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# Pandemic

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# Pandemic

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# Coming Together in a Pandemic



COVID-19 has done its best to pull us apart, disrupting nearly every aspect of how we live, learn, and work. Since the first reports of the new coronavirus, I have watched with gratitude as our community—students, faculty, staff, alumni, and friends—joined together to face unprecedented challenges with grace, compassion, and resilience. I would like to express my sincere condolences to those of you who have lost loved ones during the course of this pandemic. Our thoughts are with you.

Early on, our faculty partnered across disciplines and sectors to answer vital questions about the virus and its spread, advise policymakers and the scientific community, guide Columbia’s university-wide response, support clinical care response, and inform the public through media and other outreach. In many cases the foundation for their work was developed years ago in anticipation of this moment. Our students responded to the pandemic in myriad ways, including volunteering with the CUIMC Student Service Corps, working as contract tracers, developing healthcare service-learning projects, serving as campus safety ‘ambassadors’, and raising awareness of critical health issues at the community level. Around the world, our alumni are working in hospitals, national health ministries, local health departments, scientific research organizations, and elsewhere to contain the virus.

The pandemic has awakened the world to the paramount importance of public health, which has seen declining investment in recent years. The disparate and devastating toll of COVID-19 on marginalized groups, including Black and Latinx communities in the U.S., and vulnerable and displaced populations around the world, has laid bare vast health disparities and inequities. The tragic violence in the U.S. against Black and Transgender communities, particularly Transgendered people of color, which is just the latest in a long line of violence, shows how much we need to do, individually and collectively, to create an antiracist and inclusive society. As ever, it is our mission as public health professionals to ensure every person’s right to health, dignity, safety, and wellbeing. We must act with renewed urgency. As the pandemic evolves and we establish a “new normal” I am confident that as a community we will continue to be there for each other and for the public whose health we work to protect.

Wishing you good health,

Dean Linda P. Fried, MD, MPH



Students attend virtual orientation on Zoom.

## Logged in and Learning

STUDENTS SCATTERED TO THE WINDS AS THE COVID-19 PANDEMIC DESCENDED, but classes continued online, essentially uninterrupted. “Even in the middle of a pandemic—especially in the middle of a pandemic—the value of a public health education has never been more evident,” says Dean Linda P. Fried, MD, MPH. “I’m proud of everyone who made this transition happen. It is inspiring to see us adapt as a community in the face of this emergency.”

As New York’s tally of COVID-19 cases climbed, the rapid move to virtual classrooms took a massive, coordinated effort. The School’s Board of Advisors and other donors provided funding to help students quickly move off campus. Teaching assistants mastered using Zoom. Office of Education staff created an online repository of best practices. The HR and IT teams provided crucial support. Wellness, career services, and academic support all continued from a distance. The Office of Diversity, Culture, and Inclusion hosted a virtual town hall. Student groups met on Zoom.

Even before the pandemic, the School was on a digital learning path, developing well-designed programs intended for the long term. Some

faculty were already familiar with distance learning through the Department of Epidemiology’s Episummer@Columbia program. Those new to it rapidly became adept, teaching and making themselves available through virtual office hours. The Department of Biostatistics hosted weekly “T-time” sessions, fostering a sense of community with virtual trivia games. Sharon Schwartz, PhD, professor of Epidemiology, invited students to contact her if they needed help getting groceries. “Social distancing doesn’t mean we have to lose our sense of community,” says Alexis Smith ’20, who TA’d a class from her childhood bedroom in southeast Alabama. “It felt good to check in and see everyone, even at a distance.”

Photographs, from left: Eileen Barroso; Diana Gazzia; courtesy of CAPRISA.

### HONORS

#### Salim and Quarraisha Abdool Karim recognized for HIV breakthrough



Epidemiology professors Salim Abdool Karim, PhD, DSc, and Quarraisha Abdool Karim, PhD, were named the 2020 John Dirks Canada Gairdner Global Health Award laureates for their outstanding achievements in global health research. The Abdool Karims, who are married, received the award for their discovery that antiretrovirals prevent sexual transmission of HIV, which laid the foundation for preexposure prophylaxis (PrEP), the HIV preventive now used around the world. Both of the Abdool Karims hold appointments at the University of KwaZulu-Natal, →

➔ South Africa; Salim Abdool Karim is also chair of the UNAIDS Scientific Expert Panel and WHO's Strategic and Technical Advisory Group on HIV and Hepatitis. He is also director of CAPRISA and Quarraisha is its associate scientific director.

### Two faculty members elected to National Academy of Medicine

Election to the National Academy of Medicine is one of medicine's highest honors. Charles Branas, PhD, Gelman Endowed Professor of Epidemiology, and chair of the Department of Epidemiology, and Andrea Baccarelli, MD, PhD, Leon Hess Professor and Chair of the Department of Environmental Health Sciences, have both been named members. Branas is known for his scientific leadership on gun violence prevention and his work on access to medical care. Baccarelli was recognized for being among the first to show that environmental chemicals and lifestyle risk factors adversely affect the human epigenome.

### Lesley A. Sharp named a Guggenheim Fellow

Lesley A. Sharp, PhD, a senior research scientist in Sociomedical Sciences at Columbia Mailman School of Public Health and a member of the faculty of Barnard College, has been named a Fellow of the John Simon Guggenheim Memorial Foundation. One of 175 honorees selected from nearly 3,000 applicants, she was recognized for research that addresses inmate-run, prison-based hospice programs. As a medical anthropologist, she has focused on the ethical and moral considerations in human-animal encounters in lab research, organ donation and transplantation, and experimental biotechnology.

### W. Ian Lipkin honored by the government of China

The government of China honored W. Ian Lipkin, MD, with a medal recognizing his profound impact on the country. For nearly 20 years, Lipkin, the John Snow Professor of Epidemiology and director of the Center for Infection and Immunity at Columbia Mailman School of Public Health, has worked closely with scientists and officials in China to strengthen its public

## Students Take a Stand



From left: Austin, Greenberg, Karp.

**ADVOCATING EFFECTIVELY FOR PUBLIC HEALTH MEASURES IS A CRITICAL SKILL** for Columbia Mailman School graduates, and first-year students practice speaking up by writing op-eds. Written with passion and persuasion, the articles promote policies to improve health and social justice for marginalized groups.

In a historical look at the systematic marginalization of midwives, Kennedy Austin ('21) argued that the profession has the potential to redress both shortages and racial disparities in maternal healthcare. Meanwhile, Mara Greenberg ('21) examined the role highways have played in segregating urban populations and how infrastructure projects could heal these wounds. Other students took on discrimination against Indigenous people's health practices and the debate over requiring bike helmets for bike-sharing programs. After the pandemic began, still others covered topics related to COVID-19. At Columbia Mailman School, "we've been exposed to issues impacting myriad marginalized communities, including LGBTQ+ individuals, ethnic and racial minorities, immigrants, and refugees. I really appreciate that I've been able to discuss these issues openly in a safe space with my peers," says Veronica Karp ('21) who wrote about doctors' stigmatization of mental illness. "I think that my ability to hear different perspectives has made me a more competent public health professional."

## A Deeper Focus on Climate and Health

Environmental Health Sciences has gained new faculty members as the School expands its Climate and Health Program.

**LEWIS ZISKA, PhD**, one of the world's leading experts on the effects of climate change on plants and agriculture, joined the School as associate professor of Environmental Health Sciences after nearly 25 years at the United States Department of Agriculture. "I'm excited to continue my research in an environment where climate change is about science, not politics," he says. At the International Rice Research Institute in the Philippines, Ziska did some of the first research into how rising CO<sub>2</sub> corresponded with a reduction in rice protein. He has contributed to several United Nations Intergovernmental Panel on Climate Change reports.

**JOAN CASEY, PhD**, a new assistant professor, uses electronic health records

and spatial statistics to study the relationship between emerging environmental exposures and health. She investigates exposures that occur from natural gas and oil development, noise pollution, and concentrated animal feeding operations. Her work considers vulnerable populations and health disparities.

**MAYA DEYSSENROTH, DrPH '14**, another new assistant professor, is a molecular epidemiologist. She studies pathways through which the placenta conveys intrauterine exposures and their effect on postnatal health. She incorporates biostatistical and bioinformatic tools to evaluate multi-pollutant exposures. She is both an alumni of Columbia Mailman School and a former EHS research associate.



## Columbia Mailman School Commits to Becoming an Antiracist Institution

**AS MASS MOBILIZATIONS AGAINST THE KILLINGS OF BLACK AND TRANSGENDER PEOPLE FILLED STREETS**, Dean Linda P. Fried, MD, MPH, announced a schoolwide initiative called FORWARD (Fighting Oppression, Racism, and White supremacy through Action, Research, and Discourse) to accelerate the School's efforts to transform into an antiracist, multicultural, and fully inclusive institution. FORWARD aims to expand the pipeline of Black, Indigenous, Latinx, Asian, and Middle Eastern and North African students into Columbia Mailman School and from here into the field of public health. The program will also focus on recruiting faculty and staff from these groups; deepening ties with local, marginalized communities; and creating a more robust, school-wide research effort into health inequities and racism.

FORWARD is comprised of the Action Corps, groups that currently total more than 100 student, faculty and staff volunteers. The FORWARD Accountability Cabinet, a permanent multi-stakeholder advisory body to the Dean, will develop measures of success and continually assess progress towards goals, and provide oversight of the Action Corps. The Cabinet is co-chaired by Charles Branas, PhD, chair of the Department of Epidemiology, and Raygine DiAquoi, EdD, assistant dean, Office of Diversity, Culture, and Inclusion.

FORWARD builds on the School's longstanding focus on racial justice and equity. In 2016, it created the Office of Diversity, Culture, and Inclusion, which launched the RISE

mentoring program for students of color and first-generation graduate students. FORWARD's work has been advanced by a set of early commitments made by Dean Fried in June 2020, which include mandatory racial awareness, anti-bias and inclusion training for all students, faculty and staff; additional funding for student mentoring and scholarships; and support to help recruit and nurture promising faculty. "Racism is a social determinant of health; thus, public health is inherently an anti-racist endeavor. Our field has committed to addressing how structural racism engenders and perpetuates health inequities and FORWARD helps us fulfill this promise," says DiAquoi.

health system and protect its people from infectious disease outbreaks. Read more about his work on page 12.

### **Diana Hernández recognized by New York League of Puerto Rican Women**

Diana Hernández, PhD, assistant professor of Sociomedical Sciences, was awarded the Public Health Service Award from the New York League of Puerto Rican Women. Hernández studies the impacts of policy on the health and socioeconomic well-being of vulnerable populations. Her community-oriented research examines the intersections between housing and neighborhoods, poverty, equity, and health, with a particular emphasis on energy insecurity. Much of her research is conducted in her native South Bronx neighborhood.

### **Terry McGovern named to Council on Foreign Relations**

Terry McGovern, JD, professor and chair of the Heilbrunn Department of Population and Family Health, was invited to join the Council on Foreign Relations, the U.S. membership organization and think tank specializing in foreign policy and international affairs. The Council is a resource on foreign policy choices for government officials, business executives, journalists, educators, and civic leaders. McGovern is founder and director of the School's Program on Global Health Justice and Governance. Her research focuses on health and human rights, sexual and reproductive rights and health, gender justice, and environmental justice.

### **Crain's New York Business honors School faculty and alumni**

The publication's 2020 Notable in Health Care list applauded Dean Linda P. Fried, MD, MPH, who "engineered a strong response to COVID-19 on multiple fronts." Craig Spencer, MD, MPH '13, assistant professor of Emergency Medicine and Population and Family Health, was recognized as a "trusted source of information and insights" during the pandemic. Alumni James Gasperino, MPH '11, and Anthony Shih, MPH '01, were also honored.

**SUPPORTING OUR WORK****Huo Scholars Program continues**

Columbia Mailman School alumnus and Board of Advisors member Xue Fang, PhD, MS '98 has pledged renewed support from the Huo Family Foundation with a commitment of \$2.5 million over five years. Each of the five annual Huo Scholars receives a two-year scholarship along with a practicum stipend valued at \$40,000 per year. In addition, the Foundation will support 20 summer practica in public service each year for the next five years. The goal is to enable scholars to focus on public service practica, which are usually unpaid.

**Bristol Myers Squibb Foundation helps ICAP train health workers**

A gift of \$100,000 from the Bristol Myers Squibb Foundation is supporting ICAP's training of frontline health workers to mitigate COVID-19 in Eswatini, Ethiopia, and Tanzania. Leveraging ICAP's strong partnerships and vast network of community health workers, the gift funded the rapid design and implementation of training that prioritizes essential, functional competencies required to effectively respond to the pandemic.

**The Anahata Foundation makes a critical climate gift**

The Anahata Foundation has stepped up its support for the Global Consortium on Climate and Health Education (GCCHE), pledging to fund the recruiting and salary of a director for the Consortium over two years. The Foundation has consistently supported the GCCHE, and this gift helps ensure strong and continuing leadership during a critical time for climate science.

**Jack Rudin Family Foundation supports CII**

The Jack Rudin Family Foundation made a gift of \$1.5 million to the Center for Infection and Immunity to fund COVID-19 clinical trials. The contribution provided aid for an assessment of hydroxychloroquine and a multistage project to identify FDA-approved drugs to treat or prevent COVID-19.

# PopFam Speaks Out on Reproductive Health

**DURING AN ERA OF INCREASING RESTRICTIONS ON ACCESS TO REPRODUCTIVE HEALTH SERVICES IN THE UNITED STATES**, the Heilbrunn Department of Population and Family Health has launched an online forum focused on reproductive health justice, #SpeakEvidencetoPower. "It is critical that evidence, not ideological zeal, is the driving force for policy," says chair Terry McGovern, JD. "The sexual and reproductive health of millions of people in this country and globally is at stake."

The platform provides scientific evidence supporting access to a range of reproductive health services and serves as a resource to researchers, advocates, and the media. Leading thinkers in the field, including Phumzile Mlambo-Ngcuka, executive director of UN Women, and Winnie Byanyima, executive director of UNAIDS, have shared their expertise on current issues and news. "Information is power," says McGovern. "It will lead to informed action and promote justice for reproductive health."



Serra Sippel (left), president of the Center for Health and Gender Equity, and PopFam chair Terry McGovern attend the rally for reproductive justice on March 4, 2020.



Students and other members of the School's community join in a "Speak Out for Reproductive Health and Justice" event on campus after the 2019 election.





## What Comes After a Pandemic? Syndemics

**T**he global pandemic is in the spotlight, but experts at the School are already raising concerns about its downstream effect on other public health crises. The economic downturn and high unemployment are driving concerning trends in suicide and an increase in opioid-related fatalities. Symptoms of anxiety disorder and depressive disorder increased considerably in the United States between April and June of this year, according to *Morbidity and Mortality Weekly Report*. And spikes in gun purchases beginning in March were followed by significant increases in firearm fatalities in April and May when compared to the same months in 2019.

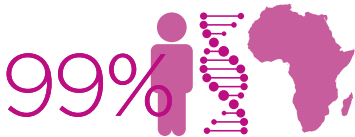
Charles Branas, PhD, Gelman Professor of Epidemiology and chair, Department of Epidemiology, believes these trends are best examined through a syndemic lens. His focus is on gun violence. “Equity and social justice issues are longstanding and an epidemic unto themselves, and when you mix them with COVID-19 you get a syndemic. The two feed on each other and make the outcome

much worse.” Fixing syndemic problems requires a multifocal approach. Branas points to a program called Operation Peacemaker Fellowship in Richmond, California, as an example. Young people who have been involved in gun violence are given stipends, mentorship, job training, and other benefits. This has been shown to significantly reduce the likelihood of future gun crimes. Faculty Kara Rudolph, MPH, PhD, and Katherine M. Keyes, MPH, PhD, did research that supports this and similar violence interruption programs.

Branas hopes that future solutions to gun violence will arise out of the SURGE program (Scientific Union for the Reduction of Gun Violence), which he and others launched in February with a consortium from across Columbia University to make gun violence a top focus for Columbia and promote scientifically supported solutions. The group has already logged one success: Earlier this year, SURGE led universities to petition legislators to provide CDC and NIH grants for gun violence research, the first such grants from these agencies in decades.

## Seeking the Origin of Schizophrenia in Africa

An international group of scientists, including investigators from Columbia Mailman School and the New York State Psychiatric Institute, as well as the University of Cape Town and the University of Washington, has conducted the first genetic analysis of schizophrenia in an ancestral African population, the South African Xhosa. Africa is the birthplace of all humans, and almost 99 percent of human evolution took place in Africa before humans migrated from Africa to Europe and Asia 50,000 to 100,000 years ago. Yet ancestral African populations have rarely been the focus of genetics research.



The researchers analyzed blood samples collected from 909 individuals diagnosed with schizophrenia and 917 controls living in South Africa. Their study, published in *Science*, revealed that people with schizophrenia are significantly more likely than others to carry rare, damaging genetic mutations. (There is no evidence that the Xhosa have an unusually high risk of schizophrenia.)

The genes and pathways identified by this research inform the understanding of schizophrenia for all humans, the researchers say. Further studies in African populations might also suggest potential mechanisms for the design of more effective treatments. “The presence of only a few DNA variations damaging to synaptic function could have an outsized effect on schizophrenia,” says co-author Ezra Susser, MD, DrPH, professor of Epidemiology and Psychiatry at the Columbia Mailman School, Columbia University Irving Medical Center, and New York State Psychiatric Institute.



## Sounding a Warning on COVID-19 and Obesity

Early on in the pandemic, Andrew Rundle, DrPH, associate professor of Epidemiology, drew national attention by predicting that school closures would exacerbate the epidemic of childhood obesity in the United States. Writing in the journal *Obesity*, he noted that the data show that children experience unhealthy weight gain primarily during the summer months when they are out of school. This is particularly true for Black and Latinx youth, as well as children who are already overweight, and weight gained is typically maintained during the school year.

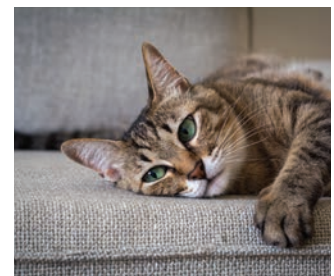
During the pandemic, households stocked up on ultra-processed shelf-stable foods and calorie-dense comfort foods. Social distancing and stay-at-home orders reduced opportunities for exercise, particularly in urban areas. And video game usage soared. Rundle presented several interventions, including providing grab-and-go meals at schools to reduce food insecurity, which is linked to unhealthy weight among children. He also recommended making physical activity an aspect of online schooling, which will continue to be critical in the winter.

## Your Sofa Could Make Your Cat Sick

Cats exposed to flame retardants found in sofas may be at greater risk for feline hyperthyroidism according to a study by researchers at Columbia Mailman School and Oregon State University.

For the study, 78 cats wore silicone collar tags that picked up contaminants in the air; their owners filled out a questionnaire. When the researchers analyzed the tags, they found higher levels of TRIS, a common flame retardant in stuffed furniture, air fresheners, and plastics—on the tags of hyperthyroid cats, in comparison to those worn by non-hyperthyroid animals. The amount of TRIS in use in the U.S. has risen more than 50-fold over the past 20 years; cases of feline hyperthyroidism have also climbed precipitously during this period.

“We want a healthy home for our animals and ourselves,” says Julie Herbstman, PhD, a study co-author and director of the Columbia Center for Children’s Environmental Health. “What we’re seeing in cats is a warning sign that exposure to these chemicals may disrupt the human thyroid system as well.”





## A New Perspective on Bullying

Youths who report that they have been the perpetrators of bullying are more likely to develop mental health problems compared to those who say they don't bully others, new research shows.

Previous studies have focused on the causes and consequences of bullying victimization, but this research breaks new ground. “While it is well documented that being a victim of bullying is associated with immediate and lifelong mental health problems, this is the first to comprehensively examine the hypothesis that the relationship between bullying perpetration and mental health problems may be bidirectional,” says Marine Azevedo Da Silva, PhD, a postdoctoral researcher at the Columbia Mailman School.

The researchers analyzed data from 13,200 youths aged 12 to 17 years. Among them, 21 percent reported ever having bullied others, with 16 percent reporting having bullied others over a month ago and

5 percent reporting having bullied others in the past month. The results are published online in the *Journal of Adolescent Health*. Among the findings: Bullying perpetration increased the risk of developing internalizing problems—such as depression, withdrawal, anxiety, and loneliness—and having internalizing problems also increased the probability of bullying others.

“Our findings indicate that bullying prevention and intervention strategies among youth should consider how to take into account and handle negative feelings and mental health problems” in a healthy way, notes Silvia Martins, MD, PhD, director of the Substance Abuse Epidemiology Unit of the Department of Epidemiology and senior author.

## Insurance and Pregnancy: A Dangerous Gap

Black, Hispanic, and Indigenous women are more likely to lack insurance for some period around the time of pregnancy than white women, a new study by researchers at Columbia Mailman School and the University of Michigan suggests. Nearly half of all Black, Hispanic, and Indigenous women had no coverage at some point between preconception and after delivery compared to about a fourth of white women, according to the research published in *Obstetrics and Gynecology*. Spanish-speaking Hispanic women had the lowest rates of steady insurance.

The study comes as Black and Indigenous women are two to four times more likely to die from pregnancy-related causes compared with white peers. “Racial and ethnic disparities in maternal and child health outcomes are a national public health crisis,” says senior author Lindsay Admon, MD, an obstetrician-gynecologist at Michigan Medicine’s Von Voigtlander Women’s Hospital. The researchers analyzed data from 107,921 women in 40 states between 2015 to 2017 for the study.

Income gaps between white and Black populations play a big role in insurance disparities. But among the biggest factors for disrupted care is Medicaid discontinuity. Pregnancy-related Medicaid coverage is only offered for up to 60 days after a baby’s birth, but there are bipartisan federal and state efforts to extend the coverage to a year. “Medicaid stability before and after pregnancy is critical for ensuring continuity of coverage and access to care for women of color,” says lead author Jamie Daw, PhD, assistant professor of Health Policy and Management at Columbia Mailman School. Improving coverage before conception is also critical in identifying underlying health issues that may negatively affect a mother’s or baby’s health.





Sonalee Rau, MPH '20, helped revive a man in East Harlem using naloxone.

## A Hands-On Solution for Opioid Overdose

Since mid-2019, Columbia University's naloxone training program, a partnership among Columbia Mailman School, Columbia Health, and the Columbia School of General Studies, has trained 1,342 students, faculty, and staff to recognize signs of opioid overdose and administer potentially lifesaving naloxone. After completing an hourlong training, trainees receive a free naloxone kit provided by New York City's Opioid Overdose Prevention Program.

The training initiative, launched in response to the rising concern around opioid usage and potential for overdose on college campuses, has generated strong interest. In a roundtable hosted by the Office of National Drug Control Policy last fall, Rachel Shelton, ScD, MPH, assistant professor of Sociomedical Sciences, was among the Columbia representatives who shared insights and presented recommendations for facilitating engagement in training among special populations including athletes, resident advisors, fraternity and sorority members, veterans, and students in recovery. The audience of government representatives and attendees from other academic institutions took away actionable advice on how to bring naloxone to more campuses.

The initiative, funded by two grants from Columbia's Irving Institute CTSA Collaborative and Multidisciplinary Pilot Research Awards, has provided an opportunity to address the dearth of research on naloxone training and use of the therapy in university settings and contributed crucial learnings to the field of college health. Data collected will help investigators assess participant interest, motivation, and attitude. The team seeks to understand the level of concern around administering naloxone, including potential punitive or legal implications; assess the confidence and willingness created in participants to carry and administer naloxone; and consider opportunities and barriers to expand the program to other college campuses nationally.

Trainings have continued during the pandemic, with attendees at 35 virtual trainings receiving naloxone kits by mail. The best news of all? Thus far, graduates from the program have saved six lives.

## Reaching Teens with HIV in Africa

Adolescence is a time of emotional turmoil and for young people living with HIV in Africa, stigma, loneliness, and poverty can increase the burden. ICAP is piloting innovative projects designed to reach adolescents with HIV care, treatment, and prevention, as well as psychosocial support. Reaching young people is key to eventually controlling the epidemic worldwide.

**In Kenya**, with the support of a philanthropic gift from Alan and Jane Batkin, ICAP is expanding its successful photography workshops and entrepreneurial leadership training program, opening new avenues for young people with HIV to express themselves creatively through photography while also earning income to help them live independently.

**In Tanzania** and nine other sub-Saharan African countries, the DREAMS program is helping girls and young women living with HIV develop into Determined, Resilient, Empowered, AIDS-Free, Mentored, and Safe women. With funding from the U.S. President's Emergency Plan for AIDS Relief (PEPFAR), ICAP provides reproductive health and education services, HIV testing, peer support, and economic empowerment training for young women aged 15 to 24 years.

**In Mozambique**, adolescents with HIV struggle with stigma and often shy away from health facilities. ICAP is creating adolescent- and child-friendly areas at three of the largest health facilities in Nampula province, transforming "empty" wait time into an opportunity to provide adolescents with support from peers who are also living with HIV. Says Mirriah Vitale, MPH, ICAP country director in Mozambique, "these groups have struggled to gain the benefits of HIV care and treatment and now we look forward to seeing the positive impacts."





## Mexico: Focusing on Folate

Up to 32 percent of Mexican girls aged 14-18 years and between 9 and 28 percent of the country's women aged 19-39 years continue to have folic acid (FA) intake levels below the World Health Organization (WHO) recommended amount, potentially raising the risk for neural tube defects in their offspring. Fortification of wheat and corn flour with FA was mandated in 2008 but without enforcement. Manuela Orjuela-Grimm, MD, assistant professor of Epidemiology and Pediatrics, and other researchers collaborated with the National Institute of Public Health, Mexico, to measure the nutrient's content in bakery bread and tortillas collected from geographically diverse areas. They then extrapolated these data to the larger population, using intake tables from a 2012 national health and nutrition survey. They found that overall folate intake improved, but is still below the WHO goal. Corn tortillas from rural areas were especially likely to lack the nutrient. The researchers also determined that up to 1.9 million young children are at risk of ingesting FA at levels *above* the tolerable upper limit, a potential cancer risk. "More oversight of fortification may avoid health risks from overexposure, as well as insufficient intake in the population initially targeted by the fortification program," says Orjuela-Grimm.

## An Unexpected Gender Pay Gap

Before the COVID-19 pandemic, the United States had seen a dramatic rise in nontraditional "gig economy" jobs where workers are hired for single projects, often on a short-term basis. Researchers at Columbia Mailman School and Cloud-Research.com identified a gender pay gap among gig workers, determining that, on average, women's hourly earnings were 10.5 percent lower than men's.

The researchers examined the work of over 20,000 men and women who completed more than 5 million tasks online in Amazon's Mechanical Turk (MTurk) platform, which connects employers ("requesters") to employees ("workers"). "Due to the platform's anonymity, workers' self-selection into tasks, the relative homogeneity of the tasks performed, and the flexible work scheduling, we did not expect earnings to differ by gender on this platform," said Zohn Rosen, PhD, lecturer in the Department of Health Policy and Management. "However, contrary to our expectations, a robust and persistent gender pay gap was observed." Adds Lisa Bates, ScD, assistant professor of Epidemiology, "Our results showed evidence of a gender wage gap not fully accounted for by such factors as task heterogeneity, experience, and task completion speed." A significant portion of the gap seems to result from women selecting tasks that have a lower advertised hourly pay. Writing in the journal *PLOS ONE*, the authors hypothesize, "Women may select lower-paying tasks because cumulative experiences of pervasive discrimination lead women to undervalue their labor."



## The Weight/ Prostate Cancer Connection

Being overweight in middle age is linked to many health problems, and we can add a greater risk of advanced prostate cancer to the list, shows research led by Jeanine Genkinger, PhD, associate professor of Epidemiology at Columbia Mailman School. Prostate cancer is the second most common cause of cancer in U.S. men and fewer than one in three men with advanced prostate cancer live five years beyond diagnosis.

### GREATEST RISK

AGE: 50-64  
BMI: >25  $\frac{\text{kg}}{\text{m}^2}$

Using data from 15 large studies combined, Genkinger determined that a body mass index over 25  $\text{kg}/\text{m}^2$  during middle to late adulthood (median age of 50 to 64 years) was linked to the greatest risk for developing advanced prostate cancer. They also found that greater waist circumference was linked with increased risk of advanced prostate cancer and death. Published in the *Annals of Oncology*, this is the first study to connect waist circumference with elevated risk. "Adopting and maintaining healthy weight in middle to late adulthood can especially reduce risk of advanced prostate cancer," says Genkinger.

# Prepared for a Pandemic

Experts from every corner of the Columbia Mailman School campus mobilized quickly when a devastating pneumonia-like illness surfaced and quickly swept around the globe. After all, they had been warning that this moment was coming for years.

By Jim Morrison



**"I hate to say it, but this is the worst respiratory viral pathogen we've faced since 1918."**

**W**hen the first news of what would become a global pandemic emerged from China, the world's leaders immediately turned to researchers at the Columbia Mailman School, who moved with lightning speed to begin unraveling the mysteries of the novel coronavirus. The scientists were tapping a deep well of innovative research and policy expertise going back decades. From discerning who is particularly vulnerable to the virus and why, to determining how an infection spreads, to developing diagnostic methods and treatments, Columbia Mailman School experts supplied critical data and advice to governments, nonprofit organizations, and private sector entities. Even as the campus and the city closed down, the School's researchers, staff, and students worked into the night building vital knowledge that decision-makers would use to determine how to address the rapidly evolving crisis.

For many of those at Columbia Mailman School, the battle against COVID-19 was only the latest in a decadeslong fight to prevent and combat deadly outbreaks. But this one was unlike any others. For decades, Earth has been primed for a pandemic: Airplanes speed pathogens across borders; humans encroach on animal habitats (COVID-19 likely started with an animal infection); and climate change expands the range of disease-carrying insects. Meanwhile, countries, including the United States, have disinvested in public health systems that prevent disease in recent decades. Despite all the ingredients for a perfect storm,

"you always wonder if you're really going to see something like this," says Jeffrey Shaman, PhD, the director of the Climate and Health Program and an expert on disease transmission. "I hate to say it, but this is the worst respiratory viral pathogen we've faced since 1918."

### **Virus Hunter vs. Virus**

**I**t was only natural that W. Ian Lipkin, MD, the John Snow professor and director of the Center for Infection and Immunity (CII), heard about the novel virus from a colleague in Guangzhou a month before the rest of the world became aware of it. One of the foremost authorities on infectious agents, Lipkin has hoppedscotched the globe helping tamp down outbreaks over three decades. In late January, he spent a week in China advising the Chinese government and top scientists about its response to the mysterious illness. He and his team at CII collaborated with Chinese scientists to identify and control the SARS coronavirus outbreak there in 2003. "Methods that we've piloted over the past 15 years enabled the discovery of this new coronavirus," he says. "These techniques allow researchers to take samples from individuals who had an unknown disease and to identify the causative agent very quickly."

Lipkin has earned the title of "virus hunter" for revolutionary research that has transformed the speed at which health authorities respond to emerging infections.

He and his team have discovered more than 1,800 infectious agents. In recent years, they worked on outbreaks of West Nile virus, SARS, MERS, and others. (In the 2011 movie *Contagion*, for which Lipkin served as scientific consultant, Elliott Gould's character, a scientist named Dr. Ian Sussman, was based on Lipkin.)

Until October of last year, CII was deeply engaged in PREDICT, the United States Agency for International Development-funded decadeslong program to detect viruses with pandemic potential in animal hosts and to examine how they make the leap into humans. CII researchers were among the first to show that bats were an animal reservoir for coronaviruses such as SARS-CoV-1, MERS CoV, and SARS-CoV-2. A significant source of support for their work with bats, the PREDICT study was abruptly shuttered, its funding pulled only weeks before the first cases of the novel coronavirus were reported in China. This would prove to be just one example of how poorly prepared the United States was to face new viral threats.

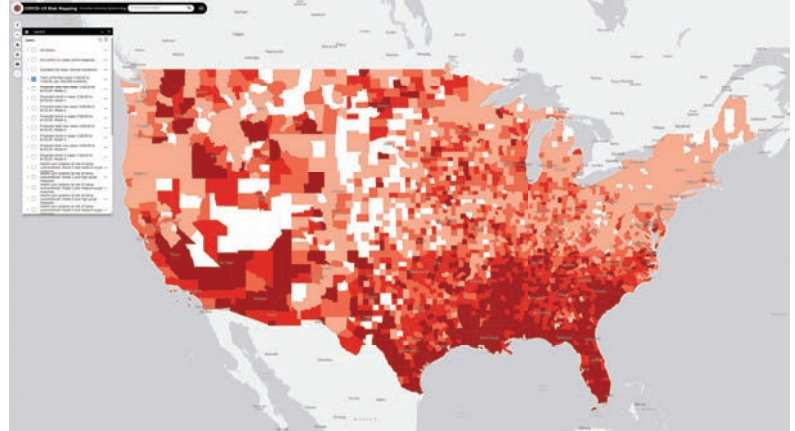
When Lipkin began his work, it took years to identify a virus. Now, it takes hours. He rose to prominence by using molecular methods to identify viruses, infecting rats with a disease and then subtracting the rats' DNA, leaving the virus. He developed MassTagPCR (polymerase chain reaction), which detects multiple viruses at once, and GreeneChip, a glass slide containing 500,000 genes that tests for known pathogens. He then pioneered the use of high

**Columbia Mailman School faculty are answering critical questions about COVID-19. A sample of their work:**





Lipkin (right) visited in China with Zhong Nanshan, MD, an epidemiologist and pulmonologist, who discovered the SARS coronavirus in 2003. Photograph: Cheng Guo



Andrew Rundle, MPH, DrPH, associate professor of Epidemiology, harnessed data from the U.S. Census Bureau, Medicare, and Medicaid, among other sources, to create interactive maps showing covid vulnerabilities at a county level.

throughput sequencing for pathogen surveillance and discovery. The tests, fast and cheap, are needed when pathogens travel thousands of miles in mere hours.

Earlier this year, after returning from China, Lipkin made television appearances, promoting isolation of patients, testing, and contact tracing, among other critical containment measures he had seen in China. Meanwhile, working in CII's high-security, pressurized Biosafety Level 3 laboratory, he and the CII team, including Nischay Mishra, PhD, an assistant professor in Epidemiology, developed an antibody test for SARS-CoV-2 as well as a PCR assay that can simultaneously detect influenza A, influenza B, and SARS-CoV-2 viruses. Generous donors stepped up to fund this work; at press time the School had raised \$10 million for COVID-19-related science.

Later in the spring, Lipkin and Mishra examined the therapeutic effects of convalescent plasma for COVID-19 in a study funded by a \$2.5 million award from Amazon. The U.S. Food and Drug Administration later authorized emergency use of plasma. The CII team is also studying the repurposing of previously approved drugs for COVID-19 treatment, investigating the appearance of multisystem inflammatory syndrome in children after COVID-19 infection, and examining the effect of ultraviolet light and other disinfectants.

While helping to stop one pandemic, CII is preparing for the next ones, planning a surveillance system, the Global Infectious Diseases and Epidemiology Network (GIDEON). With initial support from the Skoll Foundation, the network, which involves epidemiologists in

more than a dozen countries, is designed to equip scientists with biomolecular tools to quickly identify novel pathogens and to raise early alarms. "We're not done," says Lipkin. "This is not the last threat. It may not even be the worst."

### Predictions from the Past

While Lipkin and his team broke new ground in the lab, Jeffrey Shaman looked back, turning for insight to a groundbreaking study he had conducted before the crisis with the aim of advancing understanding of how disease is transmitted, even by seemingly healthy people, and improving experts' ability to forecast spread. From 2016 through 2018, during his Virome of Manhattan project, Shaman and his team tracked

Salim Abdool Karim, DSc, PhD, was appointed to the *Lancet* COVID-19 Commission to help speed up global solutions to the disease.

Sara Abiola, PhD, JD, is leading research exploring expanded access to Supplemental Nutrition Assistance Program benefits during the pandemic.



A CII team trains to use the new, more efficient Triplex SARS-CoV-2 rRT PCR assay developed by Nischay Mishra, PhD, assistant professor of Epidemiology. Photograph: Eileen Barroso

respiratory viruses throughout the borough by following 214 people. “Until the Virome project, we didn’t realize to what extent the rapid movement of a virus is fueled by undocumented infections. That project informed the way we thought about this coronavirus,” says Shaman.

Shaman and his team concluded by late February that “stealth transmission” by asymptomatic yet unidentified carriers was driving the spread of SARS-CoV-2, a headline-making turning point in understanding the virus. They determined that in China, a stunning 86 percent of early infections were not documented. “That’s what led to its rapid spread,” he says. “People who, because their symptoms are mild or non-existent, are out and about, going shopping, going to work or to school, and bringing the virus to new populations.”

Shaman and his team, including Sen Pei, PhD, associate research scientist in Environmental Health Sciences, then built models projecting the disease’s spread in the United States using data provided by *The New York Times*. Their calculations laid bare the destructive potential of the virus, and exposed the fact that had mitigation measures been used just one week earlier, 36,000 lives could have been saved. “We’re looking at something that’s catastrophic,” Shaman told the *Times*. They weren’t done, though. With support from the Morris-Singer Foundation, they accurately predicted a large resurgence of cases and deaths starting in June. Shaman advised policymakers across the U.S. and his models served as a foundation for data visualizations of critical care capacity developed by Charles Branas, PhD, chair of the Department of Epidemiology, and Andrew Rundle, MPH, DrPH, associate professor of Epidemiology.

Shaman continued to mine his earlier work for insight into reinfection, another pressing concern. His Virome project had found that 12 of 137 people who were infected with a coronavirus that causes the common cold were reinfected. That, Shaman says, was a signal to policymakers and others to proceed cautiously when considering whether those infected had immunity from SARS-CoV-2 and for how long. “It opens lots of questions,” he says, “for example, are repeat infections going to be milder, about the same, or worse?”

Later in the summer, as wildfires raged across California and hurricanes displaced

hundreds of thousands of Americans, Shaman examined the possible intersection between the pandemic and climate change. An expert in climate and disease, Shaman published projections on the potential spread of the novel coronavirus following an evacuation from a hurricane, which also has implications for evacuations from wildfires.

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### Helping Africa Face the Fight

Columbia Mailman School’s long history of fighting infectious diseases extends into the field worldwide. As news of the virus broke, Wafaa El-Sadr, MD, MPH ’91, MPA, the Dr. Mathilde Krim-amfAR Chair of Global Health, a professor of Epidemiology and Medicine, and the founder and director of ICAP, a global research and capacity-building center at Columbia Mailman School, was already focused on the world’s most under-resourced countries in Africa, Asia, and the Americas. ICAP quickly moved to assist national ministries of health in developing and implementing a response plan, while at the same time working on the ground to help health workers and health facilities prepare to address COVID-19.

El-Sadr brought decades of experience translating scientific best practices into reality in resource-limited environments. She led the Division of Infectious Diseases at Harlem Hospital Center in the early years of the AIDS epidemic, when support for patients with another mysterious disease

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Wendy Chavkin, MPH ’81, co-authored a report on global policies to address an expected second wave of COVID-19.

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Merlin Chowkwanyun, MPH, PhD, co-authored a *New England Journal of Medicine* article about racial disparities and COVID-19.

was hampered by limited resources, stigma, systemic discrimination, and community distrust of the medical establishment. In response, she launched community- and family-centered models for HIV and tuberculosis (TB) management. She remembers caring for a woman with HIV in Harlem who was reluctant to accept treatment and was deteriorating rapidly. Ironically, the patient was vigilant about taking care of her young child with HIV. “It made me realize that we needed a family-focused model of care. We started a clinic where she’d be seen at the same time as her child.”

El-Sadr was among the first to integrate research and care, in response to feedback from the community. That model became the precursor to groundbreaking interventions for HIV, and later TB and malaria and other public health priorities, that she and

her team initiated in sub-Saharan Africa. In 2003, El-Sadr founded ICAP, which now works in more than 30 countries. Its vision is centered on the following principles: true partnership with in-country leadership, as well as a focus on strengthening health systems and on building indigenous capacity. “We provide the technical assistance and support,” she says. “We’re not there to do the work for the people on the ground. The people we work with bring great ideas. They just need the support to do what they know needs to be done. We offer training and resources to enable them to move forward.”

That work earned El-Sadr a MacArthur “genius” grant, and it positioned ICAP to be ready to assist countries in responding to COVID-19. “When HIV spread like wildfire across the African continent, it took decades for the global community to mobilize a response,” says El-Sadr. “We certainly did not want such a delay in response to this new pandemic.” In a passionate *New England Journal of Medicine* Perspective article about COVID-19, she wrote, “Epidemics know no borders, and success in controlling the epidemic in any one country will be limited if epidemics continue to rage elsewhere.” Throughout the spring, El-Sadr and ICAP mobilized, supplying some form of COVID-19 support in 23 countries ranging from Angola to Zambia. ICAP helped to set up laboratories and isolation units, conducted surveys to assess the infection’s spread, procured personal protective equipment, trained frontline workers on infection prevention and COVID-19 diagnosis and

management, and pursued participation in vaccine development. Closer to home, El-Sadr also chaired the public health response group guiding Columbia University’s COVID-19 Task Force. More recently, ICAP launched a major study to understand the impact of COVID-19 on hard hit communities in New York City and on older adults in particular. El-Sadr worries that even though the infection may have lagged in reaching some countries, it is raging in others. “Global partnership and commitment are critical, combined with rapid action on the ground,” she says. “So much is at stake, which compels us to act now.”

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### How to “Think” Like a Pathogen

Barun Mathema, MPH, PhD ’11, assistant professor of Epidemiology, views risk through the eyes of the pathogen adapting to find a host, and explores how housing, and the design of a city and its transportation systems, can have an outsized effect on transmission. He quickly joined a study earlier this year to explore evolution and transmission of SARS-CoV-2 using data from a New Jersey hospital system. That work follows a path Mathema has blazed toward understanding the transmission of TB.

Since getting his PhD at Columbia Mailman School, Mathema has spent almost a decade researching the multiple dimensions of how TB transmission is influenced by culture, geography, and economics. His re-



ICAP helped construct handwashing stations in Kisumu, Kenya. Photograph: Joash Asiko

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Dean Linda P. Fried, MD, MPH, and others are undertaking a global survey on how people are coping, and the pandemic’s effect on loneliness.

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Diana Hernández, PhD, and Markus Hilpert, PhD, testified to the New York City Council on COVID-19 in communities of color.



El-Sadr on a field visit to Mazowe, Zimbabwe in November, 2015. Photograph: ICAP

search involves populations in New York and China, as well as in South Africa. “Transmission is really the interface between how people behave and how a bug can adapt in that environment, and I’ve always been interested in both aspects,” Mathema says. “How do infectious diseases originate and propagate? What drives epidemics? Who are the people who are really infecting people?” Pathogens like TB and COVID-19 are interwoven into society. Looking at their transmission raises major questions. “How do we design our cities to reduce transmission? Housing has a measurable impact on diseases, for example,” he says. Last year, Mathema published a study in *Proceedings of the National Academy of Sciences of the United States of America* that traced an outbreak of drug-resistant TB in a South African province, finding that the origins of the outbreak

had begun more than a decade before the outbreak surfaced. His work on TB informs his thinking on how COVID-19 spreads.

His long-term COVID-19 study is tracking the evolution of the virus and how that affects patient outcomes as vaccines and new drug therapies become available. As the virus encounters those barriers, it likely will evolve, he says. New techniques like high throughput sequencing and global sharing of data, things not readily available even as recently as the H1N1 pandemic in 2009, make his work possible.

The idea is to pick up a dangerous strain of the virus before it spreads and give public health leaders information so they can act. “One of our hard lessons with drug-resistant TB has been that we find out when the cat’s out of the bag,” he says. “That’s really difficult. The basic idea is to know earlier so we can prepare.”

## Predicting the Ebb and Flow of the Virus

For Micaela Martinez, PhD, an assistant professor in Environmental Health Sciences, the new coronavirus offered an opportunity to explore questions that she has delved into for several years, using cutting-edge statistical inference techniques and mathematical models. Martinez won a National Institutes of Health Director’s Early Independence Award to explore fluctuations in the body’s biological rhythms over the course of the seasons. In 2018, she published a calendar showing the seasonality of 69 infectious diseases. She also found that geography mattered. Syphilis thrived during winter in China, while gonorrhea peaks in summer and autumn in the United States. “I wasn’t expecting seasonality in things like herpesviruses, tuberculosis, HIV,” she says. “I was very struck by this.”

That led to her ongoing research project evaluating how immune systems change over a day as well as over a year. Each season, volunteers spend 24 hours at the University of Surrey, United Kingdom having their noses swabbed and blood sampled to check for 16 respiratory viruses. The pandemic interrupted the analysis of samples, but she reports that there are indications that the immune reactions of the body change with the seasons and even within a 24-hour cycle. The applications of this knowledge could include administering vaccines during a particular season and time of day to get the best protection possible.

Neetu John, PhD, co-authored an analysis suggesting that gender-based violence would increase during the COVID-19 pandemic.

Peter Muennig, MD, MPH '98, developed a cost-effectiveness model to assess the value of infection control measures at a school or business.

"Success in controlling the epidemic in one country will be limited if epidemics rage elsewhere."



Martinez working in the wet lab during her recent clinical study on seasonal immunity. Photograph: Sopita Janchang

Ultimately, those projects prepared Martinez to dive deep into the mysteries of the novel coronavirus, participating in a National Science Foundation-funded study examining its transmission and immunity, a key to understanding whether people could be reinfected, and creating a timeline of infection in New York to better understand transmission. Her team's first paper examined differences in disease related to neighborhood and race: The researchers found that Black New Yorkers were two times more likely to die of COVID-19 and Hispanics were 1.8 times more likely compared to whites. "In New York City, we were seeing quite early on that Queens and the Bronx were being hit harder, and we suspected health disparities played a role," Martinez says. The top three COVID-19 comorbidities—hypertension, diabetes, and obesity—were also more prev-

alent in the Bronx than in Lower Manhattan, for example. Martinez's work also brought to light inequities in testing that were potentially driven by race: Despite higher rates of infection in the Bronx and Queens, majority-white Staten Island had the highest rate of testing.

### Watching Predictions Play Out

It's hard to believe it in the midst of this pandemic, but a few decades ago, the concept of "emerging infectious diseases" didn't exist. Stephen Morse, PhD, a professor of Epidemiology and the director of the Infectious Disease Epidemiology Certificate Program, coined the term before a conference he chaired on emerging viruses at the National Institutes of Health in 1989. As far back as 1991, Morse warned that viral traffic was increasing. Today, he is in demand to educate the public about the emergence of SARS-CoV-2. In the early months of the pandemic, he and other faculty gave interviews on COVID-19 that appeared in more than 2,000 news articles worldwide.

In the intervening years, Morse became a trailblazer, building the foundation for research not only at Columbia Mailman School but also in laboratories around the world. In 1994 he was a founder and chair of ProMED, the Program for Monitoring Emerging Diseases, an innovative global surveillance effort. He wrote the lead article in the first issue of the new *Emerging Infectious Diseases* journal in 1995. In that paper, he pointed out that high-fatality zoonotic

viruses (those which jump from animals to people) would emerge as ecological changes and agricultural development placed people closer to animals. The evolution of known human viruses, he contended, was less important than the threat of viruses moving from animals to humans and from one location to another. Four decades ago, "focusing on this was a sort of a big leap into the unknown," he says. But in the years since, there has been one outbreak after another of zoonotic viruses: Ebola, SARS, MERS, Nipah, Zika ... the list goes on.

Morse recalls Anthony Lake, the national security advisor in the Clinton administration, saying he thought biological threats were national security threats. "A lot of people scoffed at that. I was not among them," he says. "We can see now how devastating something like this can be—the effect on the economy, on travel, on international relations. Maybe at least for a few years we'll start taking these infections seriously and make sure we have the resources and don't waste time." In the darkness of the COVID-19 pandemic, he takes comfort in this: Former students in his longstanding course on emerging infectious diseases are now working in labs, health departments, and agencies across the country, unraveling the mysteries of COVID-19 and looking beyond this pandemic, to predict the next one.

Jim Morrison writes about the environment, health, and other topics for Smithsonian, The New York Times, and The Washington Post.

Wan Yang, PhD, led research finding that the lockdown cut transmission of the virus by 70 percent in New York City.

Find a complete list of COVID-19 work at the School at [publichealth.columbia.edu/respondcovid19](http://publichealth.columbia.edu/respondcovid19)



# Frontiers in Food

Food is at the heart of issues that concern everyone in public health, from malnutrition to cancer, climate change to disaster response. Columbia Mailman School creates the science that puts food and health at the center, offering students unique opportunities to examine how we truly are what we eat, and to change our future for the better.

By Sharon Tregaskis



**B**ack in mid-March, when first-year MPH student Lauren Battle left Washington Heights to shelter in place at her parents' home in Cleveland, she thought she was doing what she could to protect the health of her community. Over the next three weeks, however, a more nuanced picture of vulnerability emerged: As coronavirus deaths and complications in the United States skyrocketed, communities of color and those in low-income neighborhoods were being hardest hit. The virus was exacting an especially high toll among those also afflicted with heart disease, diabetes, and high blood pressure—all of which can be linked to long-term dietary patterns and food insecurity. For Battle, the role of the United States' web of farmers, processors, distributors, retailers, and governing policies—its food system—in the health risks of fellow African Americans was hard to ignore.

Battle, a former congressional intern who is pursuing a Health Policy and Practice certificate and who aspires to a career combating physical and mental health inequities with policy solutions, heard a call to action within the pandemic trends. "I wanted to explore how food systems have contributed to and exacerbated those disproportionate outcomes in Black and Hispanic communities," she says. Battle found common purpose during a call with Sara Abiola, JD, PhD, an assistant professor of Health Policy and Management and co-founder of the Columbia Mailman School's

Better Health Systems Lab. "Societies with food systems characterized by greater consumption of more highly processed, calorie-dense, high-fat junk food have higher rates of noncommunicable diseases traced to dietary patterns," says Abiola, whose seven-country Global Food, Alcohol, and Tobacco (GFAT) Index compares national regulations intended to promote health. "The pandemic has highlighted that certain types of food systems—those associated with elevated levels of overweight and obesity—indicate that a society is at risk for poor health outcomes."

Abiola, Battle, and a small team of students worked together after the pandemic hit to create the Food Systems Justice Project, a research lab that studies how state-level laws, policies, and litigation can be used to create food systems that support consumption of healthier foods, reduce racial health disparities, and promote equity in food access and ownership. Their first project examined how New York state food policy councils defined and took action in relation to racial equity in food systems, and they continue to develop datasets and legal toolkits designed to aid those who are on the front lines promoting greater access to nutritious fare in minority communities. "The Project focuses on three major questions," says Abiola. "How do we best quantify the extent of state-level racial inequality in food access and ownership of means of food production? How do we use policy to eliminate these racial disparities? How do we use the legal system

"Societies with greater consumption of more highly processed food have higher rates of noncommunicable diseases."

# A Taste of the Food Curriculum

Popular courses explore how food is at the center of many critical public health issues.

**HPMN PB589: The Food Justice Movement: What Does it Mean for Public Health?** with Mark Bittman casts a close eye on the policies that promote healthy populations. Guest speakers—including food experts, labor advocates, scientists, members of the government, and journalists—explore the impact of health disparities, worker rights, and climate change on access to food.

**ENSC PB311: Basic and Applied Nutritional Sciences** examines the connection among basic research, applied research, and programs and policy decisions related to nutrition. Mary Gamble, PhD, uses a case-study approach to examine hotly debated nutritional issues.

**SOSC PB750: Confronting Obesity: Society, Structures, and Policy** provides an overview of the sociocultural factors associated with the obesity epidemic. Gretchen Van Wye, PhD, has students identify promising strategies for intervention and assess multipronged solutions to this multifactorial problem.

to change the behaviors of food and beverage manufacturers that contribute to unhealthy food consumption patterns?”

Across Columbia Mailman School, faculty conduct research on how income inequality, the global economy, climate change, health policy and other policies such as agricultural policy, affect what we eat and how we live. They also explore how the food system has changed in recent decades. Scholarship on the role of the food system in public health runs broad and deep. In Environmental Health Sciences, plant physiologist and associate professor Lewis Ziska, PhD, investigates how climate change affects the nutritional profile of staple food crops—his latest publication documents reduced caffeine levels in coffee as carbon dioxide levels rise with global warming—and analyzes how changing weather patterns affect weed pollen. His colleague, associate professor Mary Gamble, PhD '99, studies how a person's nutritional status affects their susceptibility to arsenic toxicity and the efficacy of treatment in Bangladesh. In Epidemiology, associate professor Jeanine Genkinger, PhD, investigates the role of nutrition in the detection and treatment of rare and highly fatal cancers.

For MPH students, that scholarship translates into courses in the human microbiome, implementation science, food insecurity, social justice in the food system, and more. Students also have myriad opportunities to pursue practical experience—like Battle's collaboration with Abiola, and a wealth of projects assigned as part of formal coursework. In addition, the School's Food

Fellows program selects 10 current students to participate in practica in food systems policy development; planning, implementation, and evaluation; data collection and analysis; community assessment; communications with community partners; local media engagement and advocacy; and policy review—all while building relationships with key partners and future employers.

As the School's special advisor for Food Policy, best-selling cookbook author Mark Bittman catalyzed the program's formation. A fellow in the Food and Environment program of the Union of Concerned Scientists and a former *New York Times* columnist whose book *How to Eat* was published in March, Bittman has hosted a food justice and public health lecture series and teaches a course called The Food Justice Movement: What Does It Mean for Public Health? “I have several roles here, but chief among them is to campaign to recognize the importance of food issues beyond nutrition in the public health arena,” he says.

Case in point: In November 2019, Dean Linda P. Fried, MD, MPH, hosted and moderated Redefining Nutrition: Food in the Era of Climate Crisis, a panel discussion featuring Abiola, Bittman, and Ziska. During the conversation, Fried invited each of the panelists to imagine a solution for a problem of the food system on which they focus. Ziska, who has contributed to several reports by the United Nations Intergovernmental Panel on Climate Change, proposed a grocery labeling system, akin to the U.S. Department of Agriculture's organic certification, to inform consumers about the nutritional value and







“Food nourishes more than our bodies—it feeds our spirit.”

climate change impact of a given product. Accelerated MPH student Sining Zhou (’20) was hooked. “I was a technology consultant and product designer in health-care before coming to grad school,” she says. “I reached out to him, thinking, *What can we do to make this possible?*” Today, Zhou and Ziska are seeking funding for Carbon Foodprint, an environmental health and behavioral science project that brings to life Ziska’s dream. It’s a food labeling system combining a carbon footprint calculation with behavioral tests to reveal whether targeted labeling nudges consumers toward more ecologically friendly and healthier food choices. Abiola and Kai Ruggeri, PhD, assistant professor of Health Policy and Management, consulted on the project.

Food nourishes more than our bodies—it feeds our spirit. We invite a special someone to a family dinner, deliver caseroles to mark births and deaths, and pass down recipes across generations. That synergy of body and spirit sparked the imagination of Sandra Albrecht, MPH ’04, PhD, when, as a graduate student in Social Epidemiology, she first learned of the immigrant paradox. In brief: Despite their experience of racism in the U.S., as well as their typically lower income and educational attainment, recent immigrants exhibit better health than native-born Americans. The longer they—and future generations—live in the U.S., however, the more their health profile suffers.

Growing up in the ’80s, Albrecht learned Spanish before English and savored the flavors of her mother’s Ecuador-

ian homeland. In their Queens kitchen, fresh seafood became citrus-sparked ceviche, yuca flour became sweet pan de almidon, and potatoes were transformed into llapingacho patties. For this social scientist, the immigrant paradox posed more than a philosophical curiosity—it was personal.

Now an assistant professor of Epidemiology, Albrecht has spent the past decade analyzing datasets, trying to understand how the paradox works and sorting out what factors protect against the metabolic disorders of depression, diabetes, heart disease, and high blood pressure among new Americans. She’s investigated how neighborhood ethnic composition affects the diet, physical activity, and health measures of residents; analyzed the role of parenting practices in the diets consumed by Hispanic children in the U.S., and teased out the relative power of immigrant enclaves to buffer depressive symptoms among residents. This spring, she received a junior faculty grant from Columbia’s Office of the Provost to explore how living in an ethnic enclave in the U.S. affects the diet quality and choices of a large sample of Hispanic and Latino adults from diverse cultures of origin. “There’s enormous variation in language, culture, and how people eat,” says Albrecht. “What makes one group experience poor health and another does not?”

Writer Sharon Tregaskis is the former editor of Columbia Public Health. She raises an assortment of vegetables on a small farm in New York’s Finger Lakes region.

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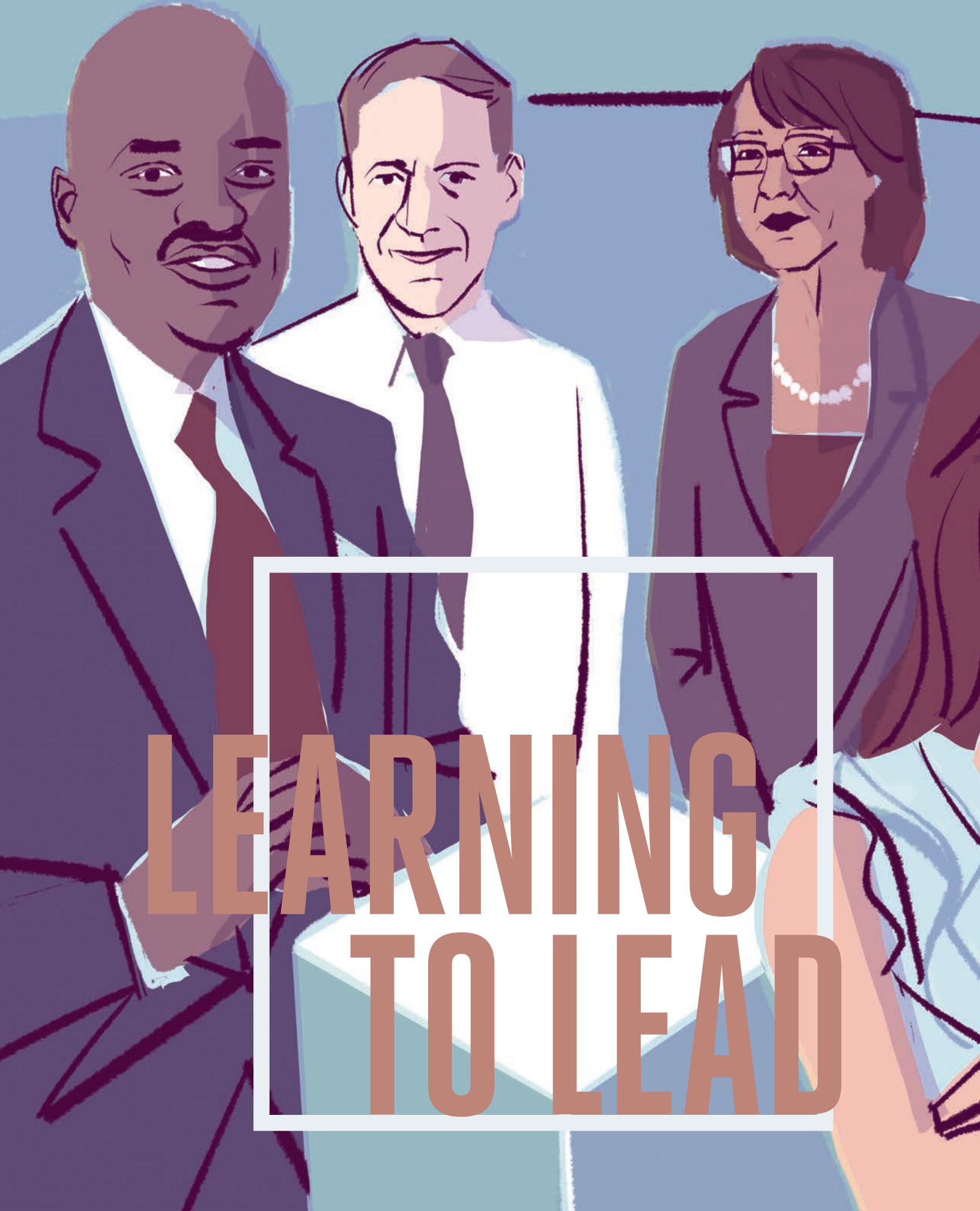
**POPF P8648: Food and Nutrition in Complex Emergencies** with Jeanette Bailey, MSc, PhD, and Casie Tesfai, MSc, leverages real-life scenarios and examples in which students learn how to develop and deploy nutrition program assessments in emergencies, among populations that are often already undernourished.

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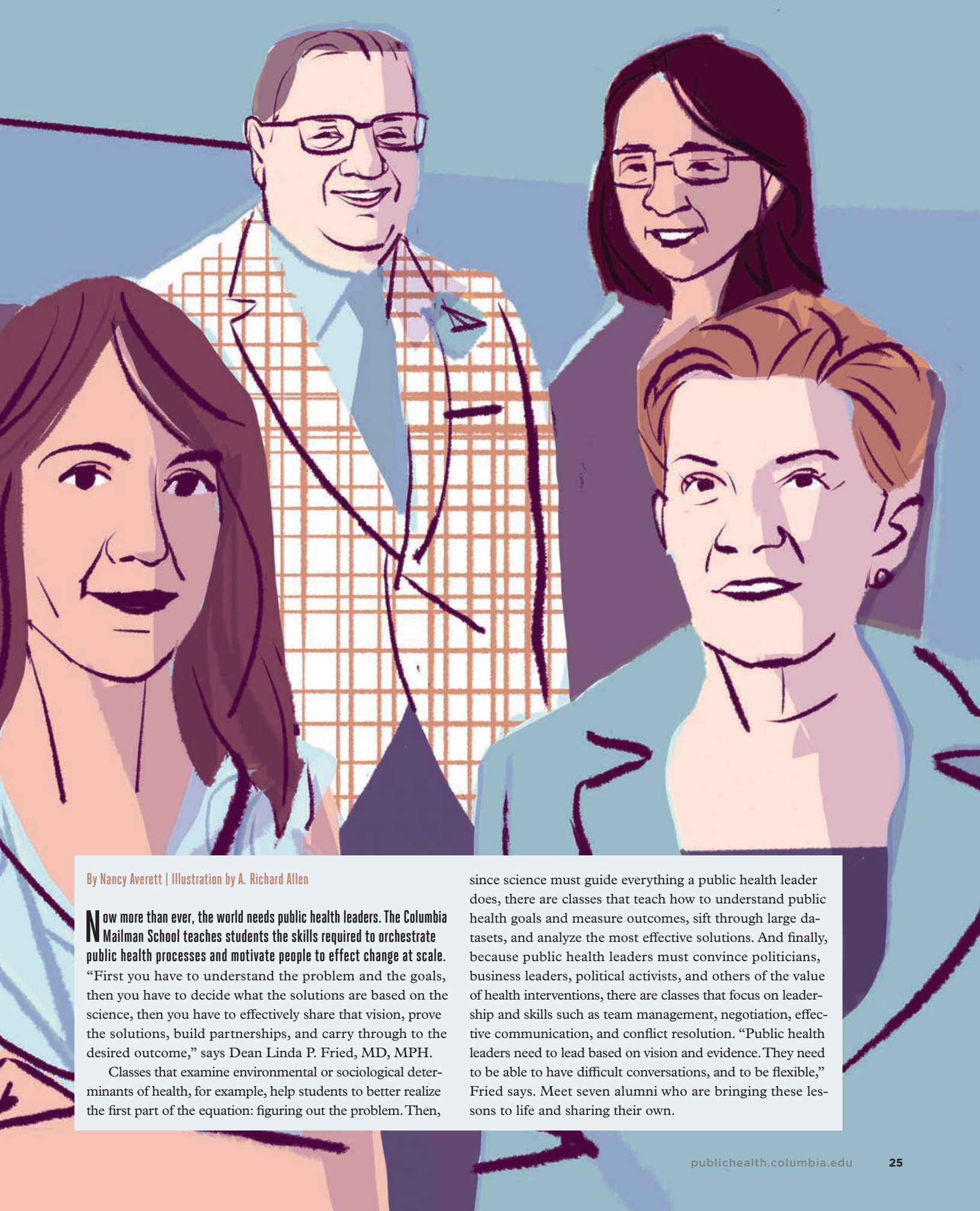
**EPID P8403: Nutritional Epidemiology**, taught by Sandra Albrecht, MPH, PhD, explores the methods involved in determining the role of nutrition in the causes of various disease states.

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**SOSC P8792: Dissemination and Implementation Science** examines the gap between knowledge and behavior. Rachel Shelton, ScD, MPH, helps students eliminate this gap and facilitate the successful dissemination, implementation, and sustainability of evidence-based practices.



**LEARNING  
TO LEAD**



By Nancy Averett | Illustration by A. Richard Allen

**N**ow more than ever, the world needs public health leaders. The Columbia Mailman School teaches students the skills required to orchestrate public health processes and motivate people to effect change at scale.

“First you have to understand the problem and the goals, then you have to decide what the solutions are based on the science, then you have to effectively share that vision, prove the solutions, build partnerships, and carry through to the desired outcome,” says Dean Linda P. Fried, MD, MPH.

Classes that examine environmental or sociological determinants of health, for example, help students to better realize the first part of the equation: figuring out the problem. Then,

since science must guide everything a public health leader does, there are classes that teach how to understand public health goals and measure outcomes, sift through large datasets, and analyze the most effective solutions. And finally, because public health leaders must convince politicians, business leaders, political activists, and others of the value of health interventions, there are classes that focus on leadership and skills such as team management, negotiation, effective communication, and conflict resolution. “Public health leaders need to lead based on vision and evidence. They need to be able to have difficult conversations, and to be flexible,” Fried says. Meet seven alumni who are bringing these lessons to life and sharing their own.

LEADERSHIP LESSON:  
**WORK BACKWARD  
FOR RESULTS**



**Amina Evangelista Swanepoel, MIA/MPH '08**, studied program planning with Linda Cushman, PhD, professor of Population and Family Health, and says that knowledge has been invaluable in helping her start an organization that provides reproductive health classes and contraception in the Philippines. “It’s basically starting at the end, thinking about what impact you want to have, and working your way back,” she says of Cushman’s prescription for effective planning.

Swanepoel hadn’t envisioned immediately returning to the country where she grew up (her father is Filipino, and her mother is American). But after she graduated, her mother, a professor at Palawan State University, called. Her mother said that her students were having unplanned pregnancies—would Swanepoel and her husband, a teacher, consider moving to Palawan to help her start a program to educate them about sexual and reproductive health? In 2009, the three founded Roots of Health and began teaching classes at the university. Eight months later, they expanded to local high schools and hired nurses to distribute contraceptives. Then in 2017, Swanepoel, as Roots of Health’s executive director, expanded its scope. “Even at the height of what we were doing on our own, we were reaching only several thousand women,” she says. “To bring population-level change, we had to get the government on board.” Roots of Health now lobbies officials to get them to spend more on the prevention of HIV and unplanned pregnancy.

To make sure she’s on track with Roots of Health’s objectives, Swanepoel regularly conducts pre- and post-intervention surveys with stakeholders. Cushman taught her the importance of carefully worded survey questions; the professor would throw out an exam question if more than 20 percent of students got it wrong, reasoning that it wasn’t worded correctly. Funders are amazed that her organization puts so much effort into monitoring and evaluating impact because for many nonprofits that can be an afterthought. “When they ask me how we knew that monitoring and evaluation was so important, I always say, ‘Because I went to public health school.’”

LEADERSHIP LESSON:  
**EXAMINE THE  
OPPOSITION**



A Columbia Mailman School class on outbreak investigations taught by a former disease detective with the U.S. Centers for Disease Control and Prevention (CDC) Epidemic Intelligence Service (EIS) motivated **Tom Frieden, MD/MPH '86**, to successfully apply for a job with the EIS after he graduated. This set him off on a decadeslong path in public health, including stints as New York City health commissioner and director of the CDC. Along the way, he led responses to a multi-drug-resistant tuberculosis epidemic in New York City and the 2014–2016 U.S. Ebola outbreak.

Looking back on those high-profile jobs, Frieden says he’s learned that public health leaders need communication and negotiation skills as well as an awareness of influences that can determine the public’s acceptance of the science. “Public health officials can be naive about politics,” says Frieden, who is now president and CEO of the nonprofit Resolve to Save Lives, an initiative of Vital Strategies, which focuses on curbing cardiovascular disease and preventing epidemics worldwide. “We seem to think that if we just say what needs to be done, it’ll happen. But you have to analyze why things are not happening and think about what political and economic forces are at play, and where there is leverage where you can make a difference to save lives.” The importance of understanding politics and communication was apparent during the COVID-19 pandemic. When the Trump administration silenced CDC leaders, Frieden helped fill the void, testifying before the U.S. House of Representatives to urge increased funding for coronavirus testing and contact tracing. He gave hundreds of media interviews and wrote dozens of opinion pieces. He is hopeful that, if nothing else, the pandemic will show the importance of public health: “If this isn’t a teachable moment, there never will be one,” he says.

LEADERSHIP LESSON:  
**LISTEN TO YOUR  
TARGET AUDIENCE**



When she enrolled part time at Columbia Mailman School, **Donna Lynne, MPA, DrPH '03**, was director of the New York City Mayor's Office of Operations and senior vice president of the New York City Health + Hospitals Corporation. For most of her professional life, she had worked on the business side of healthcare. At Columbia Mailman School, she immersed herself in the human side, taking classes in Sociomedical Sciences, Epidemiology, and Environmental Health Sciences. "It really was eye-opening," she says. Under the mentorship of Jeanne Stellman, PhD, professor emerita of Health Policy and Management, Lynne wrote her dissertation on how upfront interventions with people who had Type 2 diabetes resulted in fewer ER visits and better disease management. What was even more interesting to Lynne, though, was that patients surveyed said they were happier with their healthcare and felt healthier. "They said, 'I'm feeling better. I think I can go back to work,'" she says.

With the knowledge that patient satisfaction is key, Lynne earned her degree and went on to serve as president of the Kaiser Foundation Health Plan of Colorado, then as the state's lieutenant governor. Lynne embarked on a listening tour in all 64 counties and created a program for residents to give customer-service feedback to the governor's office. She heard that Internet access and healthcare costs were top concerns, so during her tenure the state increased spending on broadband coverage and passed a bill that averted more than \$500 million in cuts to the state's hospitals.

In January 2019, Lynne became senior vice president and chief operating officer of Columbia University Irving Medical Center, and chief executive officer of Columbia Doctors in New York City. During the early days of the pandemic, she had to temporarily redeploy hundreds of medical center workers to new positions where their skills were badly needed, such as having dental hygienists perform X-rays of infected patients. A few months later, as the hospitals returned to a more normal routine, she sent the staff a survey on transportation and child care, then used the data to expand child care and transportation options. "Thinking back to my dissertation, it wasn't just about reducing claim costs but about finding out if people actually felt healthier," she says. "I think subjective information can be powerful when paired with objective data."

LEADERSHIP LESSON:  
**DEVELOP  
SOFT SKILLS**



Transitioning from an organization with a top-down hierarchy to one with more decentralized authority has been an adjustment for **Edward Bobb, MPH '18**, who spent 23 years with the New York City Fire Department before becoming assistant commissioner in the Division of Emergency Preparedness and Response at the New York City Department of Health and Mental Hygiene in 2019. "You're trained as you move up in the ranks in the fire department that when you say, 'Do X, Y, and Z,' then X, Y, and Z is done," he says. That is not necessarily so in his new post. "When you say, 'Do X, Y, and Z,' people say, 'Well, maybe we should do A, B, and C.'"

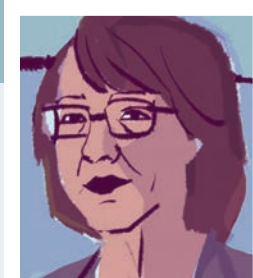
Fortunately, Bobb got some practice in the soft skills needed to work in an atmosphere where sharing diverse viewpoints is common when he got his Executive MPH at Columbia Mailman School. As with all students, he spent the majority of his time interacting with a specific cohort of fellow students and practicing listening and negotiating, remaining flexible, and keeping an open mind.

Toward the end of the program, Bobb's cohort performed a simulation that recreated the experience of running a hospital with staffing struggles and financial issues. They considered population demographics, what other hospitals in the region were doing, and which departments they might have to close and which they might augment with more resources. As many group projects do, the simulation caused some disagreements. "At times we had to work at managing egos and a variety of personalities," Bobb says.

This type of nuanced communication is something he now relies on while helping to run the health department's emergency response system. Bobb had just seven weeks between when he was hired and when the system was activated due to COVID-19 to figure out the health department's culture, politics, and personalities so he could lead effectively. He says the experiences he had with his MPH cohort helped immensely. "The program at Columbia helped me to adjust my mindset, my perspective, a lot quicker than if I hadn't experienced those things with the cohort," he says. "Making a transition from the fire department to the health department would have been so much more challenging for me without that."

LEADERSHIP LESSON:

## FIGHT FOR POLICIES YOU BELIEVE IN



**Hedia Belhadj, MD, MPH '00**, was deep into a career in international public health when she decided to get her master's degree at Columbia Mailman School. The native Tunisian was in her early 40s, had a medical degree from Tunis University, and had spent years working to bring reproductive healthcare to places like Yemen and Djibouti. Then she moved to New York City to work for the United Nations Population Fund and began taking evening classes at Columbia Mailman School to bolster her public health knowledge. Eventually, Belhadj decided to get a master's degree. Through her job at the UN, Belhadj had already met and worked with the late Allan Rosenfield, MD, Columbia Mailman School's dean from 1986 to 2008. The two shared a passion for women's reproductive health.

During her public health law and policy classes, Belhadj was surprised to learn how much power state governments have over health laws in the United States, especially to place limits on abortion access. "I didn't have that part of public health, which is economics, which is policy, which is law. That's what I found with Columbia," she says. Today, she is president of Groupe Tawhida Ben Cheikh, a Tunisian nonprofit that fights to protect abortion rights. Women have long had the right to abortion in Tunisia, but after the 2011 Arab Spring, fundamentalists in the national legislature threatened to criminalize the procedure. To combat that, her organization surveys midwives and other frontline reproductive health professionals to see what kind of obstacles they are facing and lobbies ministers in Tunisia's government. "It's over our dead body," she says of any policies hoping to do away with abortion.

LEADERSHIP LESSON:  
**ALWAYS CONSIDER  
THE CONTEXT**



When he arrived in Washington Heights in the late 1990s, **Brian Castrucci, DrPH, MA '06**, discovered there were no full-service grocery stores in the area. It wasn't easy to cook without easy access to fresh, affordable food, but it did give him a taste of what daily life is like for many of the people he helps today as president and CEO of the Bethesda, Maryland-based de Beaumont Foundation, which promotes community health in impoverished areas. "You can only make a choice to eat healthy if there's a healthy option," he says.

One of Castrucci's inspirational professors was Jack Elinson, PhD, who founded Columbia Mailman School's Department of Sociomedical Sciences (SMS) in 1968 (it was the first such department in the nation). Elinson believed in looking beyond a community's health to scrutinize its surroundings and other factors. Castrucci took that to heart. Earning a master's degree in SMS prepares students to look at public health "not just through a health lens," he says, "but through a health lens and a sociological lens, or through a health lens and a political lens. Because health is rarely understood, if it's not contextualized."

Those lessons are reflected in the work Castrucci does, which focuses on leading his organization to start programs like CityHealth, which rates the country's 40 largest cities in nine policy areas and awards gold, silver, and bronze medals. Castrucci says that CityHealth has contributed to 59 policy improvements since the program's initial assessment in 2017. None involve delivering healthcare. Instead, they focus on things like affordable housing, smoke-free indoor air, and healthy food procurement. This particular way of thinking about health, which Elinson envisioned over 50 years ago, is still a bit radical to some. "Policy is a much stronger determinant of your health than pills," says Castrucci. "That's a pretty progressive way of thinking even now. Columbia was really ahead of the curve."

## Creating Tomorrow's Leaders

The pandemic has made it ever more apparent that the world needs public health graduates. But where will they work? “There really are more than 101 careers in public health,” says Heather Krasna, assistant dean of Career Services at Columbia Mailman School. She should know, as in her 22 years as a career counselor she has sent students into every imaginable area of the field. She is also co-author of the latest edition of the book *101+ Careers in Public Health*, out this fall. “Biostats is the hottest market now,” Krasna says. “Climate science is another growing sector.” In a study published earlier this year in the *International Journal of Environmental Research and Public Health*, Krasna noted that 91.7 percent of prospective employers believe the need for training in climate change will grow in the next five to ten years. “I think we are going to be ahead of that need as a school,” she adds. “There will also be a tremendous need for new hires in government, as a generation of leaders retires.”

Regardless of where students land, Krasna believes there is a common need for emotional intelligence. “If you are going to communicate an important public health message, you need the ability to have empathy for people, to take others’ perspectives; if you need to lead a team or build a coalition, you need that.” Columbia Mailman School trains its MPH students on leadership, and its practicum placements help students hone these skills and learn how to negotiate, to be persuasive, and to understand what others have at stake. Self-management, discipline, and time management also evolve in this real-world setting. “It’s a lifelong journey to develop these skills,” Krasna observes, “but we are planting the seeds of leadership.”

### LEADERSHIP LESSON: REACH OUT TO THE NEXT GENERATION



While working as a research assistant for then-Columbia Mailman School professor Eva Petkova, PhD, at the New York State Psychiatric Institute, **Julie Ma, PhD '01**, learned to design and run clinical trials and to analyze data using the statistical software R. “Working with her on those projects, I felt like I really understood the concepts of statistics,” Ma recalls. Petkova also demonstrated how to explain the data to physicians involved in the clinical trials, then gave Ma the independence to communicate directly with them, a skill that she would use frequently in her career.

After graduation, Ma worked at a series of pharmaceutical companies. She recently joined Assembly Biosciences in South San Francisco as a vice president of biometrics; there she focuses on the development of drugs for hepatitis B. In her previous role, at Gilead Sciences, she used her statistical acumen to help the company earn a U.S. Food and Drug Administration breakthrough therapy designation for Sovaldi, the first drug to cure hepatitis C. In each new role, she guides her team to be more efficient and to avoid errors that she made as a younger biostatistician. She lets them interact independently with physicians on the drug trials they run, and just as Petkova stepped in to walk her through difficult problems, she does the same for her staff. “My professors at Columbia generously gave me this knowledge and advice,” she says. “I would like to follow them as an example and give back to these younger researchers.”

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*Science writer Nancy Averett lives in Cincinnati. Her work has appeared in Discover, Audubon, Sierra, Pacific Standard, and Scientific American.*

# THE CANNABIS COMEBACK

The number of marijuana users has more than doubled in the past decade as legalization has spread across the United States. With the trend come a host of public health considerations, and Columbia Mailman School researchers are at the heart of the discussion.

By Alla Katsnelson

The last session on the last day of any scientific conference is always quiet, and professor of Epidemiology (in Psychiatry) Deborah Hasin, PhD, was anticipating a sparse crowd when she took the podium at an American Psychiatric Association meeting in May, 2010. To her astonishment, the room was packed, and at the conclusion of her presentation on marijuana dependence, the attendees asked a seemingly endless stream of questions. “We could barely get people out of the room,” Hasin recalls.

Many of the questions were about the new laws legalizing marijuana use that were sweeping the nation, and what their effect might be on usage of the drug. By 2010, 13 states had enacted laws that allowed citizens to use marijuana—or more specifically the leaf of the cannabis plant, or extracts thereof—for medical purposes. A few had passed further legislation to allow recreational marijuana use as well.

Since then, medical marijuana has been legalized in 33 states and Washington, D.C.; recreational marijuana is now legal in 11. At press time, a bill to decriminalize marijuana at the federal level was gaining momentum in Congress. And more Columbia Mailman School researchers, including Pia M. Mauro, PhD, assistant professor of Epidemiology, and Silvia Martins, MD, PhD, associate professor of Epidemiology, have published extensively on the public health impacts of marijuana use, and become among the foremost experts on the subject.







Today's marijuana is not the pot that previous generations smoked: The products widely available now are tremendously more potent. Many have a concentration of THC (tetrahydrocannabinol, the active ingredient in cannabis plants) of 20 percent or more, compared to 3 percent two decades ago. And while smoking remains a popular way of ingesting the drug, other, higher-potency modes of consumption such as edibles, vaping, and dabbing—inhaling vapor—are gaining ground. Although the substance remains illegal under federal law, public opinion has largely shifted to support legalization, and with the \$17 billion (and swiftly growing) cannabis industry pushing for it, the trend is almost certain to continue. “At this point, the question is not whether remaining states are going to be enacting these laws, but when,” says Mauro.

Epidemiologists are only beginning to understand the effect of state legalization laws and other cannabis-related policy measures on public health—not just on marijuana use, but also on downstream consequences, such as how people who use cannabis interact with the criminal legal system, or whether people who use cannabis are also more likely to use other drugs, including alcohol. “Unfortunately, policies are too often enacted with little or no consideration of the public health effects,” says Mauro. As she and her colleagues have contributed to building that knowledge base, presenting their work through the media or directly to policymakers, states can rely on it to craft policies that mitigate the risks that marijuana can pose—and to reshape legalization laws as well.

When Hasin started looking at the public health effects of state marijuana policies, she quickly noticed that rates of cannabis use were higher in states that had adopted medical marijuana laws. Researchers now know that the effect is causative, not coincidence. A major concern at the time was whether these laws would increase usage in teens, who are especially at risk of mental health issues as well as cognitive and motivational problems from the drug. Contrary to their expectations, Hasin and her colleagues found that in states where marijuana was legal in some form, teens across different age groups didn't use the substance more frequently—and in fact eighth graders seemed to use it less. Subsequent studies, by Hasin and others, have supported this conclusion. “Most of the data haven't shown a huge increase in adolescent use after the passage of legislation allowing both medical and recreational use,” says Martins, who is also director of the Substance Abuse Epidemiology Unit.

In general, studies show that legalizing *medical* marijuana does not seem to boost the prevalence of recreational use of the drug. However, what's becoming increasingly clear is that states that pass recreational



**Then: JOINTS**  
**Now: VAPE PENS**

Instead of rolling leaves into messy cigarettes, many users are now inhaling heated oil containing THC from a vaporizing device, whether an e-cigarette or an actual vaporizer. Unfortunately, this still carries health risks, including exposure to lung-damaging vitamin E acetate.





**Then: MARIJUANA, MARY JANE, MJ, DOPE, GRASS, POT**  
**Now: CBD**

Marijuana is still around, but cannabidiol (CBD), a compound found in the flower of the cannabis plant, is also being extracted and blended into oils and other compounds for its purported medicinal properties. Unlike marijuana, CBD does not produce a “high.”

cannabis laws do see a significant uptick in cannabis use disorder among adults—as well as a small bump in cannabis use disorder among teens who were already using the drug. That finding came through loud and clear in a study of about 500,000 people published in *JAMA Psychiatry* last year by Martins and colleagues. Frequent use (defined in the study as more than 20 days out of a month) increased too, as did the number of people who were classified as having cannabis use disorder (the use of marijuana despite clinically significant impairment of psychological, physical, or social functioning). The pandemic has added an extra layer of urgency to cannabis research: The latest Global Drug Survey, an annual study of drug-use trends, which polls some 55,000 people in 11 countries, found that almost two in five people had increased their use of cannabis since the start of the pandemic. Many cited stress and depression as reasons underlying their increased use.

Martins’ findings suggest that states that allow recreational use must also expand access to drug treatment. Arrests for marijuana possession have long been a manifestation of racial bias in policing, and one major argument in favor of legalization is that it decreases contacts with the criminal justice system in communities of color. On top of this social justice argument, proponents say that the marijuana market can also generate jobs and tax revenue for local communities. “But there are always tensions between these benefits and public health issues,” Hasin says.

In research that Mauro and colleagues published online in the *Journal of Studies on Alcohol and Drugs*, “We found significant increases in daily cannabis use across adult age categories after 2007,” she says. “This could be due to increasingly permissive cannabis legislation and lower risk perception.” This and other data are worrying. National data show that the number of people in the U.S. who use marijuana daily has doubled to about 8 million between 2008 and 2018, according to Guohua Li, DrPH, MD, Finster Professor of Epidemiology and Anesthesiology and the founding director of the Center for Injury Epidemiology and Prevention. “That’s a pretty troubling sign because daily use is a strong indicator of dependence,” says Li.

Over the past few years, Li’s team has demonstrated that marijuana use, especially in combination with alcohol, is associated with a marked increase in the risk of fatal car crashes. Meanwhile, studies consistently show that daily marijuana users have a heightened risk of mental health issues such as psychosis, and recent work he has done with his colleagues suggests that frequent use is tied to an increased risk of being charged with a felony.

Designing and implementing legalization thoughtfully could help stem its negative effects. Columbia



**Then: SMOKE SOME WEED**  
**Now: DAB SOME SHATTER**

Shatter, a translucent, extremely potent cannabis concentrate that looks and breaks like glass, is usually vaporized (“dabbed”) from a vape pen or water pipe.



**Then: POT BROWNIES**

**Now: COMMERCIALLY MADE EDIBLES**

Crafty cooks may have mixed marijuana leaves directly into brownie mix in years past, with widely ranging hallucinogenic effects. But today purchasers can choose from everything from gummy candies to granola to bottled margaritas with finely calibrated premeasured doses of THC. Either way the advice on ingesting is the same: “Start low and go slow.”



Mailman School researchers are now working to further understand how recreational or medical legalization laws, which vary widely state to state, influence health outcomes. For example, what is the impact when states have robust prevention programs—particularly for teens—as well as treatment programs? How do the potency and types of marijuana products the state allows affect health outcomes? As cannabis becomes big business, it is critical to look for “ways to legalize marijuana and still protect the most vulnerable,” says Martins.

Hasin, meanwhile, is exploring how marijuana use interfaces with the risk of COVID-19—for example, whether users have a higher risk of infection, and whether stay-at-home orders have contributed to an increase in use. She is also trying to pin down whether people who suffer from chronic pain or psychiatric conditions such as depression or post-traumatic stress disorder might be more at risk of increasing their marijuana use to unhealthy levels in response to changes in state laws. Earlier this year, Renee Goodwin, PhD, MPH '03, adjunct associate professor in the Department of Epidemiology, published research showing that pregnant women with depression are more than three times more likely to use cannabis than those without depression. Pregnant teens were especially vulnerable. “Our findings are timely, given rapidly shifting perceptions about risks associated with cannabis use and its legalization,” Goodwin noted.

Mauro is looking at whether state legalization laws may change how people who frequently use the drug interact with the criminal legal system and how easily they are able to access treatment. For example, she explains, if someone is less likely to be arrested for possessing marijuana, they may also be less likely to be referred to treatment as a consequence of the arrest. “It’s not entirely clear whether these treatment episodes were unnecessary to begin with, or whether we are reducing the ways people get into treatment. The question is, how do we create a system that doesn’t rely on the criminal legal system to access health services?” Mauro says. These things are hard to parse, she acknowledges, but that is one of the powerful aspects of this work. “We try to isolate effects that are very much intertwined—and what I love about public health is that we acknowledge that complexity.”

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*Alla Katsnelson’s work has appeared in Chemical & Engineering News, BBC Science Focus Magazine, The New York Times and other publications. She has a PhD in mammalian brain development.*

**Then: DEALER**

**Now: DISPENSARY**

State-regulated storefronts or offices where buyers can purchase cannabis products, either for medicinal or recreational use depending on local law, have sprung up across the United States.





# PUBLIC HEALTH IN PRISON

**Mass incarceration, rooted in systemic racism, has been called the most pressing civil rights issue of our day. A growing body of evidence shows that incarceration drives further inequities in the health not only of prisoners, but of their families and their communities as well.**

By Alexander Gelfand

Seth Prins, MPH, PhD, assistant professor of Epidemiology and Sociomedical Sciences and a Columbia Mailman School alumnus, believes that you can only see how a system truly operates when it is under pressure. Now, as jails and prisons across the country grapple with the pandemic, the pressure is on; and members of the Columbia Mailman School community involved in carceral health are getting a once-in-a-lifetime look at the extreme public health challenges faced by those affected by mass incarceration.

Columbia Mailman School has long worked to address issues surrounding incarceration's risks and outcomes. In 2014, with support from the Tow Foundation, the School hosted leaders from more than 50 schools of public health for a conference titled *A Public Health Approach to Incarceration: Opportunities for Action*. The following year,

Mark Hatzenbuehler, PhD, associate professor of Sociomedical Sciences, published a study in the *American Journal of Public Health* showing that living in a community with high rates of incarceration is bad for the mental health of all residents regardless of whether or not they spent time in the correctional system.

Yet the pandemic has focused public attention on carceral health to an extent never before seen. The numbers are deeply concerning: According to data collected by the Legal Aid Society, the rate of coronavirus infections in New York City jails in early May was approximately 4.5 times higher than the rate in New York City generally. Across the country, mini-epidemics have broken out in correctional facilities. In June, the five largest known clusters of COVID-19 were not in nursing homes but

in prisons. By September, The Marshall Project reported that there were at least 132,677 confirmed cases among prisoners.

Columbia Mailman School alumna Ellie Epstein (MPH '18; Sociomedical Sciences) is seeing firsthand how "the pandemic is exacerbating and revealing tensions and challenges that already existed." Epstein is director of Reentry and Transition Services at the Correctional Health Services (CHS), a division of New York City Health + Hospitals system that provides medical, mental health, substance use, and reentry support services to individuals in the city's jails.

A vast body of research, much of it summarized in a recent special supplement to the *American Journal of Public Health* co-edited by Robert Füllilove, EdD, associate dean for Community and Minority Af-

fairs, documents the health inequalities that confront justice-involved populations, which tend to be disproportionately comprised of already marginalized groups. The challenges range from lack of access to quality healthcare to higher rates of infectious disease, mental illness, and substance abuse. "Any situation that renders a population vulnerable socially also renders it vulnerable from a public health standpoint," Füllilove says. Yet the health effects of mass incarceration are not limited to those who are caught up in the carceral state; there are collateral effects in the general population as well.

COVID-19 has raised the stakes by introducing a highly transmissible disease into crowded jails and prisons. But the conditions that imperil the health of those who are incar-

**2.2M** More than 2.2 million people were in jail or prison in 2018, a sixfold increase since the 1970s.  
Sentencingproject.org

**4.5M** An additional 4.5 million individuals are on parole or on probation.  
Bureau of Justice Statistics

**1/14** 1 in every 14 children will experience a parent's incarceration at some point.  
American Journal of Public Health

**5X** America's incarceration rate (716 per 100,000 people) is about 5 times higher than the median worldwide.  
American Journal of Public Health

cerated, the communities from which they come, and those to which they will return were in place long before it burst upon the scene.

Glaring health disparities can be found among the currently incarcerated. Patricia Yang, who earned her MPH and DrPH from Columbia Mailman School, is senior vice president of CHS. She notes that rates of syphilis are 140 times higher among those in New York City jails than in the general population; rates of hepatitis C and chlamydia are five times higher; and the rate of serious mental illness is close to 16 percent versus 4.6 percent in the wider population.

Yet that is just the tip of the iceberg. A recent study by Prins and colleagues at Columbia Mailman School and Wayne State University in Detroit suggests that higher incarceration rates are associated with increased rates of premature mortality at a county level. Data also show that counties with higher rates of incarceration show higher mortality rates, especially among teens and young adults. The effect was most pronounced with deaths caused by infectious dis-

ease, as Prins and Sandhya Ka-jeepeta, MSc, a PhD student in Epidemiology, noted in an article they recently co-authored.

Equally troubling, however, was the notion that high levels of incarceration—and the United States has the highest in the world—can compromise the health of community members who have never been involved with the criminal justice system. While jails and prisons may seem isolated, they are in fact highly permeable: Most people who are incarcerated return to their community, and the staff who work with them shuttle back and forth. At last count, there were at least 28,899 cases of COVID-19 among prison staff.

Prins traces the relationship between incarceration and community mortality rates to a constellation of material and psychosocial factors. Mass incarceration removes working-age adults from local labor markets and makes it difficult for them to find jobs when they return. Similarly, it impedes access to education by making it hard to stay in school or complete vocational programs. At the same time, a parent being incarcerated may result in children becoming homeless. It

degrades social ties and raises stress levels, affecting the health of adults and children alike.

Unfortunately, says Prins, while research shows that incarceration has little deterrent effect on crime and violence, resources have been poured into the carceral state at the expense of public health, education, housing, mental health and substance abuse treatment. As a result, the same marginalized groups whose health is most negatively affected by mass incarceration have been deprived of the supports that would mitigate its impact. “The coronavirus epidemic is helping people realize that the way that we do things, even under normal circumstances, is pretty bad,” he says. Prins and Fullilove, who is also a professor of Sociomedical Sciences, both advocate criminal justice reforms, such as eliminating pretrial detention, implementing bail reform, and choosing not to arrest and prosecute individuals for minor offenses. Prins notes that many of the measures that would protect vulnerable populations from the effects of climate change, such as investing in green jobs, strong public health-led pre-

vention and health promotion, and universal healthcare, would also improve life for those affected by mass incarceration.

Fullilove points to the Bard Prison Initiative (BPI), through which incarcerated persons in New York state can attend college, as an example of how to help address health inequalities created by incarceration. He leads public health trainings and serves as senior advisor to the initiative's Public Health Program. Since 2001, the initiative has equipped justice-involved individuals to become public health advocates: Incarcerated people can take courses in epidemiology, research methods, and health policy and management, while the BPI Public Health Fellowship offers formerly incarcerated individuals the opportunity to design and conduct original research. Fullilove and other Columbia Mailman School faculty teach in the program; and several of its alumni have earned master's degrees from the School. “These folks enter public health research with a different view of the world than somebody who's never been locked up,” Fullilove says. “I think they will amaze us with the ways in which they



**5,000** Each year, roughly 5,000 people die while incarcerated in the U.S.  
Bureau of Justice Statistics

**0.1%** Fewer than 0.1% of NIH grants focus on justice-related health research.  
*Annals of Internal Medicine*

can shed light on things we only dimly understand.”

For her part, CHS’s Yang emphasizes the urgent need for supportive housing for the formerly incarcerated and for compassionate release programs that can get the most vulnerable, such as older adults with underlying conditions, out of confinement. The pandemic has led to New York City alone releasing thousands of incarcerated individuals from its jails.

But much can be done in the way of clinical interventions, as well. During her time as director of health policy in the mayor’s office, Yang played a pivotal role in transitioning CHS from a private, for-profit contractor to New York City Health + Hospitals, the city’s public healthcare system. That led to the expansion of telehealth services and the creation of therapeutic housing units within jails. “In many respects, the quality of clinical care that we provide in the jails now exceeds that in the community,” says Yang, who adds that CHS employs a number of Columbia Mailman School graduates. Most recently, she won approval to build therapeutic housing units for in-

mates within city hospitals, potentially eliminating the need for the sickest patients to undertake a nine-hour trip to see a specialist.

**Under Yang’s leadership, CHS has also expanded its pre- and post-incarceration services.** A program now provides medical and mental health screening for individuals who are awaiting their day in court while in police custody. The results of those screenings help CHS better care for those who ultimately wind up in jail, and participants can also allow their defense attorneys to use the information to argue for alternatives to incarceration.

The Point of Reentry and Transition (PORT) team that Epstein runs offers a helpline that connects formerly incarcerated people with medical and social services. Providers can access patients’ jail-based health records, helping to ensure continuity of care. PORT clinics are staffed by community health workers who have themselves been incarcerated. They help patients navigate the system: scheduling appointments, assisting with prescriptions, and more. “We have folks who are incredibly unwell, for whom care coor-

dination can be challenging under the best of circumstances,” Epstein says. PORT eases their transition back to community-based care.

In the community, many formerly incarcerated people wind up at the Young Men’s Clinic, a partnership between Columbia Mailman School and NewYork-Presbyterian. Medical director David Bell, MD, MPH, estimates that at least 30 percent of his patients have a history of involvement with the justice system. “If attention to a health issue was delayed while they were incarcerated or they desire a second opinion, we address it. We screen for anxiety disorders, depression, and other mental health conditions. Judges and probation officers have referred patients to us,” he says.

Others at Columbia Mailman School are working to build a national effort to examine mass incarceration through a public health lens. The School’s Incarceration and Public Health Action Network, led by Dean Linda P. Fried, MD, MPH, and Patrick A. Wilson, PhD, is working to infuse carceral system reform issues into public health education. One area of focus: “We’re looking at schools as an

opportunity for public health intervention,” says Wilson, an associate professor in Sociomedical Sciences. “So much of the school-to-prison pipeline is about how you discipline kids.” At the root of poor behavior, he points out, you often find layers of issues, such as exposure to trauma. Wilson and colleagues are working to foster partnerships between schools of public health and local organizations to shut off the pipeline at its source.

All of those working in this area recognize that much more needs to be done to redress the health inequities experienced by those ensnared in the criminal justice system and those who are at risk of becoming so. But they also know that the work they do is already making real change in the lives of justice-involved individuals, their families, and their communities. Says Yang, “When you go home at night and look in the mirror, you know that you’ve done a good job.”

|||||  
*Alexander Gelfand lives in New York City. He has written for Columbia Medicine and often covers health and social justice.*

# Let the Data Do the Talking

An explosion of interest in powerful quantitative methods has taken hold from Wall Street to Silicon Valley, and public health is likewise engaging deeply with data science. In recent years, Columbia Mailman School faculty have employed new techniques to harness big data to evaluate health challenges, ranging from multiple chemical exposures to motor control impairment in stroke patients to the spread of COVID-19. In January 2020, the School hosted the Data Science for Public Health Summit, convening experts from more than 60 schools of public health. And over the past year, the University's Data Science Institute, the hub for collaborations between hundreds of faculty from every corner of the university, announced that a third of its seed grants will fund studies by Columbia Mailman School researchers. Most centrally, Columbia Mailman School and the Data Science Institute have launched a joint program in Data Science for Health, providing opportunities for public health students and postdocs to hone their skills. We gathered three faculty members to consider the challenges and opportunities of using data and teaching in this emerging field.

Interview by Tim Paul



Kiros Berhane, PhD, chair of Biostatistics, was lead biostatistician on one of the country's first longitudinal studies examining the long-term effects of air pollution exposure on children's health. His innovative biostatistical methods are used in studies of obesity, asthma, and neurocognitive health.



Jeff Goldsmith, PhD, associate professor of Biostatistics, develops methods for understanding patterns in large, complex datasets, including studies of movement limitations in people who have had a stroke and physical activity in children measured through wearable devices.



Jeanette Stingone, PhD, assistant professor of Epidemiology, conducts research that couples data science techniques with epidemiologic methods to investigate how prenatal and early-life environmental exposures affect health and development throughout childhood and beyond.



**Data science** The practice of recording, storing and analyzing data—often many kinds of data from many different sources—to extract useful information

**Artificial intelligence** Intelligence demonstrated by machines as opposed to humans; the term is used to describe computers that mimic cognitive functions that humans associate with the human mind, such as learning and solving problems.

**Machine learning** Algorithms build a mathematical model based on sample data, known as "training data," in order to make predictions or decisions without being explicitly programmed to do so.

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"question_1": "Let's start by defining our terms. What is data science?",  
"answer_1": [  
{  
  "Berhane:"Everyone has their own answer to this question. It's a bit like the adage of three blind men describing an elephant—it all depends on where you are situated. There are different flavors of data science, from the purely algorithmic predictive approaches that computer scientists use, to methods favored by public health scientists, which align data science's capabilities with understanding of biological mechanisms and employ statistical reasoning. In public health research, we work with a hypothesis and try to learn about what causes a certain disease in a way that makes sense in terms of human biology."  
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{  
  "Goldsmith:"Data science includes a lot of things that we've always done in public health research—thinking about the questions we'd like to answer, understanding the context in which data came about, and using the most appropriate tool to answer these questions—and doing all of these things in a way that is transparent and reproducible. What data science adds to this is a new perspective, one that recognizes modern data sources, exploratory methods, and computational approaches, and that raises the floor on the expected proficiency in tools for working with data."  
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{  
  "Stingone:"Rather than thinking about data science as a departure from biostatistics, we should think of it as an integration of traditional biostatistics and computational skills, grounded within substantive knowledge. That intersection is where we can find new ways to gain insights based on the massive and still growing information now available to us."  
},  
{  
  "Berhane:"As the ways we acquire and use data change, increasingly we're going to be infusing artificial intelligence into the way we do things. We're in a continuous state of evolution. The data and capabilities are always changing."  
},  
]
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"question_2": "How are you each using data science to answer questions you wouldn't have been able to answer otherwise?",  
"answer_2": [  
{  
  "Stingone:"I'm an environmental epidemiologist focused on how communities are affected by multiple chemical exposures. Traditionally, we could look at one, two, maybe three chemicals at a time. Now, using machine learning, I can look at the health effects of many chemicals simultaneously. These methods are a starting point that allows me to see the data in a holistic way so I can ask better questions. They may trigger a hypothesis that can be tested using a method more closely tied to human biology—for example, that specific chemicals may interact with each other to disrupt the endocrine system and bring about disease."  
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{  
  "Goldsmith:"I study factors that are associated with physical activity—age, sex, season, measures of sociodemographic status, comorbidities, and others—often with a focus on understanding the determinants of activity in children. I've conducted similar analyses in older adults, in patients following surgery, and in healthy workers. These projects utilize vast amounts of data and seek to identify possible interventions that promote activity, or to evaluate the impact of such interventions. The methods I've developed for these analyses are grounded in
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**Neural network** A set of algorithms, modeled loosely after the human brain, that are designed to recognize patterns in a set of data, through a process that mimics the way the brain works

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functional data analysis, a branch of statistics that focuses on high-dimensional data with complex structures."
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Berhane: "I'm in a research hub for Eastern Africa dedicated to environmental health and climate change. Much of the data have inconsistencies in spelling, formatting, etc. One of our data managers had the idea of using machine learning techniques to clean the data, which has saved enormous effort. In my primary area of research, increasing complexity and volume of environmental exposures are moving me to employ machine learning techniques."
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"question_3": "What do you make of so-called "black box" data science methods where data is fed into an algorithm, which then supplies an answer in a way that is opaque even to researchers? Are these methods at odds with public health science?",
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"answer_3": [
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Berhane: "Early on, computer programming techniques like neural networks and artificial intelligence were like a black box. Data science has come a long way. Today we're in a middle area with greater transparency as dialogue has increased between health experts, biostatisticians, and computer scientists."
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Stingone: "Even if you're using a really complex algorithm, you should have some rough idea of how it works. It's important that we know where the data are coming from; we need to be thoughtful about our analysis, and the conclusions we draw from the results. Without this kind of grounding, you're more likely to have ethical issues. "
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"question_4": "Can you say more about the ethical issues that may arise when using some of these data science methods?",
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"answer_4": [
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Stingone: "I'm currently working with the New York City health department as it uses machine learning tools to link various public health registries and create integrated health datasets. The problem is, data quality isn't equal across populations and can affect whose data may be excluded from those datasets. Without the careful attention to underlying differences in data quality by race or neighborhood, the information they get would be biased and would only benefit certain populations. These ethical considerations are very real. It's an opportunity for public health to bring our expertise to the table."
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Berhane: "A high volume of data can give people a false sense of truth. When you have a lot of information, people think that whatever answer comes out of it has to be true. As Jeanette points out, these data can be imbalanced. Your answer is supposed to apply to everyone, but it was not driven by data from everyone. If you ignore the core principles of public health science, including how you designed your study and where the data come from, you're in a garbage-in, garbage-out situation that reinforces inherent biases."
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Goldsmith: "Ethics is an area where public health researchers are really optimally positioned to make contributions. The training you get in public health includes
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    quite a bit that has to do with ethics, with the impact of studies on populations,
    with being concerned about justice and fairness and consent and data use."
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"question_5": "Today's job market requires students to be familiar with data
science. How do you teach data science to public health students?",
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"answer_5": [
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  {
    "Berhane": "Training our students in data science for public health is different
    from training in data science in general. We have the responsibility to train them
    not to just be proficient with the techniques but to use them in a responsible
    way, to pay attention to biological principles and public health principles."
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  {
    "Goldsmith": "I teach a class in data science that was originally intended for
    master's students in Biostatistics, and is now made up of roughly half master's
    students in Biostatistics and half students from other departments, including
    from across the University. Everywhere, students want this kind of training,
    and the training itself is evolving quickly. What counts as useful data skills now
    is completely different from what would have counted five or ten years ago."
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  {
    "Stingone": "Our students want to study techniques such as machine learning.
    In Epidemiology, we focus on giving students a baseline knowledge of what
    they need to know so they can collaborate with others. Not every student
    needs to understand the linear algebra that underlies machine learning, but
    they should all be able to understand a scientific paper that describes how
    these techniques are used in public health."
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"question_6": "Let's talk about the future. Where do you see data science for
public health going?",
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"answer_6": [
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  {
    "Goldsmith": "We're going to see a demystification of data science where you
    don't have to be a computer engineer and know how to train a neural network
    to be a data scientist. I also think we're going to see greater emphasis on ethics
    and reproducibility in data science outside of public health. Across the board,
    we're going to see a lot more data scientists."
  },
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  {
    "Stingone": "Technology is making it so we will get more and more refined data
    on population health and new tools to make sense of that data. That's going to
    be really exciting. We're also going to see more collaborations. Data scientists
    don't work alone. It's a group activity."
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  {
    "Berhane": "Data science is in an evolutionary state and will continue to change,
    hopefully for the better, as we have dialogue across disciplines. In public health,
    we will continue to emphasize careful study design and selection of data sources,
    inclusivity and representativeness of data, and careful interpretation of findings.
    I think it's going to have a very bright future."
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*Tim Paul is the editorial director of communications and editor of the Transmission newsletter. He has written articles on forced migration and health, environmental health, and other subjects.*

## It All Started With a Dissertation

Ilan H. Meyer, PhD '93

Ilan H. Meyer was always interested in mental health, stigma, prejudice, and stress, but he never imagined the path his career would take. In his doctoral dissertation for the Department of Sociomedical Sciences, Meyer proposed



a minority stress theory that predicted health disparities for sexual minority people long before there was empirical evidence of them. His research identified prejudice as a source of stress, including exposure to violence and discrimination, which lead to concealing one's sexual identity and to expectations that one would be exposed to stigma. It shows that these stressors are compounded for those with more than one minority identity.

The student eventually became a teacher, and Meyer was a professor at Columbia Mailman School from 1996 until 2011, teaching the first

LGBT health seminar and later editing both a textbook about LGBT health and the first issue of the *American Journal of Public Health* focused on the topic. In 2010, he was an expert witness in California's landmark trial challenging Proposition 8, which would have banned same-sex marriage. "Mailman was my home, my intellectual base, and what shaped me as a researcher to this day," he says.

Today, he is the Williams Distinguished Senior Scholar of Public Policy at the Williams Institute at the University of California, Los Angeles, School of Law. There, scholars in different disciplines apply research into sexual orientation and gender identity to law and policy. He has contributed briefs for U.S. Supreme Court cases and is the principal investigator of the Generations and TransPop studies, two U.S. national probability studies of public health of sexual and gender minorities, assessing stress, identity, health, and healthcare utilization. This research has yielded findings on subjects such as conversion therapy and suicidality, as well as use of preexposure prophylaxis, or PrEP, among transgender people.

"I've also begun looking at higher rates of incarceration among lesbian, gay, and bisexual people," he says. "Why does it happen? Once incarcerated, they tend to be victimized more and to receive harsher sentences. So again I am looking at stigma and prejudice."

Last fall, the American Psychological Association gave Meyer a Presidential Citation for his extraordinary contributions to psychological science and public health. "I often say to students: If you told me when I started that this is where I would end up, I would not have believed you," he says. "Students look at successful people and think it's a simple

trajectory. It's not. It's messy. Funding, publishing—it's not something that just happens easily. You have to persevere and move with the pressures that happen. Not everything is planned. Keep your focus but also keep an open mind."

In San Francisco, demonstrators awaited the 2012 court ruling that affirmed the unconstitutionality of Proposition 8.



## Mixing Art and Health

*Carey Jernigan, MPH '19*

In March 2020, visitors to the United Nations (UN) Headquarters in New York City found themselves surrounded by a sea of 30-inch wooden cubes. Two out of every three cubes faced forward, with the third rotated slightly to represent a sobering statistic: Worldwide, one in three women will experience sexual or intimate partner violence during her lifetime. The “One in Three” installation, which coincided with the 2020 Commission on the Status of Women, was created by Carey Jernigan. Jernigan put up the exhibition in partnership with the Spotlight Initiative, a joint effort between the UN and the European Union to eliminate violence against women and girls by 2030. Her own experiences of trauma as a teenager were the impetus for “One in Three,” but Jernigan wanted to include as many voices as possible, so the exhibition invites people from all over the world to submit clips of themselves closing their eyes for one out of every three seconds. “I wanted to do something that takes up space, and to talk about this experience that’s super prevalent but feels very isolating,” she says.

Jernigan spent 15 years in the world of fine art and furniture making before coming to Columbia Mailman School, having felt the pull of public health after working with trauma-focused nonprofits. “My background was different, but it helped me in my approach

to public health and added something to the teams I was on,” she says. Jernigan selected the Department of Health Policy and Management because she was particularly interested in how peoples’ experiences of trauma impact their interactions with the healthcare system. She currently works as a program coordinator for Choosing Healthy and Active Lifestyles for Kids (CHALK), New York-Presbyterian’s obesity prevention program.

Jernigan envisioned “One in Three” as a way to say goodbye to the arts community in her native Canada as she moved to New York to work in public health. The UN exhibition is a signal, she says, that “you can do public health work and bring your art with you.” She hopes that people from all over the world will continue to express solidarity and find community by submitting videos at [www.one-in-three.com](http://www.one-in-three.com).

—*Talia Nadel*

Jernigan among some of the cubes that compose “One in Three.”





**Development and Alumni Relations Welcomes a New Leader**

Barbara Howland Verrier has joined the School as associate dean for Development and Alumni Relations. A seasoned public health fundraising professional, Verrier previously served as director of principal gifts at The Johns Hopkins Bloomberg School of Public Health, where she helped spearhead the school's successful 100th anniversary campaign in 2016. "I have seen firsthand that public health alumni seek continual engagement both with the field of public health, and with their alma mater," she says. "I look forward to strengthening our alumni's connection and to building opportunities for the Columbia Mailman School alumni community to influence, inform, and improve the public's health. Offering professional networking opportunities, arranging channels for mentoring students, building interest group connections, and providing philanthropic platforms are all ways we will galvanize our alumni community going forward."

## Nurturing the Next Generation

*Wenimo Okoya, EdD, MPH '14*

When she began teaching middle school in Newark, Wenimo Okoya was interested in disparities in physical activity and nutrition among her students. She soon realized that their physical and mental health needs went much deeper, and were having a significant impact on educational attainment. One of her students struggled to stay awake and had fainting spells. She was

tion. When Okoya joined the team in 2014, they were working in three schools. Today, the initiative partners directly with five New York City schools, provides technical assistance for another school in Puerto Rico, and has offered trainings in close to 300 schools across New York City. They have also broadened their approach to include ensuring that schools are trauma-



referred to counseling but not to a physician, and it later turned out that she had leukemia. "The school failed her," Okoya says. "I can't help but think that if we applied a public health framework to how we approach students, we would be able to prevent more of that happening." These experiences led her to pursue an MPH in Population and Family Health.

After graduating, Okoya joined the Children's Health Fund's Healthy and Ready to Learn initiative, where she is now an associate vice president. The initiative aims to improve educational attainment by addressing health barriers to kids' educa-

sensitive. Outbursts in the classroom, increased absences, and decreased school performance may all be signs a child is experiencing trauma.

As a student at Columbia Mailman School, Okoya connected with mentors like Marina Catalozzi, MD, and Caroline Volel, MD, MPH '01 (with whom she took the Issues in School-Based Health course that she now teaches as an adjunct assistant professor). At the School, Okoya says, "I met people who were deeply invested in my education and in my success." Today she is making her own investment in the next generation of students. —*Talia Nadel*

## Putting Things in Perspective

*Brian Lehrer, MPH '96*

Described by *The New York Times* as “the high school social studies teacher we all wish we had,” Brian Lehrer has been an on-air voice of calm and clarity for New Yorkers since 1989. Each weekday morning, listeners from across the five boroughs and beyond tune in to *The Brian Lehrer Show* on New York City’s NPR affiliate WNYC or follow along online as he navigates everything from subway slowdowns to major historical moments like 9/11.

Since mid-March, Lehrer has hosted his two-hour show from his apartment in Northern Manhattan. Guests include politicians,



public figures, and experts—including a long list of Columbia Mailman School faculty—who take questions from Lehrer and from his listeners. When it comes to topics like COVID-19, Lehrer maintains an appreciation for scientific uncertainty and ambiguity. “I generally think one of the worst things about the media is that it’s become a cult of certainty,” he says. He prefers to “acknowledge uncertainty and ambivalence without people feeling powerless or that there is no path to moral clarity.”

Lehrer holds two master’s degrees—one in broadcast journalism and the other in public health, with a focus on Environmental Health Sciences. He recalls taking a valuable lesson from the story of Lois Gibbs, a mother-turned-activist who brought national attention to the toxic waste in Love Canal. “It gave me an early appreciation of citizen epidemiology and the importance of community, as well as expert voices in solving public health problems. I’ve been able to apply the deeper understanding of policymaking I got at Columbia to all kinds of policy areas.”

Honored with a prestigious Peabody Award for broadcast excellence in 2007, *The Brian Lehrer Show* was conceived in response to partisan talk radio as a means of democratizing the airwaves. Lehrer seeks to amplify the voices of people who are often sidelined by major media. During the Black Lives Matter protests earlier this year, for example, Lehrer opened the phone lines so listeners could hear firsthand from protesters. “One could say I get paid to talk for a living, but really, at least as much, I get paid to listen and to facilitate active listening by the audience,” he says. “Our audience is diverse, and listening openly to people unlike yourself hopefully builds community in our polarized world in needed ways.” —*Tim Paul*

## Making Medicines Safer

*Helen Edelberg, MD, MPH '02*

A friendship that began in the Executive MPH Program changed the course of Helen Edelberg’s career. When she enrolled, Edelberg was an assistant professor and attending physician, with a focus on geriatric medicine. “I loved taking care of patients, doing clinical research, and teaching. But at Columbia, I found myself with a more diverse set of colleagues. One classmate worked for a helicopter manufacturer, another for a nonprofit in Nicaragua.” Edelberg formed close friendships with her study



mates—“we called ourselves the Femme Five,” she says—and one friend, Kathy Bulgreen, opened her eyes to a new career path. “She helped me to realize that a better understanding of drug development could help me to achieve my goal of optimizing medications for older adults.” She finished her MPH, took a job at a pharmaceutical company, and “never looked back.”

Today, as vice president and head of medical safety assessment for solid tumor oncology at Bristol Myers Squibb in Lawrenceville, New Jersey, Edelberg oversees the safety of the company’s oncology portfolio. Her team manages safety from first human studies through postapproval surveillance. “As a geriatrician, I got tired of seeing products that were not studied in older adults. I wanted to make a difference from the inside,” she says. “My work is closely tied to public health. We collaborate with colleagues in clinical development, biostatistics, and epidemiology to understand products’ benefit-risk profiles. We have to understand what questions can be answered with which data.”

Edelberg, a former president of the School’s Alumni Board and founding chair of the Mentoring Committee, continues to mentor public health students. “I find it gratifying to see where our students end up,” she says. She never turns down requests for advice. Attending Columbia Mailman School, she says, was “one of the best decisions I’ve ever made.”

## Environmental Health in the Spotlight

A new study from the Columbia Center for Children’s Environmental Health (CCCEH) at Columbia Mailman School reports that the northeastern U.S.’s Regional Greenhouse Gas Initiative has been successful in substantially improving children’s health by reducing fine particulate matter emissions from power plants. Among the benefits between 2009–2014 were an estimated 537 avoided cases of childhood asthma, 112 fewer preterm births, and 98 avoided cases of autism spectrum disorder.

Initiated in 2009, the initiative took effect in nine states and limited emissions by fossil fuel power plants with a capacity of 25 megawatts or greater. “As impressive as they are, these estimates do not take into account the potential life-long consequences, so they are likely *underestimates* of the true benefits,” says lead author Frederica Perera, PhD, DrPH (below), professor of environmental health sciences and founding director of CCCEH. “These results should spur more such initiatives to address climate change and improve the health of our children.”

This research is only the latest finding to come out of the CCCEH, which since 1998 has followed a group of New York City children from birth to study the effects of air pollution. Other findings have prompted passage of laws to reduce exposure to pesticides, provided scientific support for the regulation of flame retardants, and contributed to industry shifts away from BPA and phthalates. These and other achievements led the National Institute of Environmental Health Sciences to give Perera its 19th Annual Spirit Lecture Award earlier this year.

On receiving her award, Perera shared these thoughts about why research is so critically important: “There are 82 billion neurons in the average brain, but almost all were formed before we were born. You can imagine how highly choreographed and complex this development is over a short time window, and how readily any external exposure...could disrupt these processes.”



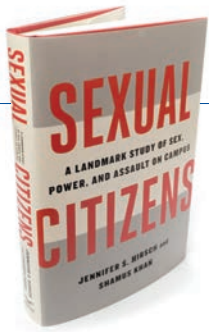
## Talking Housing and Health with Diana Hernández, PhD

“Housing is an important area of study and intervention, as it carries vital health and social implications. Housing is the focus of my research, business, and passion,” says Diana Hernández, PhD, an associate professor of Sociomedical Sciences and director of community engagement for the Center for Environmental Health in Northern Manhattan.

Hernández, who grew up in subsidized housing in the Bronx near Yankee Stadium, studies a number of issues related to housing that impact health, including physical quality and affordability. She has looked at the effects of smoke-free housing, capital improvements in public housing, and transitioning to “clean” heat. Her most innovative research looks at household energy as a determinant of health. “When people aren’t able to adequately meet their household energy needs, I call that energy insecurity,” she says. For example, heatwaves can trigger both physical and mental health conditions, but not being able to afford air conditioning can also have negative health effects. When people are imagining new climate policy or energy policies, low-income communities, communities of color, and medically vulnerable communities are not top of mind. But these populations are also the ones most likely to be severely, and sometimes fatally, impacted.

After graduate school, Hernández moved back to the Bronx and began to invest in improving and preserving her community. Over the last decade she has purchased a series of small multifamily apartment buildings occupied by people from the Bronx or other communities in New York City where displacement has occurred. “I’m putting my money where my heart is,” she says. “For me, doing this work is an antidote to gentrification and a way to pay it forward.”



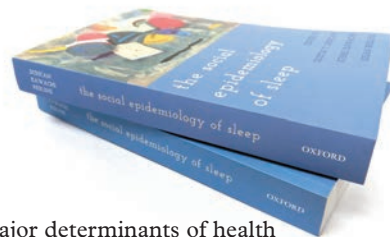


## An Eye-opening Look at Campus Sexual Assault

What are the social contexts in which sexual assault occurs and how can it be prevented? *Sexual Citizens: A Landmark Study of Sex, Power, and Assault on Campus* (Norton) by Jennifer S. Hirsch, PhD, professor of Sociomedical Sciences, and Shamus Khan, PhD, chair of Columbia's sociology department, draws on research from Columbia's Sexual Health Initiative to Foster Transformation (SHIFT), the most comprehensive study of sexual assault on a campus to date. Hirsch co-directed the SHIFT study, ethnographic research which consisted of more than 150 in-depth interviews and included a large survey of more than 1,600 undergraduates' histories, relationships, experiences with sex and assault. SHIFT team members spent time with students in dorms, fraternity houses, and places of worship.

*Sexual Citizens* examines how physical spaces, alcohol, peer groups, and cultural norms influence young people's experiences and interpretations of both sex and sexual assault and points out that most students come to college with little to no sex education or knowledge about the intricacies of interpersonal relationships. The book develops new approaches to making assault less common in college life. *Publisher's Weekly* says the authors, "illuminate the gray areas that define many college sexual assaults" and that the book "should be mandatory reading for college administrators and parents of college-age children."

## Examining Sleep, Deeply



A solid night's sleep is one of the major determinants of health and well-being, alongside a healthy diet and regular exercise. And now *The Social Epidemiology of Sleep* (Oxford University Press), co-edited by Dustin T. Duncan, ScD, associate professor of Epidemiology at Columbia Mailman School, offers a framework for understanding sleep health disparities and applies social science insights to address the public health problem of poor sleep health. Duncan and fellow editors Ichiro Kawachi and Susan Redline examine sleep as a determinant of health, synthesizing the current literature on the causes of poor sleep health and covering a range of sleep symptoms, patterns, and disorders across populations. Students and professionals across public health, epidemiology, medicine, demography, and sociology will find the book useful. The authors examine how sleep is influenced by race and ethnicity, socioeconomic status, immigrant status, stage of life and even neighborhood, among other factors.

## Students Partner with Community Groups During Summer of COVID-19

This summer, two student-led efforts partnered with New York City community groups to assess their experience of COVID-19 and assist with programming to help navigate not only the crisis, but also existing health and social inequities. Both were initiated by students in the Social and Economic Determinants of Health course taught by Kim Hopper, PhD, professor of Sociomedical Sciences.

For the Citizen's Public Health Literacy (CIPHER) initiative, more than 40 students conducted literature reviews to identify reputable information on COVID-19, worked with community members to design and disseminate a community needs survey, developed online educational materials and programs, and shared their perspectives through op-eds and social media. "The COVID-19 pandemic provides a unique opportunity to collaborate with impacted communities. Our aim is to offer reliable, culturally appropriate information on COVID but to hand over the mic to community members," says Te Asia Hunter ('21), a CIPHER student leader.

In a separate initiative, MENTOR (Measuring and Evaluating the Needs, Talents and Opportunities for Results), students worked with community groups in Northern Manhattan to understand their experience of the pandemic, assess unmet needs, and support community programming. The group made a special effort to include recent immigrants, recently incarcerated individuals, unhoused people, and differently abled people in its programming. Both CIPHER and MENTOR are ongoing and continuing their work in the fall.

Students involved in CIPHER had a chance to make connections with community members who placed a fridge full of free food outside Word Up bookstore on 165th Street.

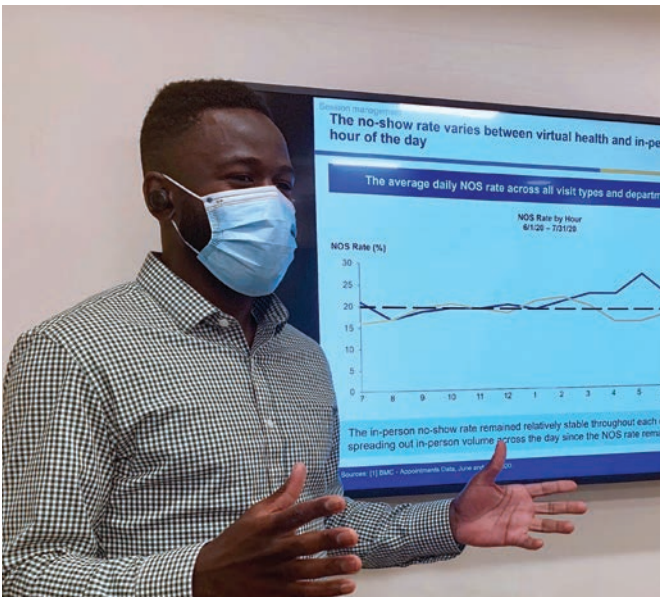




Virginia Dato, MD, MPH '92, popularized her design for a do-it-yourself mask made with scissors and a t-shirt.



Eamon Penney, MPH '17, helped coordinate COVID-19 response for Médecins Sans Frontières in Myanmar.



Richard Beaton, MHA '20, worked to expand telemedicine operations at Boston Medical Center Health System.



Patrick Dawson, PhD '19, on the job pre-pandemic at the CDC's Epidemic Intelligence Service.

## Alumni on the Front Lines of the COVID-19 Fight

With career paths that lead into the lab and around the world, the School's graduates turned out in a range of roles to manage the public health response to the pandemic. Lucretia Jones, DrPH, MPH '01, oversees the General Surveillance Unit in Communicable Disease at the New York City Department of Health and Mental Hygiene where she works with four fellow grads: Lan Li, MPH '14,

Alexander Davidson, MPH '14, Stephanie Ngai, MPH '14, and Emily McGibbon, MPH '04. Meanwhile, Patrick Dawson, PhD '19 (shown above) is at the Centers for Disease Control and Prevention. "Being a part of the CDC COVID-19 response has been a valuable training experience in frontline public health epidemiology, and has allowed me to experience the human side of the pandemic," he says.



“When I found out I got in to Columbia Mailman School, I had tears in my eyes—I’m a first-generation student. I went to school part-time and also worked full-time, but even with my job, I wouldn’t have been able to afford to go to school without the scholarship I received.”

—Emily Romero, MS '20, Biostatistics

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