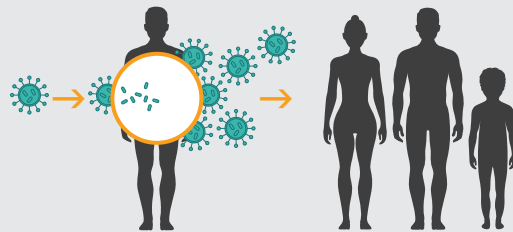
# ON THE HORIZON

**Climate Scientists Forecast the Flu**

by Tim Paul

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The flu is a highly contagious respiratory virus that spreads from person to person.



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For most of us, the flu is a minor inconvenience. A box of Kleenex, a day or two of missed work, and that's it. But not everyone is so lucky. A bad case of the flu can send a person to the hospital, or even to the grave.

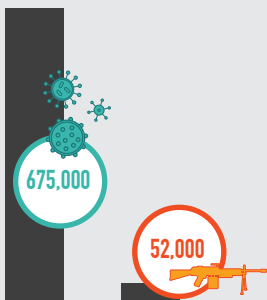
The number of American fatalities associated with influenza—a highly contagious respiratory virus—varies wildly from year to year: in the winter of 2011–2012, 12,000 people died; the next year, nearly 50,000. During the 1918–1919 Spanish flu pandemic, more than a quarter of the country caught the bug, and 675,000 died. The virus claimed more American lives than World War I and, by

some estimates, 50 million people around the world were felled by that one pandemic.

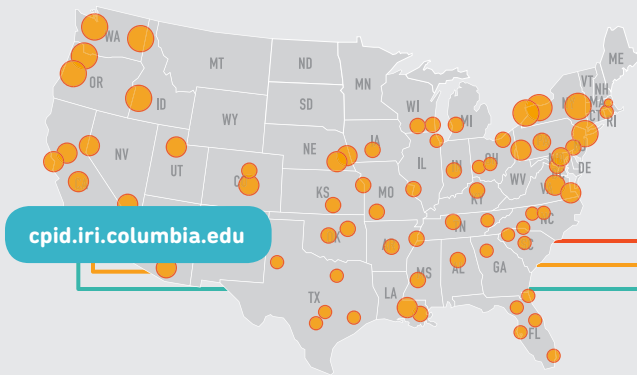
Predicting the magnitude and timing of outbreaks has long been a guessing game, because the information we've had about influenza has been old and incomplete. Like the visible tip of an iceberg, the data on documented cases fails to account for the underlying dynamics of how the virus spreads. But in recent years, scientists have developed methods drawn from computer modeling and weather forecasting to provide a more complete picture of these invisible forces.

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Among Americans, there were more casualties of Spanish flu than WWI.







Every year since 2013, Jeffrey Shaman, PhD, associate professor of Environmental Health Sciences and director of Columbia’s Climate and Health Program, has published weekly forecasts of the flu season. Specific to 108 cities across the country, the [online projections](#) predict whether cases are expected to rise or fall and by how much. A new version of the system drills down to the neighborhood level, using data on commuter patterns. In New York City, where it was tested, the system might, for example, tell residents in the South Bronx that they are more at risk than someone living in Soho.

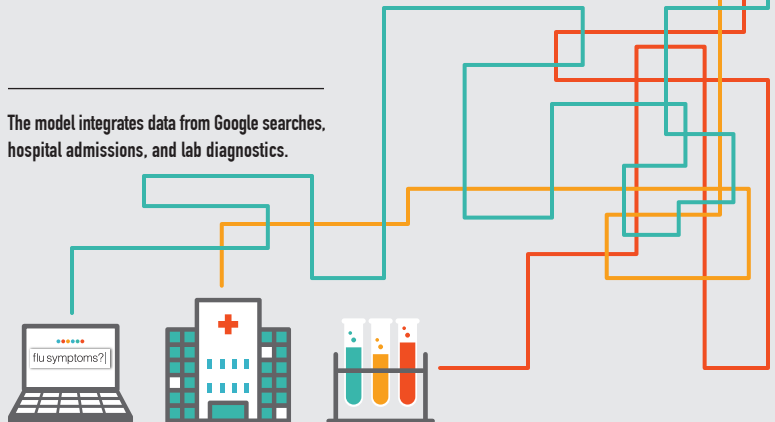
In temperate climates like North America’s, the flu arrives every year sometime between October and May. What drives this seasonal pattern has been the subject of scientific debate. Some have argued that reduced sunlight exposure during the cooler months suppresses our immune systems; others, that more time spent indoors increases our exposure to infected people. In the fall of 2007, Shaman, a Columbia University-trained climate scientist with a special interest in hydrology, had a hunch about humidity. Reanalyzing data from an experiment involving guinea pigs, he found that drier air increased the likelihood that the lab animals would catch the flu. Using that insight, he created a computer model that was able to reproduce the average rise and fall of three decades of human cases.

While Shaman’s humidity model could predict the average timing of many flu seasons, it wasn’t powerful enough to draw conclusions on any single season. In December 2008, Shaman and his former PhD classmate Alicia Karspeck discussed the problem over lunch. Karspeck, now a scientist at the National Center for Atmospheric Research, suggested that they adapt the mathematical methods used in meteorological forecasting, which simulate the weather based on thousands of observations—from weather satellites, ocean buoys, and the like—and extrapolate into the future.

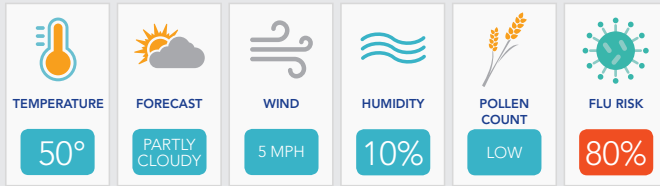
Using a similar approach, Shaman and Karspeck built a computer model to simulate how influenza spreads through a population, drawing on hospital admissions reports and data provided by Google on cold- and flu-related search queries. Their model generates hundreds of estimates, creating visual “spaghetti,” with some trajectories indicating a sharp rise in sickness and others a gradual uptick or downward trend. Then the algorithm applies a technique from weather forecasting called data assimilation to weave those strands of spaghetti into a single prediction.

To test their model, the pair made what’s known as a retrospective forecast, using historical data and comparing their model’s prediction to actual disease patterns. Their test run, on five flu seasons in New York City—published in 2012 in *Proceedings of the National Academy of Sciences*—showed that their computer model

The model integrates data from Google searches, hospital admissions, and lab diagnostics.



Flu forecasts could help citizens anticipate their risk of infection, even spur vaccination rates.



could predict the peak of the outbreak more than seven weeks in advance. “The model mimics the behavior of the outbreak as it has thus far transpired,” says Shaman. “Doing so gives you a better chance of predicting where it will go in the future.”

Soon Shaman was generating his predictions in real time. When he first showed his work to officials at the U.S. Centers for Disease Control and Prevention back in 2012, he was met with skepticism. Undeterred, he sent them unsolicited weekly forecasts. Then in 2013, CDC officials invited Shaman’s group and five other teams to forecast the current flu season. The Mailman School team routed the competition. Their triumph owed to the use of the same kind of confidence probabilities people have come to expect from weather forecasts—if there’s an 80 percent chance of rain, we’ll take an umbrella. Similarly, influenza forecasts have the potential to provide actionable information to both health officials and the public.

One administrator at a large medical center told Shaman that knowing the chances of a surge in symptoms would help hospitals avoid being caught off guard, short on supplies like gloves and masks or with too few clinical staff on hand. Greater awareness could help the public, too, says Shaman, by motivating people to take steps to avoid getting sick in the first place. He foresees a day when his forecasts become a regular part of local weather reports, alongside pollution levels and pollen counts. “Flu forecasts,” he

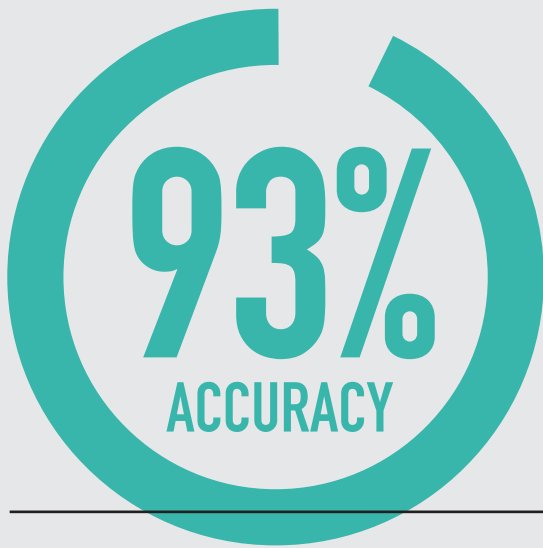
says, “can help people stay informed and consider whether they’re up to date on their shots and whether they might need to keep their kids home from school if they’re beginning to get sick.”

Shaman and his collaborators are still refining their approach. To boost the model’s accuracy, they’ve started combining data on hospital admissions for flu-like symptoms with cases of influenza verified by a lab, helping them to distinguish respiratory viral strains from the common cold. More recently, Shaman’s team—including Wan Yang, PhD, associate research scientist in Environmental Health Sciences, and epidemiologists at New York City’s Department of Health and Mental Hygiene—reported success in generating forecasts for specific neighborhoods. The results, published in *PLOS Computational Biology* in 2016, showed that their algorithms could provide nearly the same local specificity as weather forecasts—something important, notes first author Yang, because “most public health decisions are made on the local level.”

Meanwhile, the researchers tested their forecasts in Hong Kong, where semitropical conditions allow influenza rates to ebb and flow throughout the year. In partnership with researchers at Hong Kong University, Shaman and Yang tweaked their computer model to generate three-week forecasts with up to 93 percent accuracy. The team is now setting up a system for real-time predictions to guide public health decisions for the city—and potentially

Flu forecasts can help people stay informed and prepared.





beyond. “Having a foothold there and being able to make predictions in that area of the world is going to be very valuable on the global stage,” says Shaman, who notes that new flu strains, particularly pandemic varieties, often emerge from Southeast Asia.

In recent years, Shaman and Yang have extended their approach to other pandemic threats. In the summer of 2014, Shaman got an urgent call from the CDC. The official, familiar with his flu forecasts, wanted to know if the professor could help him get a handle on the rapidly worsening Ebola outbreak in West Africa. Despite a lack of research into the disease dynamics, the strength of the outbreak “signal” allowed Shaman and Yang to generate forecasts. These and other predictions, along with traditional surveillance on the number of patients being treated, helped officials understand the urgency of the situation and commit resources to fight the epidemic. “In a situation like the Ebola outbreak where there is little data available,” says Shaman, “forecasts provide information to guide decisions so officials aren’t completely flying blind.”

Near the end of the outbreak, Shaman’s team obtained district-level data in Sierra Leone. With the additional information, they were able to recreate the internal dynamics of the outbreak and identify critical junction points in the districts of Kenema and Port Loko. In a retrospective analysis published in 2015 in the *Journal of the Royal Society Interface*, Yang and Shaman showed that had the

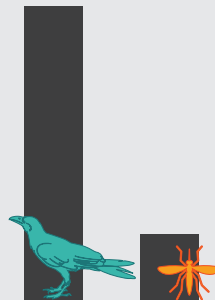
forecast been done in real time, officials might have interrupted the epidemic’s spread by focusing interventions on those two districts.

No matter the finer points, generating accurate forecasts requires a thorough understanding about how contagions spread—the underwater part of the infectious-disease iceberg. In ongoing work, Shaman’s team is developing increasingly complex models that account for hundreds of subpopulations, and stitching together multiple models into “superensembles,” evocative of the approach meteorologists use to anticipate the path of a hurricane. Other models incorporate the life-cycle dynamics of the insects and animals that spread disease, such as the 70 mosquito and 300 bird species that carry West Nile virus. Ongoing work with colleagues at China’s Academy of Military Medical Sciences focuses on H7N9, an emerging and deadly strain of avian influenza that kills approximately one-third of those infected. Currently, the illness spreads exclusively from birds to humans and not among infected people. But health officials worry that if the virus mutates so that it can spread person-to-person, the consequences could be catastrophic—in Shaman’s estimation, “Ebola on steroids.”

Ultimately, computer simulations still rely on observational data. Over the years, investments in more-sophisticated weather satellites have bolstered public confidence in weather forecasts,

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Some 70 mosquito species and 300 bird species spread West Nile Virus.





# Hot Topic

Global climate change poses an unprecedented threat to human health via heat stroke, shifting patterns of infectious diseases, and waterborne illnesses from flooding and toxic-algae growth, as well as injuries and mental stress from climate-related natural disasters. Worldwide, the need for professionals trained to anticipate and mitigate the health impacts of the climate crisis has never been greater.

The Mailman School—which in 2009 was the first school of public health to create an academic program in climate and health and now offers dedicated master’s- and doctoral-level programs on the subject—is working to give other schools a leg up.

Launched earlier this year and led by Environmental Health Sciences faculty Jeffrey Shaman, PhD, and Kim Knowlton, DrPH ’05, the Global Consortium on Climate and Health Education (GCCHE) aims to support institutions as they add climate and health to their curricula. The Rockefeller Foundation–funded effort—which now comprises 126 health professions schools representing 11 countries and more than 80,000 students—grew out of a meeting for government officials, educators, researchers, and funders, hosted by the Mailman School at the 2015 COP 21 climate summit in Paris. Since the U.S. withdrawal from the Paris Agreement, academics and others have stepped up to take leadership on every aspect of understanding, preparing for, and responding to climate change.

To help schools developing or expanding programs for aspiring medical and public health professionals, GCCHE staff are building an **online clearinghouse** populated with training materials, syllabuses, and eventually, online courses. Projects on the GCCHE drawing board include content for students in other disciplines and at various points in their training, as well as policy-makers and business leaders.

“A lot of what we do is help people see how climate change is affecting us in our backyards right now,” says Knowlton. As parts of the world become too hot for people to productively work outside or uninhabitable due to flooding, economic and political stability is threatened. But the message isn’t all doom and gloom, she says. “We want everyone to see the opportunities to improve health and their bottom line.”

[mailman.columbia.edu/gcche](http://mailman.columbia.edu/gcche)

## Your Complete Disease Forecast



says Shaman. Likewise, he suggests, health officials should do more to seek out information on illnesses, particularly as the cost of identifying pathogens drops. In the meantime, the scientist is undertaking an \$11 million study funded by the Defense Advanced Research Projects Agency to understand the transmission dynamics of respiratory illnesses in New York City. Shaman’s research team is collecting nasal swabs at local high schools, day care facilities, and a pediatric emergency department to understand, among other things, how many people are infected with mild illnesses and what role these semihealthy people play in the spread of disease. The U.S. Department of Defense is funding the study, in part, says Shaman, because “in the history of the U.S. military, more people have died from infectious disease than in combat.”

This kind of proactive approach to data collection is central to efforts to anticipate infectious outbreaks, with implications from AIDS to Zika, as well as more obviously weather-dependent conditions like diarrheal disease and famine. In theory, even social contagions like obesity and opioid addiction could also be forecast. “There is a lot of room to grow,” says Shaman. “We’re only just getting started.”

**TIM PAUL** edits the Mailman School’s Transmission newsletter. His report on immigration and refugee health appeared in the 2016 edition of this magazine.



Epidemiologist Wafaa El-Sadr (right, in blue wrap) seeks methods to boost the translation of research into practice, including tactics to increase participation in long-term HIV treatment at high-quality clinics—like the one in Swaziland where this child and her mother wait for a relative.

# FROM RESEARCH TO ACTION

## GLOBAL PROJECTS PUT EVIDENCE TO WORK

by **Alison Fromme**

**T**he people of Swaziland—a small, landlocked nation in southern Africa—have among the worst life expectancy measures in the world, a result of the twin epidemics of HIV and tuberculosis. While much has been done to confront HIV among pregnant Swazi women, fully 41 percent have the retrovirus. And while high-quality HIV health services and evidence-based treatments are

widely accessible at primary healthcare facilities in Swaziland, it remains difficult for women and their families to remain in long-term treatment.

Such conundrums exist throughout the field of public health, says Wafaa El-Sadr, MD, MPH, professor of Epidemiology and founding director of ICAP, the Mailman School's global health center. "We have a lot of evidence about what works,"

she says, "but there is a gap between the research findings and the ultimate health outcomes we want to achieve."

El-Sadr is a leader among a cadre of scholars intent on identifying the most effective means for translating public health evidence into practice. Working around the globe with their in-country partners, such researchers are developing packages of interventions to support long-term care



Legal scholar Sara Abiola (left) investigates how legislation and policy can transform the human environment to promote or protect public health. A current project catalogs differences among WHO member nations in policies to regulate cigarette sales (right), reduce exposure to secondhand smoke, and increase awareness of the dangers of tobacco.

**Implementation science tests methods for improving the uptake, implementation, and translation of research findings into routine and common practice.**

for people with HIV; documenting, testing, and comparing the effectiveness of tactics to improve health outcomes; and creating programs designed for resource-constrained settings. In the process, they’re piloting and scaling up evidence-based approaches to public health promotion that can be tailored to reflect local customs, cultures, and resources.

Not to be confused with the implementation of programs, implementation science—an approach that El-Sadr has championed in the U.S. and abroad—tests methods for spurring the uptake, implementation, and translation of research findings into routine and common practice. In Swaziland, for example, ICAP is testing the best methods for linking people with HIV to ongoing care and helping them to stick with it. Among the approaches under inves-

tigation are additional testing to estimate the risk of complicating infections, accelerated initiation of HIV treatment, appointment reminders sent via mobile phones, provision of care and prevention items like condoms, and noncash financial incentives to cover the cost of travel to clinics.

**A LEGAL FRAMEWORK**

The challenge of bridging the gap between public health scholarship and health outcomes often boils down to a single question, says Sara Abiola, PhD, JD, assistant professor of Health Policy and Management: “How do you change the environment so that people can engage in healthy behav-

iors?” A Harvard-trained lawyer with a doctorate in health policy, Abiola investigates how legislative interventions can help prevent chronic, noncommunicable diseases—especially those related to food, alcohol, and tobacco—around the world.

The key to success, she says, is a coherent policy package that promotes synergy. Consider childhood-obesity prevention, she suggests. Physical education classes in grade schools have been shown to boost fitness. But if a state fails to also promote access to healthy foods in school cafeterias, its legislation regarding gym classes will have a limited impact on childhood obesity. To identify effective approaches to public health legislation worldwide, Abiola and her team are compiling a comparative database of legislation and policy from Brazil, India, Kenya, Mexico, South Africa, and the U.S. “Our





Emergency physician Rachel Moresky (right) travels frequently to Ghana, as well as Cambodia, Honduras, Kenya, and Rwanda. In each country, she partners with local healthcare providers and government agencies to develop acute care practices and protocols tailored to local needs, resources, and expertise.

goal,” she says, “is to optimize packages of evidence-based policies that positively influence public health outcomes.”

Using a quantitative scoring system developed in her own research group, Abiola and her team rate each country’s response to a number of public health challenges. The team’s tobacco index, for example, rates seven categories linked to the leading cause of preventable deaths worldwide—such considerations as how tobacco sales are administered and what consumer warnings are legally mandated. As the subject of a binding treatise from the World Health Organization, which requires member nations to take specific action to address smoking, tobacco has been the subject of an array of legislative efforts to boost awareness, restrict availability, and promote access to programs that can help citizens kick their addiction. But not all legislation is created equal, as Abiola and her team are documenting.

As a proxy for exposure to secondhand smoke, for example, the team has scored restrictions on indoor smoking. The researchers award a high score if a nation

prohibits smoking in many locations, and “partial credit” if smoking is only prohibited in a few venues. “We’re marrying legal data with epidemiological data to create an accurate measurement,” says Abiola. “The index itself incorporates evidence around policies that are expected to work.”

The team also weighs aspects of the cultural context in which those policies exist. In Moldova, for example, local and regional governments rely heavily on revenue generated by the wine industry. “That’s an important factor to consider when trying to regulate and reduce alcohol use,” says Abiola. “The conversation has to be nuanced.”

## **SYSTEMS THINKING**

A child with pneumonia struggles to breathe. Her nostrils flare, her lips develop a blue tinge. What happens next in this frightening emergency scenario depends

on the healthcare setting and the available resources. At a university hospital, a physician specialist might insert a tube into the child’s trachea and connect it to a mechanical ventilator; at a community clinic, a nurse might give the child antibiotics and refer her to a higher level of care.

In the absence of adequate treatment, pneumonia claims the lives of more than 2 million children under the age of 5 every year. Associate Professor of Emergency Medicine and of Population and Family Health Rachel Moresky, MD, MPH, had a theory that—in the absence of expensive high-tech equipment and specialists to operate it—a simpler, cheaper intervention, performed by trained nurses, could save lives. To prove her theory, Moresky and her colleagues in Ghana studied the training of nurses at first-level hospitals in rural parts of the country on how to use continuous positive airway pressure (CPAP) therapy to relieve respiratory distress in children under 5 years of age.

The research, developed in Ghana and scaled as a training program in Cambodia,




In Ghana, Moresky and her team developed a training program to increase the number of healthcare providers able to provide breathing support for children with pneumonia (left) and created systems to collect the data needed for local initiatives to achieve evidence-based improvements (right).

Honduras, Kenya, and Rwanda, is “task sharing with supportive supervision,” says Moresky. Many lifesaving interventions are reserved for highly trained specialists, she notes. But when such tasks are shared by healthcare workers in conjunction with supportive supervision, she says, more lives can be saved at facilities closer to a patient’s community.

The CPAP program is part of a much larger effort by Moresky, who founded and directs Systems Improvement at District Hospitals and Regional Training of Emergency Care (sidHARTE), a program for strengthening emergency systems. Since 2008, sidHARTE has partnered with universities, governments, and local stakeholders to provide high-quality, resource-appropriate acute care through technical assistance, implementation support and science, training, capacity building, and policy innovation. “To make improvements to healthcare systems,” she says, “stakeholders need to use evidence to determine exactly how to integrate acute care.”

In partnership with the governments of Ghana and Rwanda, sidHARTE has built an acute care toolkit with assessment, training, and clinical guidelines, as well as policy development notes; the Rwanda toolkit is available on the WHO website. In June, Moresky and the sidHARTE team returned to the Upper East Region of Ghana with representatives from the nation’s Health Service to develop ways for facilities and districts to collect data they can use to make their own evidence-based improvements. Strategic planning across agencies is key, she says. “The corresponding investments in infrastructure, human resources, and outcomes research for acute care systems are considerably underfunded,” she says, “and as a result, lives are needlessly lost that could be saved with rapid, resource-appropriate interventions that are better integrated with primary and chronic care systems.”

Whether analyzing legal frameworks, enhancing healthcare delivery, or identifying optimal methods for program

implementation and expansion, public health scholars must work within existing health systems. Like Moresky’s sidHARTE, which has long-standing collaborations with local partners, El-Sadr’s ICAP ensures full ownership of the programs and research by in-country stakeholders. Scientists must also identify meaningful data points that are easy to collect, says El-Sadr, and use rigorous analytical methods to assess how best to deliver evidence-based practices and scale them up effectively. “Public health includes a spectrum of research, programming, training, and implementation science, and every part is important,” she says. “We want to inspire and motivate the next generation of researchers and those who take knowledge to action.” 

Health and environment reporter **ALISON FROMME** contributed to The Science Writers’ Handbook.









# Political Perils

## Reproductive Health Risks—at Home and Abroad

By **Meril Cullinan**

Interviews by **Alla Katsnelson**

Photo by **Martin Seck**

Maternal health creates conditions for well-being that echo through the generations. Yet the U.S. government's foreign policy has alternately supported and impeded women's health since 1973. The latest chapter starts with the Helms amendment to the Foreign Assistance Act. Passed just months after the Supreme Court struck down domestic anti-abortion laws in *Roe v. Wade*, the Helms amendment outlaws—to this day—U.S. funding for abortions abroad.

President Ronald Reagan extended the amendment's reach in 1984 with his Mexico City Policy, also known as the Global Gag Rule. To receive family planning assistance from the U.S., recipient organizations must pledge to neither provide nor promote abortions as a method of family planning—even if they use non-U.S. funding. Easy for the White House to modify—without congressional approval—the policy has been rescinded by Democrats and reinstated by Republicans ever since.

As one of his first acts in office, President Donald Trump reinstated and dramatically expanded the rule. In its latest iteration, the policy applies to all U.S. healthcare assistance of any kind. The move affects fully \$8 billion in foreign aid disbursed by the State Department, U.S. Agency for International Development (USAID), and the Department of Defense—a radical expansion from the \$600 million previously affected.

The ongoing policy ping-pong has furnished a case study in unintended consequences. The World Health Organization analyzed abortion data across 20 countries, comparing rates during the Clinton and George W. Bush administrations. Their findings, published in 2011, are stark: Where the Mexico City Policy had the greatest impact, the number of abortions—both safe and unsafe—rose, while contraception use fell.

Other studies have shown that where abortion is illegal or highly restricted, the number of unsafe abortions rises, in turn exacerbating maternal and infant mortality rates. WHO estimates that currently there are 21.6 million unsafe abortions a year, which account for about 13 percent of global maternal mortality. The NGO Marie Stopes International, one of the biggest recipients of USAID family planning funds, projects an additional 2.1 million unsafe abortions due to the current version of the policy.

This year, representatives of advocacy organizations and 138 deans of schools of public health—including Mailman School Dean Linda P. Fried, MD, MPH—signed on to a coalition statement opposing the Mexico City Policy because it “seriously hinders the effectiveness of U.S. global health investments and the growing global progress that we, as a global community, have made in expanding access to family planning for couples worldwide and in reducing maternal mortality.”

We asked three Mailman School faculty members to discuss the current policy environment. Professor of Epidemiology and of Population and Family Health Carolyn Westhoff, MD, heads the Division of Family Planning and Preventive Services in the Department of Obstetrics and Gynecology of the College of Physicians & Surgeons. Terry McGovern, JD, chair and professor of Population and Family Health, has served as a senior program officer of both the Women’s Health and Human Rights Advocacy Project and the Gender, Rights, and Equality unit of the Ford Foundation. Lynn Freedman, JD, MPH ’90, professor of Population and Family Health, directs the Mailman School’s Averting Maternal Death and Disability (AMDD) Program.

*“These are big public health issues that affect who lives and who dies.”*

*“Everyone is focused on contingency planning, which takes away from the real work of providing care.”*

*“If citizens have a real voice ... you can improve services for anyone.”*

### **How does the current political climate affect existing challenges in family planning?**

**CW:** Every dollar spent on contraception saves multiple dollars in direct healthcare costs. What we’re doing has been proven to work extremely well, with excellent health outcomes. Yet people are looking for multiple ways to disrupt it.

### **What issues are you monitoring in the U.S.?**

**TM:** We’re obviously watching Congress and the Affordable Care Act (ACA). People may lose no-copay birth control. There is uncertainty around OB-GYN care, cancer screening, and pre-existing conditions. If the ACA is curtailed, we’ll see many more women uninsured, disparately impacting African-Americans and Latinas.

**CW:** The legislative and administrative changes in the works at the federal level are enormous, and so is the resulting uncertainty around how it will all play out. Clinics, many already struggling financially, have very concrete decisions to make around space, staff, supplies. But it’s impossible to do rational planning and budgeting; everyone is focused on contingency planning, which takes away from the real work of providing care. Providers are







# In the Cr

**BY SHARON TREGASKIS  
WITH REPORTING BY TIM PAUL  
AND RUBY OLISEMEKA**

Americans spend more time on the road than ever, and yet our risk of dying in a motor vehicle crash has plummeted over the last 100 years. Credit decades of meticulous research that has shaped everything from vehicle design to roadway engineering, as well as emergency protocols and laws on child passenger protections and drunk and distracted driving penalties.

By stark contrast, Americans run an ever-increasing risk of dying due to firearm violence. And unlike motor vehicle safety,

there's a dearth of evidence and scientific resources to guide prevention, says Charles Branas, PhD, chair of Epidemiology and co-author of a March editorial on the topic in the *American Journal of Public Health*. Scientists, he says, must tackle this nation's seemingly intractable gun violence problem.

Branas knows of what he speaks. A one-time paramedic who did a stint in the Philadelphia morgue in the early 1990s, when the city's murder rate was at its peak, Branas has seen firsthand the casualties of America's gun violence crisis. In the two decades since, he's built a body of research on the topic that has been cited by the Supreme Court, Congress, and the director

of the National Institutes of Health. Among his findings: nationwide, suicides are a more common cause of firearm deaths than homicides; possessing a gun may not be as protective as many people think; and the risk of being fatally shot is actually greater in small-town America, where gun suicides are more common, than in our cities, where gun homicides prevail.

A city dweller since birth, Branas founded the Urban Health Lab to produce new scientific evidence for the cost-effective design and implementation of health and safety programs in cities—on themes as diverse as buildings and housing, greening and land management, climate and resil-





## GUN VIOLENCE AND INJURY PREVENTION

# crosshairs

ience, and murals and art. In December, the *American Journal of Public Health* published the lab's analysis of low-cost blight-remediation projects to reduce firearm violence in poorer neighborhoods in Philadelphia.

Working in partnership with several U.S. cities, Branas and his colleagues at several universities have conducted multiple observational studies and randomized controlled trials to analyze gun violence before and after an array of interventions. In the process, they've raised millions of dollars, greened thousands of acres of vacant lots, fixed thousands of abandoned buildings, even built affordable housing.

Their simple, relatively inexpensive design fixes have reduced gun violence and shown a clear cost-benefit, without spurring gentrification. "When you clean, green, or rebuild a place, people who have often been asking for decades for someone to do something don't want it to go back to the way it was," he says. "They feel more connected to their surroundings and each other and will go out of their way to prevent negative things—from noise complaints to gun violence—from reoccurring in those spaces."

Urban, place-based interventions are just one facet of the work needed to turn the tide, says Branas, noting increasing

rates of gun suicides in impoverished rural areas. "Shootings are everyone's problem, big cities and small," he says. "A lot of scientists make a career out of elegantly associating social determinants of health with negative outcomes, but then never provide actual solutions. We can do better." [👉](#)

THROUGH HIS URBAN HEALTH LAB, CHARLES BRANAS, PHD, CHAIR OF EPIDEMIOLOGY, HAS INVESTIGATED HOW PLACE-BASED FACTORS—INCLUDING PUBLIC ART LIKE THIS KEITH HARING MURAL, "WE THE YOUTH," IN PHILADELPHIA'S POINT BREEZE NEIGHBORHOOD—CONTRIBUTE TO VIOLENCE REDUCTION. (AP PHOTO/MATT ROURKE)

## Heavy Metal

*The Chronic Disease Connection*



The ongoing debacle of lead in the water of residents in Flint, Michigan, has brought the hazards associated with acute heavy metal poisoning into sharp relief for the general public. Less well-known are the hazards linked to chronic low-level exposure to heavy metals. Physician-

epidemiologist Ana Navas-Acien, MD, MPH, PhD, studies how exposure to subtoxic levels of arsenic, cadmium, and lead contributes to chronic disease. Research by the newly appointed professor of Environmental Health Sciences (EHS) includes an inquiry into the heavy metals inhaled by e-cigarette users, the health effects of arsenic that leaches through groundwater into residential drinking wells, and the role of leaded gasoline in the nation's epidemic of high blood pressure and heart disease.

At the Mailman School, Navas-Acien has partnered with EHS Professor Regina Santella, PhD, on a clinical trial that explores chelation, a technique for reducing levels of lead within the human body, and whether it helps to halt the progression of cardiovascular disease. Ongoing work with Native American communities in South Dakota investigates interventions to mitigate the long-term health hazards of private wells contaminated with arsenic, which contributes to both heart disease and Type 2 diabetes. "In these and other rural communities in the U.S., arsenic occurs naturally in groundwater, and it's a major challenge," says Navas-Acien, who is collaborating with investigators in Columbia's Superfund Basic Research Program, led by EHS Professor Joseph Graziano, PhD. "There's no requirement to test well water, so families are left on their own, without any protection."

## SHIFT Work

*First Report From Sexual Health Initiative*

Researchers with the Sexual Health Initiative to Foster Transformation (SHIFT), a major research project to study sexual violence and sexual health among Columbia University undergrads, presented initial findings at an all-day symposium at the Mailman School in May 2017. Their presentation covered highlights of their investigation into unwanted, nonconsensual, and consensual sex, as well as opportunities to prevent sexual assault and promote sexual health. The findings, which draw from multiple data-collection methods, underline a multiplicity of undergraduate experiences, inclusive of women, men, and gender-nonconforming people. "We need to take seriously the diversity of our student body," says Jennifer Hirsch, PhD, co-director of SHIFT and professor of Sociomedical Sciences, "both the varying prior preparation they have had and their lived experiences."

## Where There's Smoke

*Tobacco Disparities, by the Numbers*

In New York City, a pack of cigarettes can cost \$15, compared with less than \$6 in parts of Pennsylvania. Flavored tobacco cannot be sold in New York City, but it can be purchased in New Jersey and Pennsylvania, and all three locations have slightly different smoke-free air laws. "Place matters," says Assistant Professor of Sociomedical Sciences Daniel Giovenco, PhD. "Where we live has a huge influence on our behaviors and health outcomes, especially when it comes to cigarette smoking. But we don't know enough about the promotion of other tobacco products, including reduced-risk products, and how it might contribute to disparities

in cessation, harm reduction, or sustained addiction."

With funding from an NIH Director's Early Independence Award, Giovenco aims to find out, by integrating data from geographic information systems, field studies, and smoke shop surveys. In his pilot studies, he discovered that the deadliest tobacco products are heavily marketed in communities with a higher proportion of people of color, whereas reduced-risk products are more prevalent in majority white neighborhoods. His current project investigates how exposure to this marketing may be associated with disparities in residents' harm-reduction behaviors and tobacco-related health hazards. Says Giovenco: "I hope my research can chart a course for risk-based regulation and answer questions about the validity and equity of tobacco harm reduction."



## Kidney Failure

*Biostats Team Solves SPRINT Puzzle*

In 2015, the *New England Journal of Medicine* published results of the randomized controlled Systolic Blood Pressure Intervention Trial (SPRINT). Involving 102 clinical sites and 9,361 participants, the trial was designed to reveal whether intensive blood pressure management could significantly reduce the incidence of heart and kidney disease, stroke, or age-related declines in memory and thinking, compared with the current standard of treatment. While the study confirmed that more aggressive blood-pressure control

further reduces the risk of heart disease, it also yielded a puzzling finding: SPRINT participants with chronic kidney disease had a lower risk of kidney injury when intensively treated than did those with normal renal function. Yet doctors have long observed the opposite: that interventions to control blood pressure actually increase risk of kidney damage.

To unravel the mystery, a team of Mailman School biostatisticians worked with nephrologists to reanalyze the trial data. They traced the problem to a discrepancy in how kidney injury was defined among SPRINT participants with normal kidney function, compared with those with



chronic kidney disease. After applying the same criteria to both groups, the team found that among people receiving more intensive treatment, baseline chronic kidney disease actually predicted a much higher risk of acute kidney injury.

Ongoing analyses will assess whether the benefits to heart health outweigh the risks of kidney damage from intensive blood pressure control.



## Not So Fast

*Biostatisticians Hit the Brakes on Screening*

In September 2016, the biotech company Abcodia pulled its \$295 ROCA blood test for ovarian cancer from the market in the United States. The decision came just days after the Food and Drug Administration issued a “safety communication” for women and their healthcare providers highlighting the risks associated with such tests and recommending against their use.

Ovarian cancer, known as “the silent killer” because its symptoms often don’t manifest until the disease has metastasized far beyond its origins in the reproductive tract, is the fifth-leading cause of cancer deaths among women; effective screening for the disease promises to save thousands of lives every year.

That’s why results of UKCTOCS—a randomized controlled study of approximately 200,000 British women followed over 14 years, making it the largest screening trial for ovarian cancer to date—were so eagerly anticipated and so heavily scrutinized when they were published by *The Lancet* in December 2015. The nonprofit Ovarian Cancer Research Fund assembled a group of experts—including Mailman School biostatisticians Bruce Levin, PhD, and Cody Chiuzan, PhD—to review the UKCTOCS data and the analysis published in *The Lancet*. Their review yielded serious concerns about the research and underlined the significant downside of screening using the Abcodia test kit. *American Family Physician* published their critique in a June 2016 editorial, which laid the groundwork for the FDA’s safety communication.

While there was nothing fraudulent about the UKCTOCS study, Chiuzan and Levin say its most promising results are the consequence of several misleading statistical contortions. The biostatisticians say the UKCTOCS team deserves credit for organizing such a complex and ambitious study, but further follow-up is needed before making any firm recommendations regarding the new screening tool.

Others have raised the possibility of financial bias in *The Lancet* paper—Ian J. Jacobs, MD, one of two lead authors, is also co-inventor of the risk of ovarian cancer algorithm (ROCA) and has a financial stake in the success of Abcodia’s test. “The real problem was the overenthusiasm of the investigators—with or without the financial impetus—to put spin on the findings that should not yet be touted as lifesaving,” says Levin. “The bottom line is that the screening test is not ready for prime time. We need more evidence of a benefit.”



In her keynote speech, Ertharin Cousin, JD (top), championed the role of evidence in public health. Richard Gamarra, MPH '17 (middle), receives his diploma from Dean Linda P. Fried, MD, MPH. Student speaker Shivani Bhatia, MPH '17 (bottom), was chosen by a committee of students, faculty, and staff.

# A Critical Time

## Members of the Class of '17 Honored

This year's commencement celebrations started early for 34 members of the Class of 2017, who were honored for outstanding achievements at a morning awards ceremony. Julie Kornfeld, PhD, MPH, vice dean for education, and Marlyn Delva, EdD, associate dean of student affairs and dean of students, presented the Campbell Award for "exceptional leadership and Columbia Spirit," the Outstanding Teaching Assistant Award, and the Bernard Challenor Spirit Prize for "commitment to building community across department boundaries." Department chairs presented 39 additional awards. "These awards honor the many ways the Class of 2017 have excelled as students, scholars, and leaders of the Mailman School community," said Kornfeld. "They are exemplary members of a distinguished class, all of whom are entering public health at a critical time, poised to make an important impact on the health of communities and to advance progress in the field of public health."

In the afternoon, family, friends, and faculty gathered to celebrate as more than 600 master's and 26 doctoral candidates received their degrees. Shivani Bhatia—an MPH graduate in Population and Family Health chosen by students, faculty, and staff—spoke on frailty and the human capacity for empathy.

Ertharin Cousin, JD, former executive director of the U.N. system's World Food Programme (WFP), gave the keynote address. During her eight-year tenure at WFP, Cousin led a staff of more than 14,000 in meeting urgent food needs in 80 countries while championing longer-term solutions to food insecurity and hunger. More recently, she has been working to raise more than \$5 billion needed to avert famine in conflict zones in Africa and the Middle East, where millions face starvation. In February, the U.N. declared a famine in parts of South Sudan wracked by civil war and a drought that has been exacerbated by climate change; Nigeria, Somalia, and Yemen face a similar plight. Fighting has restricted access, making humanitarian aid difficult and costly. "During a time," said Cousin, "when some political leaders question science, and when too many of our policy decisions regarding the availability and accessibility of food are driven by marketers and commodity markets, the Mailman School delivers the vital data and the analysis prerequisite for speaking truth to power."

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# Into the Streets

## A “Cultural Chameleon” Tackles Stroke Prevention

By the time neurologist Olajide Williams, MD, MS '04, was 18, he'd lived as long in London as he had in southwestern Nigeria, where he was born. These days he splits his time between Columbia University Medical Center/NewYork-Presbyterian Hospital and Hip Hop Public Health, a Harlem-based nonprofit he founded to combat the health risks that go along with being poor and black in the United States.

“I’m what you might call a cultural chameleon,” says Williams, who co-directs Columbia’s National Institutes of Health–funded Center for Stroke Disparities Solutions. “I’ve lived and worked in the poorest parts of Africa, and I was educated in the fanciest private schools in England. I’m equally comfortable hanging out until 3 a.m. in the toughest projects in Harlem and giving a lecture at the NIH.”

During his first few years in the U.S., Williams worked at both Harlem Hospital and CUMC. The disparities were stark. “In Harlem I had really desperate patients with no resources, overwhelmed with emotional challenges and all of the other social determinants that drive risk,” he says. “My patients at Columbia always had a better chance.”

To level the playing field, the neurologist put prevention first. As a master’s student in Biostatistics, he homed in on

high blood pressure, the root cause of 70 percent of strokes. People of color in the U.S. have long suffered higher rates of hypertension, as well as worse outcomes. Upping the ante, the low-income, high-risk New Yorkers Williams most wanted to reach were juggling multiple jobs and had more pressing concerns than healthy living. “What’s on their radar,” he says, “is how to put food on the table, look after their kids, keep a roof over their heads.”

Then the concept of “child-mediated health” caught Williams’s imagination. Unlike a doctor droning on about stress management, tobacco cessation, exercise, and a plant-based diet, kids are a lot harder to ignore. Especially when you share the same roof.

concepts stuck with his pint-size listeners. “The results were beyond what I dreamt,” says Williams, who performs live at elementary schools as the Hip Hop Doc, clad in scrubs and an outsize gold chain. “The secret formula is hip-hop.”

Over the past decade, Hip Hop Public Health has reached more than 1 million people and broadened its school-based programming to include materials on diet, exercise, the hazards of soda, and—in a nod to the multigenerational families in which its target audience resides—dementia.

As co-director of Columbia’s Wellness Center, opening later this year on the new Manhattanville campus, Williams will have



Where Williams saw kids, he saw earphones. So he tuned in to their soundtrack, then recruited recording executives and performers willing to craft kid-friendly rhymes with a stroke-prevention message. Later, as principal investigator for a series of NIH-funded studies, he tracked which

another chance to extend his reach through an array of peer education programs. “I don’t think that we, as physicians, will be able to realize the type of outcomes that our local communities desperately need,” he says, “if we do not venture out of the four walls of our hospitals.”



## A Friend of the Court

Lawyer James Kim, MPH '03

When the Supreme Court hands down its ruling in *Trump v. Hawaii* and *Trump v. International Refugee Assistance Project* later this year, James W. Kim, MPH '03, will be listening intently. A partner with the Washington, D.C., law firm McDermott Will & Emery who studied Health Policy and Management at the Mailman School, Kim was the pro bono lead counsel for an amicus brief in the Hawaii case, supporting

a temporary injunction against the president's executive order barring entry to the United States for people—including refugees—from six Muslim-majority countries.

Filed on behalf of the National Asian Pacific American Bar Association, the brief situates the question in American history, drawing attention to policies blocking immigrants from Asian and Pacific Island countries, such as the Chinese Exclusion Act of 1882—the first federal law to ban a group of people on the basis of their race—as well as the internment of Japanese-Americans during World War II. The 40-page brief argues that the executive order is in violation of religious protections in the Constitution, as well as the 1965 Immigration and Nationality Act, which dismantled nationality-based discrimination, lifting caps on the number of people from countries in Asia, Africa, the Middle East, and Southern and Eastern Europe.

"A return to the kind of system that discriminates based on an individual's place of birth," says Kim, "goes against the diversity upon which this country was built and has worked so hard to preserve."

The Hawaii case isn't the government contracts expert's first brush with immigration law. Since 2015, he has served as pro bono counsel to the National Queer Asian Pacific Islander Alliance and helped the group file an amicus brief in *United States v. Texas*, a Supreme Court case that blocked President Barack Obama's Deferred Action for Parents of Americans program, which could have delayed deportation for millions of undocumented immigrants.

"We will be involved in this case until the end," says Kim of the current immigration battle. "We're committed to following this through."



## Book Report

Author Chelsea Clinton, MPH '10

Since its inception in 1948, the World Health Organization has pursued a single objective: "the attainment by all people of the highest possible level of health." With 51 signatory countries and myriad other stakeholders, pursuing that goal hasn't been cheap or easy—and in the intervening decades the

organization's inner workings have grown ever more complicated.

For public health practitioners intent on understanding the WHO and other global public health players, a new book from Oxford University Press has a simple piece of advice: Follow the money. In *Governing Global Health: Who Runs the World and Why?*, authors Chelsea Clinton, MPH '10, PhD, and Devi Sridhar, PhD, use case studies of four leading organizations—WHO, the World Bank, Gavi, and The Global Fund to Fight AIDS, Tuberculosis and Malaria—to explore how financing and administration affect international public health initiatives. Clinton, adjunct assistant professor of Health Policy and Management, serves as vice chair at the Clinton Foundation in New York. Sridhar is professor and chair of global public health at the University of Edinburgh Medical School. Both earned doctorates at Oxford University.

When it comes to imposing accountability, understanding who holds the purse strings

is vital, say Clinton and Sridhar, whose book tour included a visit to the Mailman School. To prove their point, the authors use WHO's tangled financing. Donors, while generous, can earmark funds for certain purposes or specific regions of the world, limiting the director-general's discretionary ability, even in the face of an emerging crisis. Those hazards came into stark relief when a lack of readily available resources and a slow response to the 2014 Ebola outbreak led to more than 10,000 deaths. Yet not a single WHO employee lost their job, and while promises of change were made, very few have been realized.

"It is a bit of a classic chicken-and-egg challenge," says Clinton. "Will donors step up and provide the necessary resources for WHO to do its job, or will WHO have to prove itself more fit for purpose? Hopefully, the world won't face another crisis like Ebola or Zika in the meantime to remind us once again why it's so important that the world be more prepared."

## Great Grad

Awardee Benjamin Meier, PhD '09

In June, the annual Alumni Summit for Public Health Leadership recognized Benjamin Mason Meier, JD, LL.M., PhD '09, with the Out-

standing Recent Alumni Award. An associate professor at the University of North Carolina at Chapel Hill, Meier explores the intersection of public health, international law, and public policy through studies of the development, evolution, and application of human rights in global health. His students voted him Professor of the Year in Public Policy in each of the last

six years; he also received two university-wide teaching awards for courses in global health policy. He now holds the Zachary Taylor Smith Distinguished Chair in Public Policy.

As a doctoral student in Sociomedical Sciences at the Mailman School, Meier analyzed the evolution of human rights in the World Health Organization.

## March on Washington

Organizer Caroline Weinberg, MPH '12



In April, 40,000 people converged on Washington, D.C., for the March for Science to support well-funded, independently conducted,

evidenced-based science to inform policy. The global movement—co-chaired by Caroline Weinberg, MD, MPH '12—included marches in 600 cities, sponsorship from 300 scientific partner organizations, participation by thousands of volunteers, and 1 million followers on social media.

Conceived less than four months earlier, the march brought together scientists, science teachers, and members of the general public alarmed by President Donald Trump's promotion of deep cuts to science funding, most recently in his proposed 2018 budget. Weinberg, a science journalist and health advocate, calls any cuts to science "spectacularly shortsighted" because they ignore its value for health, the environment, and the economy. "All people will suffer," she says, "regardless of whether they support science or not."

Since the nonpartisan gatherings in April, Weinberg and her co-organizers have leveraged the outpouring of interest in the March for Science to form a nonprofit committed to strengthening the role of science in policymaking, improving science outreach and communication, advancing science education and literacy, and fostering a diverse and inclusive scientific community. "Who science benefits and what research is done are influenced by politics," says Weinberg. "Science belongs in policy. People who think it shouldn't be are devaluing science and scientific research. It must be involved in policymaking for the benefit of people worldwide."

## A Lasting Legacy

Benefactor Sanford Bolton, MS '66



Sanford M. "Sandy" Bolton, PhD, was an established professor of pharmacy at the University of Rhode Island in 1964 when he determined to get a better handle on the number crunching that drives such efforts as assessing a drug's efficacy or optimizing its formulation. He took a two-year hiatus and earned a second master's degree in Columbia's Department of

Biostatistics. Bolton would go on to work in industry, chair the Pharmacy Department at St. John's University, and author *Pharmaceutical Statistics: Practical and Clinical Applications*, a textbook in print since its publication in 1984 through its fifth edition, issued in 2009. In addition to having a passion for science and mathematics, he was an amateur guitar maker and music enthusiast.

Bolton, who died in 2011, was the first benefactor of the Mailman School's Biostatistics and Epidemiology Summer Training (BEST) Diversity Program and established the Sanford Bolton–John Fertig Award in Biostatistics for the best doctoral dissertation. This year, the department received a gift of \$313,000, the first disbursement from his estate. To honor Bolton's commitment to supporting underrepresented students and those with financial need, Department of Biostatistics Chair F. Dubois Bowman, PhD, says the gift will be used to support graduate students with an interest in pharmaceutical statistics and expand the BEST program. "The Department of Biostatistics was such an important turning point in his life," says estate trustee Eric Warren Goldman, who recalls visiting Bolton and his wife, Phyllis, an accomplished painter, during their years in Washington Heights. "The Boltons consistently wanted to share some of their good fortune."





Mary T. Bassett's family gathered with descendants of Frank Calderone and Mailman School students, staff, and faculty for the Calderone Lecture, given this year by Bassett in honor of her transformational work in public health. Dean Linda P. Fried presented the award, and Francesca Calderone-Steichen gave the opening remarks. Photos (left three) by Leslie Smith; (right) by Roj Rodriguez.

## On the Color Line

### *Calderone Prize Awardee Mary Bassett Calls for Racial Healing*

In October, the Mailman School honored New York City Department of Health and Mental Hygiene Commissioner Mary T. Bassett, MD, MPH, with the Frank A. Calderone Prize for her transformational contribution to the field of public health. In an original lecture she gave at the award ceremony, titled “Public Health Meets the Problem of the Color Line,” Bassett discussed how racism and white supremacy have undermined health for all Americans. The burdens of race and class are often conflated, she noted, obscuring the insights that emerge from directly confronting racism.


“An anti-poverty lens might look at the higher rates of obesity and diabetes among populations of color and conclude that the problem to address is the prohibitively high cost of good food. There’s truth to that analysis. It is more expensive to eat a healthy diet and avoid diet-related diseases. The solution to this problem, understood in this fashion, would be to subsidize fruits and vegetables or reduce prices somehow to facilitate their purchase.

Adopt a racial justice lens, though, and you will see [that] is not enough. Because of the legacy of redlining, neighborhood

disinvestment, farmers markets (not to mention full-service grocery stores) are far less likely to open in low-income communities of color, and if they do, they tend to cater to residents who reflect a wave of gentrification. The answer here requires further action. We need to address what some are beginning to call ‘food apartheid’ in rapidly gentrifying neighborhoods.

An anti-racist lens doesn’t just see the factors associated with poverty, but the entire historical dossier of policies, norms, and actions—the joint social relations of race and class.”





“I was raised in a community suffering from health disparities. Receiving a scholarship has meant that I can focus on gaining the skills and knowledge I need to serve the community and confront complex health issues.”

—Koma Ogaye MPH '17

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