

↑
**Can we
mitigate
the impact
of climate
change
on health?**

↑
**How do
we create
healthier
cities?**

↑
**Is it possible
to improve
our mental
health?**

↑
**Will
health
equity
become
a reality?**

↑
**Are we
ready
for the
next
pandemic?**

The full spectrum.

OF PUBLIC HEALTH. Climate, the planet, and health // Cities and health // Mental and behavioral health // Health inequities // Infectious diseases

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Dear *colleagues*,

In 2016, our school community celebrated its 40th anniversary. Little did we know at the time that we stood—as a country and as a world—on the brink of historic disruption as political shocks, social crises, and a global pandemic created intersecting challenges for public health. Many of these challenges remain with us, even as there are signs that we have begun to emerge from the pandemic, which has long been a central feature of our lives.

“Taking stock of the present, we find ourselves at a moment of learning; of reflection. We are also at a time of excitement, informed by our work advancing the future of public health.”

TAKING STOCK OF THE PRESENT, we find ourselves at a moment of learning; of reflection. We are also at a time of excitement, informed by our work advancing the future of public health. This is the work of all our faculty, staff, and students, informed by our vision as a school and guided by our strategic directions: cities and health; climate, the planet, and health; health inequities; infectious diseases; and mental and behavioral health. Our engagement with these focus areas helps support a vision of the future that is unstinting in its emphasis on what matters most for health. Our work on these strategic directions is the focus of this issue of *SPH This Year*.

Looking to this future, we also look, with pride, to our past. I have lately been doing much reflecting on our school’s upcoming 50th anniversary in 2026. As a preview of what is ahead, we will spend the next few years celebrating the core elements of our community. We will begin next year by celebrating our people—those who make up our school and our extended SPH family. We will then celebrate our place—our engagement with local community that is the bedrock of our work in public health. And finally, we will mark our time—the history that has shaped who we are and what we do, leading us into the future.

The theme of our last issue of *SPH This Year* was optimism. At a difficult moment, our community dared to imagine a better, healthier future. One year later, this optimism still stands. Informed by our history, invigorated by meeting a difficult moment and finding ourselves equal to the challenges we face, we are well positioned to help usher in a brighter future, working together towards better health for all. Thank you, as ever, for being part of this effort.

Warmly,



Sandro Galea, MD, DrPH
Dean and Robert A. Knox Professor
Twitter: @sandrogalea



“Public health doesn’t fear the complex challenges; instead, we leverage the scientific knowledge from across disciplines to see how the health of populations, of society, and of the planet can be improved by working together.”

Dear friends,

THE WORLD IS AN UNCERTAIN PLACE RIGHT NOW. We are confronted with the simultaneous challenges of war, climate crises, health and social inequities, and, of course, a pandemic that won’t go quietly into the night. It is quite easy to feel overwhelmed about the future.

And yet, public health is about hope.

Public health doesn’t fear the complex challenges; instead, we leverage the scientific knowledge from across disciplines to see how the health of populations, of society, and of the planet can be improved by working together. It is about training our students today to be the problem-solvers of the future. It is the work to meaningfully address challenges like gun violence, substance use disorder, sexual and reproductive health, and access to care. It is about collectively driving towards health equity.

At Boston University School of Public Health, students learn the skills that will help them heal the world. But they can’t do it without our support.

Our donations fund:

- Students from all social, economic, and geographic backgrounds who wish to attend a world-renowned school of public health
- Recruitment efforts to ensure the best teachers from around the globe join our highly regarded faculty
- Research projects, practicum opportunities, convenings, and ongoing community engagement

Collectively, our donations fund SPH’s ability to tackle the public health challenges outlined in the Strategic Directions highlighted throughout this issue of *SPH This Year*.

Please consider making a gift at bu.edu/sph/give to support our transformative work at Boston University School of Public Health. Thank you for engaging with our efforts and for your commitment to building a healthier world—together.

In gratitude,

Susan S. Garfield, DrPH (SPH’11)
Chair, SPH Dean’s Advisory Board

Support SPH now.



CLIMATE, THE PEOPLE, PLANETS, ANET, AND HEALTH

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Can we mitigate the impact of climate change on health?

Climate, the planet, and health//

STEPPING UP:

reducing the adverse health impacts and inequalities of climate change.

THE SCIENCE IS IRREFUTABLE: climate change due to human activity poses an urgent threat to the environment and to the health of the public, with implications at the local, national, and global levels. But the science is also clear that the actions we take today can mitigate current and future consequences of extreme weather events that are increasing in frequency and intensity each year.

The School of Public Health is at the forefront of research that identifies and reduces the health impacts—and the social and economic inequalities—linked to climate change.

Representing the school’s climate, the planet, and health strategic direction, much of this work now takes place through SPH’s Center for Climate and Health (CCH), which launched on Earth Day 2022. This cross-disciplinary endeavor fosters cutting-edge research and training in this area, helping communities around the world to be healthier, more equitable, and more resilient to the effects of extreme weather events.

“Climate change is perhaps the greatest threat to our health and well-being, and the concentration of people working in this space at BU School of Public Health is unparalleled to any other institution,” says Gregory Wellenius, CCH director and professor of environmental health (EH) and the strategic direction lead for climate, the planet, and health. “This is a public health issue that affects every one of us, and our actions today can help create communities that are more equitable and resilient in the future.”

BY JILLIAN McKOY
ILLUSTRATIONS BY
FIEN JORISSEN





RISING TEMPERATURES EXACERBATE PHYSICAL, EMOTIONAL DISTRESS

Researchers at SPH's Center for Climate and Health have found that as the weather gets hotter, heat-related illnesses and emergency department visits increase nationwide. Acting as an external stressor, extreme heat exacerbates existing health issues including anxiety disorders, mood, overall stress, and self-harm.

Source: Boston University School of Public Health/Center for Climate and Health

FOCUSING OUR ENERGY

Climate and health research at SPH spans three broad pillars: understanding the adverse health impacts of climate change; quantifying the immediate health benefits of actions to limit climate change in the future (i.e., “climate co-benefits”); and climate change resilience—evidence-based research and guidance that enables cities to prepare for and adapt to this worsening crisis.

As the year 2022 was predicted to be among the top 10 hottest years on record, many SPH faculty are studying the physical, mental, economic, and social impacts of extreme heat. Wellenius and Amruta Nori-Sarma, assistant professor of environmental health, published studies this year that linked hotter-than-normal days to increased visits to the emergency department nationwide among adults experiencing mental health crises, and among children and younger to middle-aged adults experiencing heat-related illnesses.

“We found consistent rates of emergency department visits for mood, stress, anxiety disorders, schizophrenia, and self-harm, indicating that extreme heat is an external stressor that can exacerbate existing adverse health issues,” Nori-Sarma says. “It’s important that we identify the populations most vulnerable to these conditions and tailor interventions and messaging to meet the specific health needs of communities.”

Madeleine Scammell and Patricia Fabian, associate professors of environmental health, are doing just that as co-principal investigators of C-HEAT, an ongoing project with environmental justice organization GreenRoots that examines heat exposure in Chelsea and East Boston households to inform policies that facilitate cooling in vulnerable homes. In Chelsea, the researchers measured a seven-degree difference between the hotter and cooler blocks on the hottest days.

“Through our mapping, we identified local heat islands and overlaid these with areas with a high density of vulnerable populations, such as affordable housing blocks, and shared this data with local stakeholders to determine where the cities can invest in cooling interventions,” says Fabian.

These efforts led to the installation of white roofs, trees, and water fountains.

According to Scammell, air-conditioning is the most important cooling factor indoors, but many residents lack physical or financial access to cooling systems.

Ultimately, “there is no policy to protect people from heat at work or at home,” she says. “Building resilient communities will happen through relationships, and through people becoming empowered and organizing

to change policies and systems that are beneficial to their neighborhoods.”

THE HEAT IS ON TO DO MORE

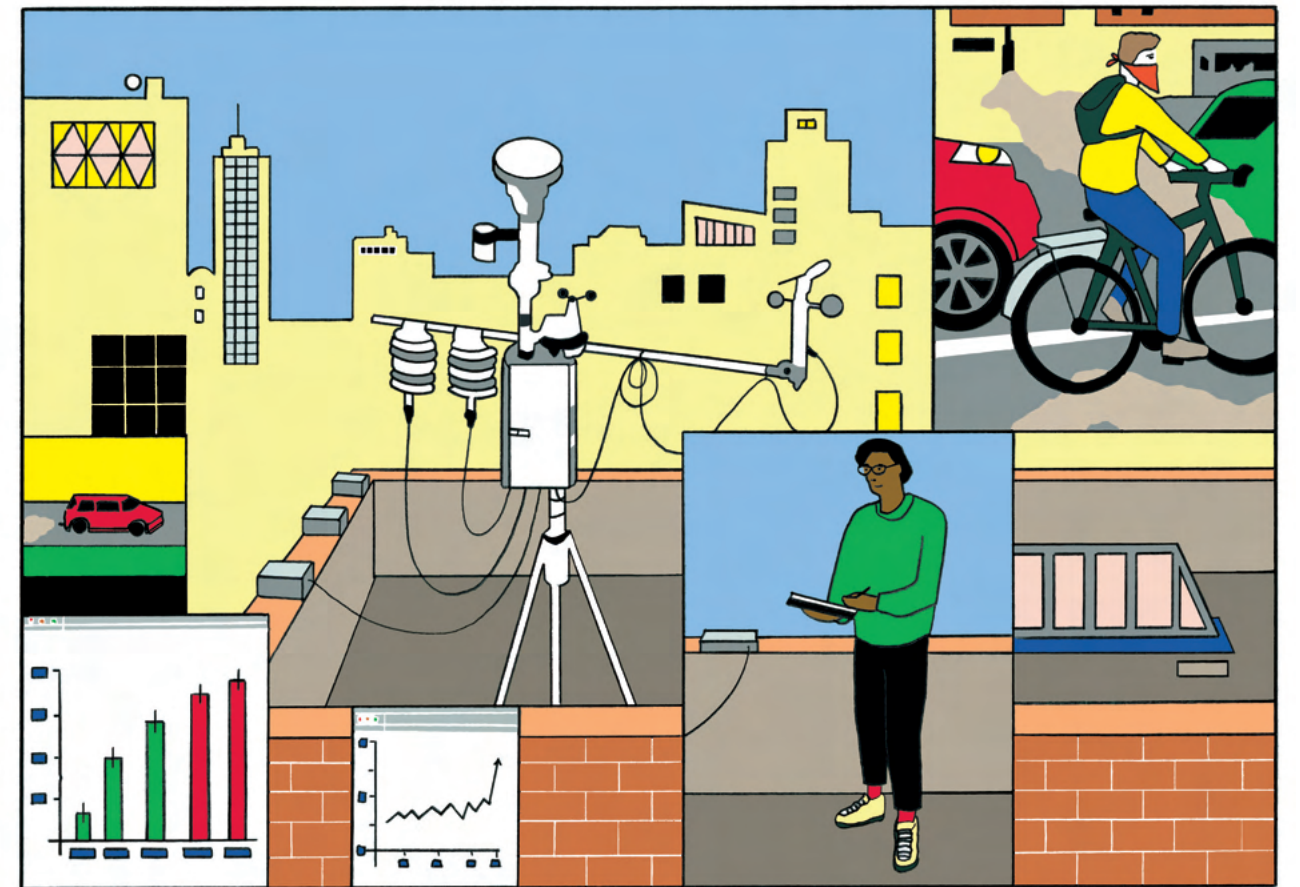
Keith Spangler, research scientist in environmental health and the Biostatistics and Epidemiology Data Analytics Center, and faculty are studying how to improve climate exposure measurements that inform local heat alerts. Cities use varying criteria that may identify extremely hot days, but not necessarily the days that are most dangerous for health.

“Moderate heat is also dangerous, but we want to avoid issuing so many alerts that people begin to not take them seriously,” says Spangler, who uses gridded weather reanalysis datasets to distinguish factors beyond temperature that would better determine when a heat alert is actually necessary. “We’re examining other metrics—such as indices that incorporate sunlight, wind, and humidity levels—that may lead to a greater health protective effect for issuing heat alerts.”

“This is a public health issue that affects every one of us, and our actions today can help create communities that are more equitable and resilient in the future.”

Gregory Wellenius, director of the Center for Climate and Health and professor of environmental health

ISTOCK.COM/SUDOWOODO



Cross-collaboration is crucial to the school’s climate and health work. Marcia Pescador Jimenez, assistant professor of epidemiology, studies links between greenspace exposure, neurodegenerative diseases, and racial disparities in health, while Jonathan Jay, assistant professor of community health sciences, has analyzed data that suggests a sizable proportion of shootings in the US are attributable to above-average daily temperatures.

“Some of the same interventions can address both heat and gun violence,” Jay says. “Tree canopy can offset the urban heat island effect, and it also appears that neighborhoods with more tree cover have lower gun violence.”

Faculty are also applying their climate and health expertise to international projects on air pollution. Kevin Lane is an assistant professor of envi-

ronmental health and the SPH lead for an international project called the Consortium for Health Effects of Air Pollution Research (CHAIR India), a multi-university collaboration of researchers who created a nationwide modeling tool this year that builds daily gridded models with air pollution and heat metrics across India spanning the past decade.

“These models enable researchers to conduct long-term climate studies at fine spatial resolutions to better understand the causal impacts of mortality due to air pollution and extreme temperatures,” Lane says.

CLEARING THE AIR

Patrick Kinney, Beverly A. Brown Professor of Urban Health in the Department of Environmental Health, has also developed local and

international data and solutions to the health consequences of air pollution. Twenty years ago, his research was among the earliest studies showing that climate change worsens air pollution and poses health risks. In more recent work, Kinney analyzed the potential air and health benefits of Boston’s plan to achieve zero carbon emissions by 2050, and he has collaborated with faculty researching how greenspace expansion and bike and pedestrian infrastructure can bring both health and climate benefits.

“By reducing carbon emissions, we have an opportunity to reduce other air pollution emissions,” he says. “By implementing low-carbon transportation options, we can clean up the air in cities at the same time that we’re helping the planet—a win-win situation.”

↓
A study led by SPH researchers and published in *The BMJ* shows that younger and middle-aged adults are more at risk for health issues due to extreme heat than older adults.



Climate, the planet, and health//

The heat is on adults of all ages.

NEW FINDINGS SHINE A LIGHT ON HOW EXTREME HEAT MAY AFFECT YOUNG AND MIDDLE-AGED ADULTS MORE THAN OLDER ADULTS.

A study led by SPH researchers found that complications from extreme heat appear to be more pronounced among young and middle-aged US adults than older adults.

Published in *The BMJ*, the study examined the connection between extreme temperatures and visits to the emergency department (ED), and found that days of extreme heat were associated with a higher risk of ED visits for any cause, heat-related illness, renal disease, and mental disorders among all adults, with the strongest association among adults aged 18–64.

While previous studies on the health impacts of heat have focused primarily on mortality or hospital admissions among seniors, this is the first national-scale assessment of the effects of extreme heat on adults of all ages, as well as the first national study to consider ED visits as a marker of adverse impacts of heat on all adults.

Senior author and Department of Environmental Health Professor Gregory Wellenius and colleagues analyzed anonymous healthcare utilization claims data to quantify the risk of ED visits for any cause, and for specific conditions

potentially associated with increasing temperatures during the warm season (between May and September) in almost 3,000 US counties from 2010 to 2019.

OptumLabs, a collaborative research and innovation center with its core linked data assets

“Younger adults may be at greater risk of exposure to extreme heat, particularly among workers who spend substantial time outdoors. Younger adults may also not realize that they, too, can be at risk on days of extreme heat.”

STUDY LEAD AUTHOR
SHENGZHI SUN,
RESEARCH SCIENTIST
AND ENVIRONMENTAL
EPIDEMIOLOGIST

in the OptumLabs Data Warehouse, provided the data. This database contains de-identified, longitudinal health information—including medical and pharmacy claims, lab results, and enrollment records—on more than 200 million commercial and Medicare Advantage enrollees and patients across the US.

Climate, the planet, and health//

Weathering the storm: coping with the effects of climate change.

CLIMATE CHANGE RESPONSE MUST ACKNOWLEDGE THE HISTORIC CONCERNS FACING LOW-INCOME COMMUNITIES OF COLOR.

IN THE SUMMER of 2021, two hurricanes broke rainfall and flooding records in parts of New Jersey, Philadelphia, New York City, and Boston. Hurricane Ida, in particular, pummeled New York City with more than seven inches of rain, causing the city to issue its first-ever flash flood emergency. Floods shut down subway stations, disproportionately affecting communities of color, and the storm turned fatal when people got trapped in their basements.

The hurricane exposed New York City's aging infrastructure and underscored how many cities are unprepared to withstand worsening weather events and other impacts of climate change, including wildfires, earthquakes, air pollution, and snowstorms. A recent report by the Intergovernmental Panel on Climate Change predicted that Earth is warming rapidly and in ten years, will likely exceed the level of warming that world leaders hoped to prevent.

"Impacts of extreme weather events, especially those involving

"Those responsible for planning disaster relief must acknowledge the historic concerns facing low-income communities of color that lead to inequitable outcomes in disaster recovery."

Amruta Nori-Sarma, assistant professor of environmental health

coastal storms, are very hard to predict with the level of temporospatial detail needed to avoid disastrous outcomes in specific locations," says Patrick Kinney, Beverly A. Brown Professor of Urban Health in the Department of Environmental Health. "Coastal flooding from storm surge is highly dependent on where and when the storm makes landfall with the greatest intensity, and where that comes in relation to normal tidal variations, which can vary a lot along an urban coastline."

Rain intensity can vary tremendously over short distances and times, leading to striking differences in impacts from place to place, he says. "While prediction models for these processes are continually improving, they still lack sufficient detail. Even if adequate predictions are available, communicating them to those in harm's way isn't easy in the midst of an evolving disaster."

Amruta Nori-Sarma, assistant professor of environmental health, points out that the many ways that



hurricanes can cause damage to mental health—including both direct and indirect impacts—is also concerning.

"Hurricanes can cause outages in power systems as well as communication networks, making it more difficult to get access to care," Nori-Sarma says, adding that this is especially an issue for people with existing chronic health conditions, including psychiatric patients who may rely on uninterrupted care and access to medication.

"Relatedly, patients taking medication for some psychiatric conditions may have issues with thermoregulation, which is especially a problem during power outages when there may not be access to air-conditioning facilities during times of high heat," she says. "People experiencing hurricanes are also at higher risk

for new-onset major depression, generalized anxiety disorder, and post-traumatic stress disorder, and people with substance use disorders may increase consumption or relapse if they are in recovery during hurricanes due to stress."

Nori-Sarma believes that hurricanes can also affect mental health by causing the lesser-known condition loosely referred to as "climate anxiety," which occurs when people experience generalized anxiety in anticipation of extreme weather events before the events have actually occurred.

"During the pandemic, a major concern was how to manage the care of people evacuating storm-ridden areas, and whether evacuation to large FEMA centers would lead to COVID outbreaks," she says.

↑ Severe weather events such as hurricanes can lead to flash flood emergencies that shut down subway stations and roads, severely limiting a population's mobility and transportation options.

Watch SPH researchers describe their work on health and climate.



QUINN ADAMS

QUINN ADAMS (SPH'21), DOCTORAL STUDENT,
DEPARTMENT OF ENVIRONMENTAL HEALTH

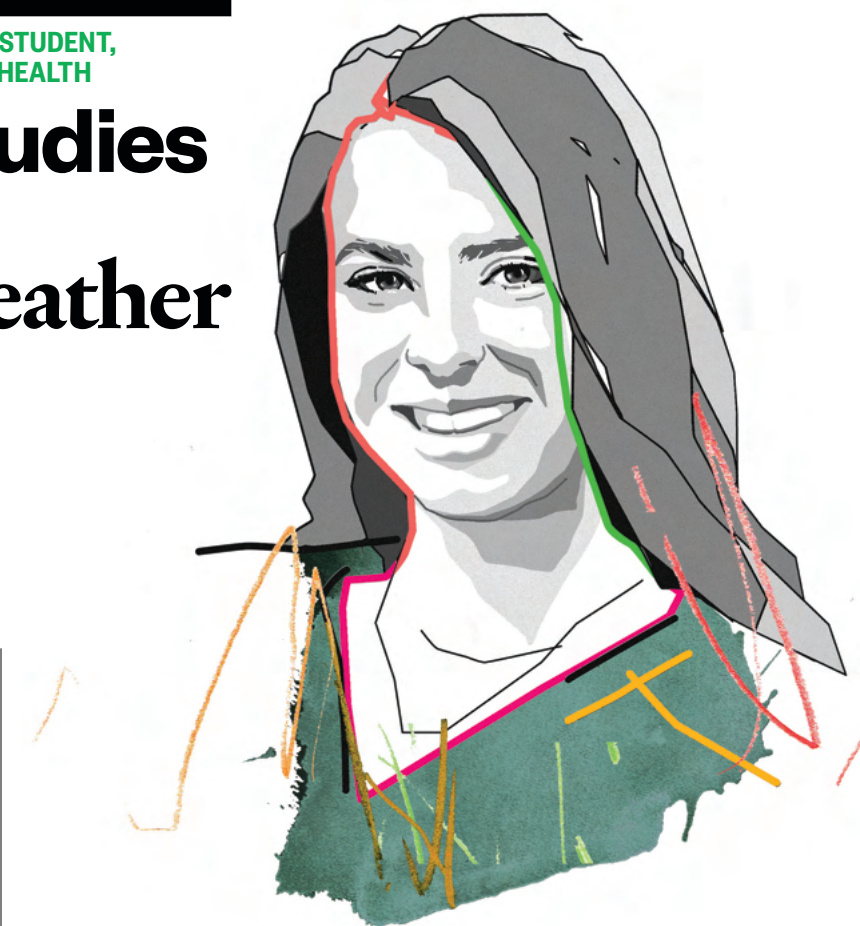
Student studies effect of extreme weather on health.

GROWING UP IN Boulder, Colorado, Quinn Adams (SPH'21) was always acutely aware of the surrounding environment. She spent most of her childhood outdoors, and when she wasn't hiking, biking, or skiing, she was talking about climate change with her parents and other climate activists in her neighborhood.

As an undergraduate student at the University of Colorado Boulder, Adams began studying environmental health and atmospheric sciences, and started to gain a better understanding of the influence that the environment and climate change can have on health.

In 2021, she earned an MS in Climate and Health through the SPH Population Health Research program and is now pursuing her PhD in environmental health at the school, with a major in environmental epidemiology and minors in biostatistics and infectious disease. She is also enrolled in the BU Graduate Program in Urban Biogeoscience and Environmental Health (URBAN).

ILLUSTRATION PADDY MILLS



“The great thing about the climate and health field is that it is so diverse, and you can really explore your interests, no matter how varied they may be.”

Quinn Adams (SPH'21),
doctoral student,
Department of
Environmental Health

As she dives deeper into her PhD work, Adams says she hopes to begin studying the health risks of drought, rainfall, flooding, and hurricanes, as well as the impact of climate change on the distribution of infectious diseases over time.

“The great thing about the climate and health field is that it is so diverse, and you can really explore your interests, no matter how varied they may be,” she says. “It’s not only about epidemiology or atmospheric sciences; it’s city planning and government and all of these different pieces that intersect and weave together to protect the people living all around the world. There is a lot of room to be innovative and interdisciplinary, and it’s really exciting.”



Climate, the planet, and health//

Standing tall in the face of climate change.

PROFESSOR NAMED ONE OF THE WORLD'S TOP CLIMATE SCIENTISTS.

MICHAEL SAUNDERS

↑
 “A lot of things we can do to reduce carbon emissions can also be healthy for urban populations, such as providing opportunities and infrastructure for bicycling and walking rather than driving,” says Patrick Kinney, Beverly A. Brown Professor of Urban Health in the Department of Environmental Health. Here, the top climate scientist leads by example in Boston.

P

atrick Kinney, Beverly A. Brown Professor of Urban Health in the Department of Environmental Health, has been named one of the world’s top climate scientists by Reuters.

The Reuters “Hot List” of climate scientists identifies and ranks 1,000 experts based on how influential they are according to a combination of metrics, including how many research papers they have published on topics related to climate change, how often those papers are cited by other scientists in similar fields, and how often those papers are referenced in the press, social media, and other outlets.

Kinney ranked number 207 on the list, with 374 publications and 12,575 citations.

Trained as an air pollution epidemiologist, Kinney joined SPH in 2017 after two decades at the Columbia University Mailman School of Public Health, where he founded the first climate and health program. During his time at Columbia, Kinney’s work focused on the potential impacts of climate change on human health, including, for example, how extreme temperatures affect people living in cities.

“Cities like Boston and New York have already started taking this approach at a local level, looking for climate solutions and setting ambitious carbon emission reduction goals,” he says. “A lot of the things we can do to reduce carbon emissions can also be healthy for urban

“**More and more, public health experts are being called on to help guide the actions cities are taking to tackle climate change in ways that promote both health and equity. I think there are a lot of things to be encouraged by right now, especially the extent to which public health is beginning to lead the way.**”

PATRICK KINNEY,
 BEVERLY A. BROWN
 PROFESSOR OF URBAN
 HEALTH IN THE DEPARTMENT
 OF ENVIRONMENTAL HEALTH

populations, such as providing opportunities and infrastructure for bicycling and walking rather than driving or creating more green spaces and planting trees in local parks to help adapt to the changing climate.”

Working to build
resilient communities and
keep residents healthy—



Climate, the planet, and health

Cities and health

whether they're
around the world,
or around the block.



STOCKSTUDIOX/GETTY IMAGES

Increasing urban greenery could have prevented at least
34,000 DEATHS OVER TWO DECADES

←

In a groundbreaking study, SPH researchers have found that the positive health benefits of increased greenery can potentially lead to a longer life expectancy for seniors living in large US metropolitan areas.

INCREASING GREEN VEGETATION in large metropolitan areas could have prevented between 34,000 and 38,000 deaths based on data from 2000 to 2019. Researchers also found that overall greenness in metro areas has increased in the past 20 years, by nearly 3 percent between 2000 and 2010 and 11 percent between 2010 and 2019.

The nationwide study, published in the journal *Frontiers in Public Health*, builds upon well-established research on the health benefits of greenness by providing a quantitative value to the potential impact of urban greening initiatives on mortality.

According to study lead author Paige Brochu, a PhD student in the Department of Environmental Health, “Our study quantifies the impact of greenness expansion in urban areas and shows how increasing green vegetation could potentially add to a person’s life expectancy.”

For the study, Brochu and colleagues used publicly available data from the US Census, mortality data from the Centers for Disease Control WONDER system, and greenness data from NASA’s Landsat satellites to conduct a nationwide health impact assessment that estimated

“Our study quantifies the impact of greenness expansion in urban areas and shows how increasing green vegetation could potentially add to a person’s life expectancy.”

Paige Brochu, PhD
 student, Department of
 Environmental Health

increased green vegetation impact on all-cause mortality among adults 65 and older in 35 large US metropolitan areas. The study period focused on three distinct time periods across a 20-year span: 2000, 2010, and 2019. Using the Normalized Difference Vegetation Index (NDVI), a widely used metric that estimates the quantity of green vegetation, the researchers calculated that 34,080 to 38,187 elderly deaths—or about 15 to 20 deaths per 10,000 seniors—could have been prevented between 2000 and 2019 with a 0.1 increase in NDVI across all 35 metropolitan areas.

Brochu notes that greening may not be feasible in all cities due to differences in climate, water sources, urbanization, and landscape, but city planners can use the study findings to examine local changes in greenness over time and develop an appropriate and effective climate action plan in their cities.

THE GREENING OF US CITIES

11%

The overall greenness in metro areas increased by 11% between 2010 and 2019.

CITIES

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AND

HEALTHIER

How do we create healthier cities?

Cities and health//

NO LIMITS:

making cities safer and healthier for all.

“HOT TOWN, SUMMER IN THE CITY,” begins “Summer in the City,” a 1966 pop song by The Lovin’ Spoonful.

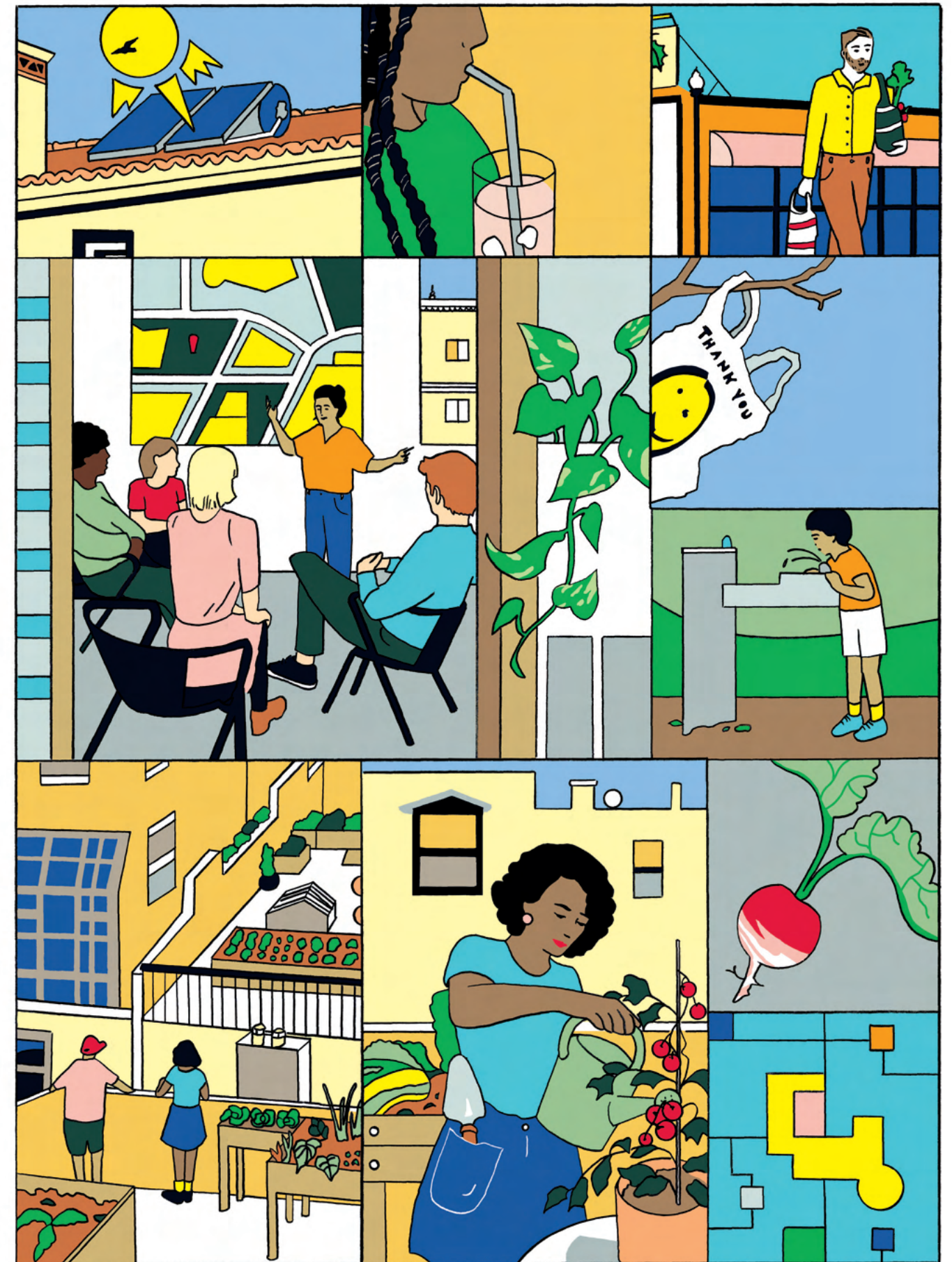
There are many reasons why the effects of climate change are more pronounced in cities, such as the impervious surfaces that create the heat islands described in the song’s lyrics: “Walking on the sidewalk, hotter than a match head.” Those same surfaces cause flooding during substantial precipitation, particularly because cities are often coastal.

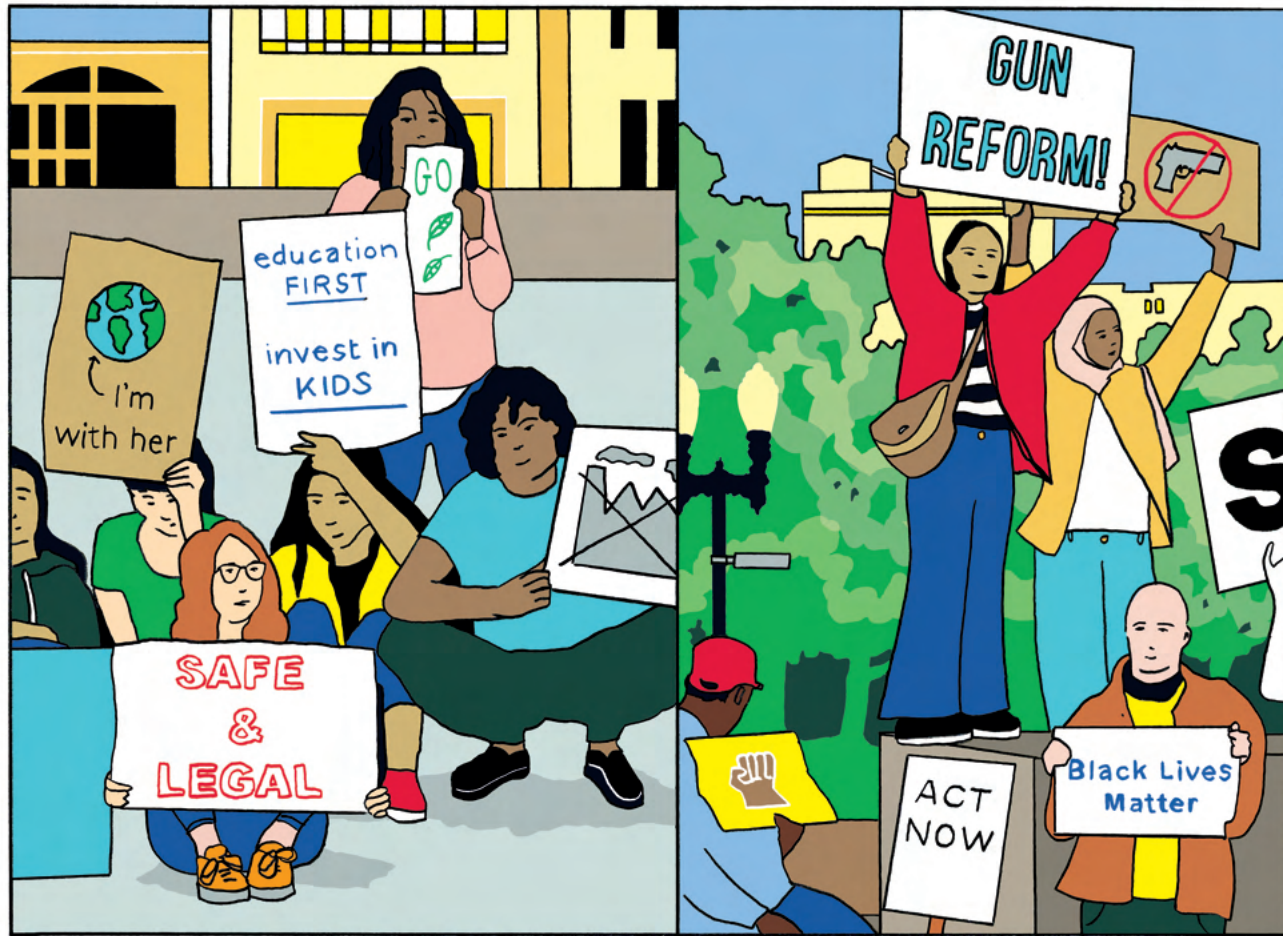
According to Patricia Fabian, associate professor of environmental health and the school’s cities and health strategic direction lead, they’re also where most people live, making them ripe for change—particularly if there’s a significant reason for change.

“Health is a powerful reason for people to do things,” Fabian says. “Maybe they don’t necessarily see the link between something like solar panels, or land use changes, or green space. I think that our job is to elevate and connect... all these different interventions we’re doing to health. I think that will help us get there faster.”

BUSPH is at the heart of change to improve health in cities through the work of its professors, students, and alumni.

BY TERESA WOOD KETT
ILLUSTRATIONS BY
FIEN JORISSEN





David Jernigan, assistant dean for public health practice and a professor of health law, policy & management, describes how change happens in cities using two major theory buckets: grassroots and grass tops.

He describes grassroots as individuals and advocacy organizations coming together in neighborhood or community meetings until there's enough momentum to attract the attention of policymakers, and grass tops as somebody with sufficient sway—a spark plug—driving change.

Jernigan is also a senior policy advisor for CityHealth, an organization that works with cities to adopt health improvement policies. CityHealth, which reports that more than 80% of US residents live in urban areas, develops evidence-based policy

packages for municipalities and awards bronze, silver, and gold medals depending upon how close the city is to adopting all of the policy's recommended elements.

“What we try to do at CityHealth is give them everything they would need to make that change, and then we motivate them with the medals,” Jernigan explains.

Alum Kate Conquest (SPH'21) is familiar with what these theories look like in action. In fall 2020, she jumped at the chance to enroll in Jernigan's course, Organizing and Advocacy for Health Policy Change. Conquest was assigned to research policies for CityHealth's 2.0 policy package, the next five-year iteration of policy implementation goals for cities that the organization will begin using in December

2022. All of CityHealth's policies are evidence-based and have been previously established in at least one venue.

Conquest's experience in the real-world application of public health work complemented her education. Hired full time in 2021 as a CityHealth program associate, she is assigned five cities. One of her first trips was to Louisville, Kentucky, where the city is considering green space and eco-friendly purchasing policies, two additions related to climate change in the new policy package.

“We've received a lot of questions about our housing policies, particularly on legal support for renters and getting them right to counsel,” Conquest says. “Green space comes up a lot for park access, and again, I think post-COVID, people started priori-

tizing park time and outdoor space. Those have probably been the policies we have talked about the most.”

“The theory and everything that we talked about in class is hugely beneficial, and I carry that with me in my job,” she says. “But you have to have been in the room with a lawmaker, talking to them. That's where you're going to... learn the most, when consequences are on the line, and when you have the ear of people who can actually make the decision and make that change happen.”

Wendy Heiger-Bernays, professor of environmental health, is the public health spark plug in her community just outside of Boston. She has volunteered as chair of the Lexington Board of Health for 22 years, leading policy decisions that are sometimes unfavorable, but grounded in the best data and information currently available. She says her well-resourced community of about 33,000 is an excellent testing ground for forward-thinking policies that can subsequently be implemented elsewhere. Jernigan, having seen cities become more willing to adopt new policies when provided with evidence that they have worked before, concurs that change happens this way.

Heiger-Bernays says that her multiple hats as a toxicologist, professor, and board of health chair are often symbiotic; her research informs her work at the local level, and the work she does at the local level informs her teaching.

This crossover played out when she was researching the effects of PCBs, PCB exposures in the communities around New Bedford Harbor, and in Lexington schools. People may be surprised to find these inadequately regulated chemicals in schools, but, according to Heiger-Bernays, schools lack adequate ventilation and the use of these chemicals in the buildings,

IMPROVING THE HEALTH OF OUR CITIES



80% of US residents live in urban areas

Source: CityHealth

“I think part of what makes this such a promising area of research and practice is that cities are always changing physically. There's always something happening in any given neighborhood.”

Jonathan Jay, assistant professor of community health sciences

furniture, and products may negatively influence the health of children, teachers, and staff.

“It's invaluable for MPH students to have practical information and practical tools to use, because not everybody needs to, or should, go into research. Public health is a marriage of research and practice. Without the two, all we're doing is pushing big numbers through computers and nothing ever happens,” she says.

Jonathan Jay, assistant professor of community health sciences, works at the heart of that marriage as an urban health researcher who uses analytics to inform decisions about the built environment that can help reduce violence.

“I think part of what makes this such a promising area of research and practice is that cities are always changing physically. There's always something happening in any given neighborhood. But sometimes the wrong things are happening in the neighborhoods that are most disinvested from, and most adversely affected by, racial segregation.”

Jay uses analytics to provide cities with data that aids in decision-making; he worked with Albany, New York, when the city had plans to demolish abandoned buildings and needed help determining which demolitions would be most likely to contribute to reductions in violence. He has also assisted Portland, Ore., in traffic-calming work to aid in gun violence reduction.

“We can make neighborhoods safer through these simple investments in the built environment. It is work that city agencies do all the time, but often in a way that is not focused on making places safer, which can further entrench racial inequities in access to resources,” he says.

A study has found that increasing greenspace in residential areas could help improve cognition function in middle-aged women and possibly help stave off dementia later in life.

Published in *JAMA Network Open* in April 2022, the findings reveal that exposure to greenspace around one's home and surrounding neighborhood could improve processing speed and attention, as well as boost overall cognitive function.

The results also showed that lowered depression may help explain the association between greenspace and cognition, bolstering previous research that has linked exposure to parks, community gardens, and other greenery with improved mental health.

"Some of the primary ways that nature may improve health is by helping people recover from psychological stress and by encouraging people to be outside socializing with friends, both of which boost mental health," says study lead author Marcia Pescador Jimenez, an assistant professor of epidemiology. "This study is among the few to provide evidence that greenspace may benefit cognitive function in older ages. Our findings suggest that greenspace should be investigated as a poten-



Cities and health//

An outside chance against dementia.

LIVING IN AREAS WITH MORE GREENERY MAY BOOST COGNITIVE FUNCTION.

MICHAEL SAUNDERS

“Our findings suggest that greenspace should be investigated as a potential population-level approach to improve cognitive function.”

MARCIA PESCADOR JIMENEZ, ASSISTANT PROFESSOR OF EPIDEMIOLOGY



Pescador Jimenez led a study that found that increasing greenspace in residential areas could help improve cognition function in middle-aged women and possibly help stave off dementia later in life.

tial population-level approach to improve cognitive function.”

For the study, Pescador Jimenez and colleagues from SPH, Harvard T.H. Chan School of Public Health, Brigham and Women's Hospital, Harvard Medical School, and Rush Medical College estimated residential greenspace with a satellite image-based metric called the Normalized Difference Vegetation Index. From 2014 to 2016 they measured psychomotor speed, attention, learning, and working memory among 13,594 women aged 61 on average and primarily white. The women were participants in the Nurses' Health Study II, the second of three studies that are among the largest investigations into the risk factors for chronic diseases among US women.

Earlier this year, Pescador Jimenez also received a three-year, \$738,310 grant from the National Institute on Aging to investigate the direct and indirect effects of greenspace on neurodegenerative diseases.

"My goal is to identify specific features of greenspace and the urban environment that will shed light on pathways to Alzheimer's disease and related dementias, cognitive decline, physical activity, depression, and hypertension," she says. In this project, Pescador Jimenez is also applying deep learning algorithms to Google Street View images to better understand which specific elements of greenery, such as trees or grass, could be the driving factors for health.

Cities and health//

All together now: collaborating across disciplines to drive change.

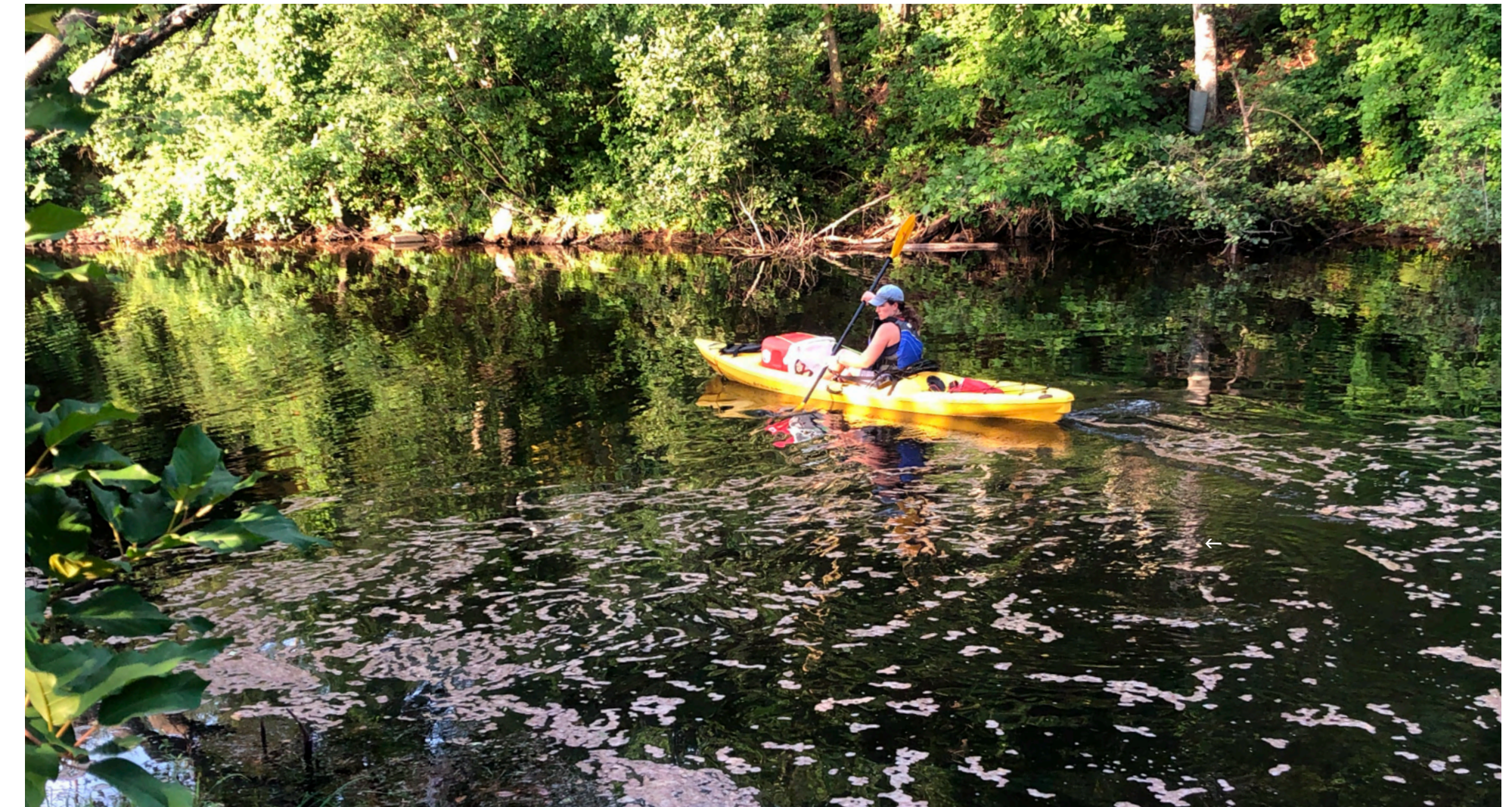
BU URBAN PREPARES STUDENTS TO TACKLE ENVIRONMENTAL AND CLIMATE CHALLENGES IN THE REAL WORLD.

THE GLOBAL URBAN POPULATION has grown rapidly over the last several decades to the extent that 68 percent of the world is expected to live in cities by the year 2050. This increased urbanization brings a number of environmental health and climate concerns, including elevated levels of water and air pollution, extreme weather, and disease.

The Boston University Graduate Program in Urban Biogeoscience and Environmental Health (BU URBAN) is designed to prepare PhD students at BU to tackle these urban environmental challenges. Throughout the program, students receive interdisciplinary training inside of the classroom and also learn about the inner workings of city government and the importance of communicating clearly with lay audiences through partnerships with government agencies, nongovernment organizations, and the private sector.

“Whether they go into academic or nonacademic settings after they graduate, we want to show our students how they can have an impact beyond the ‘ivory tower’ and have their research truly make a difference.”

Jonathan Levy, chair and professor of environmental health and associate director of BU URBAN



“Our goal is to develop a new cadre of scientists who can do work that matters for the real world,” says Jonathan Levy, chair and professor of environmental health at the School of Public Health and associate director of BU URBAN. “Whether they go into academic or nonacademic settings after they graduate, we want to show our students how they can have an impact beyond the ‘ivory tower’ and have their research truly make a difference.”

Since its founding in 2017, BU URBAN has worked to bring faculty, staff, and students together from across the University to drive change. Core faculty and student trainees

come from the Departments of Biology, Earth & Environment, Environmental Health, and Mathematics & Statistics; affiliated staff members represent a range of departments and centers at BU, including the Initiative on Cities and BU Sustainability.

“Real-world environmental challenges are complex, and they require people from multiple disciplines to work together to solve them,” says Pamela Templer, professor of biology and director of BU URBAN. Levy hopes that BU URBAN can show how the University can reframe how PhD training—which can often be unnecessarily narrowly focused on a singular topic—is conducted.

“We are trying to demonstrate that you can train students to have both depth and breadth, and that they can be masters in their own discipline while still reaching out to experts in other disciplines to learn from them,” Levy explains. “If we’ve learned anything from the COVID-19 pandemic, it’s that you can’t anticipate what problems are going to come and what sets of expertise you are going to need to address them. We want to train flexible learners who aren’t afraid to work with people in adjacent disciplines to solve new problems.”

Doctoral student and trainee Beth Haley, who studies water pollution and sewage overflows, says that the



Through BU URBAN, students like doctoral candidate Beth Haley, pictured here sampling near Manchester, N.H., study pressing environmental concerns.

opportunity to work closely with researchers who have studied similar environmental issues from different angles, as well as with community members who face these issues every day, has been an exciting part of her experience in BU URBAN so far. “These issues are complex,” she says. “They don’t exist in silos, and neither should our research.”

Watch BU URBAN researchers in action.



SAMANTHA MENARD

SAMANTHA MENARD (SPH'18), PUBLIC HEALTH INSPECTOR

Local public health inspector balances enforcement with compassion.



WHEN BROOKLINE, Massachusetts, Public Health Inspector Samantha Menard (SPH'18) started her job four years ago, what surprised her most were the shades of gray that come with the territory.

She knew that along with investigating environmental health issues, she would be enforcing the food code in restaurants, minimum standards of living in homes, and summer camp safety requirements. But she learned quickly that often, the boundaries of her work weren't always clearly defined.

Menard began as an environmental health inspector in Newton, Mass., just after finishing her MPH focused on epidemiology and biostatistics. Shortly before the pandemic, she moved to the Brookline Public Health Department, where she currently works.

The pandemic changed Menard's responsibilities when she was pulled into contact tracing, vaccine clinics, and helping businesses and residents

"It was kind of crazy because everyone was just finding out things in real time. The governor would announce something to the public as a new standard and, as local health officials, we would be finding out at the same time and then going right out and enforcing it."

Samantha Menard (SPH'18), public health inspector

navigate the ever-changing COVID-19 guidelines. Menard says there are stories that will stick with her.

"Cold-calling people who might be really sick, or have sick family members, or who just didn't want to talk to you was an experience and a half; very humbling. A lot of days were very stressful."

Menard described the challenge of interpreting new standards, figuring out where the gaps and inconsistencies lay, and managing those uncertainties.

"Within a month, I was working a completely different job than what I had worked the previous year. It was kind of crazy because everyone was just finding out things in real time. The governor would announce something to the public as a new standard and, as local health officials, we would be finding out at the same time and then going right out and enforcing it."

Cities and health//

The impact of race on road risk.

RACIAL DISPARITIES IN TRAFFIC FATALITIES WIDER THAN PREVIOUSLY KNOWN.

In 2021, nearly 43,000 people died in motor vehicle crashes in the United States, the highest number of US traffic fatalities since 2005. Meanwhile, US pedestrian deaths have reached a 40-year high.

This worsening and preventable public health problem affects certain populations more than others, and a study by researchers at the School of Public Health and Harvard T.H. Chan School of Public Health found that Black and Hispanic Americans are disproportionately affected by traffic-related deaths—and that these disparities are larger than previous estimates.

The findings showed that travel distances vary among racial/ethnic groups when walking, cycling, or driving and when differences in activity levels are taken into account, Black Americans had the highest traffic fatality rate per mile traveled and across all modes, followed by Hispanics, whites, and Asians. These disparities were particularly stark for walking and cycling and during evening hours.

“We have created a system where walking and cycling are more dangerous than driving, and where Black and Hispanic Americans are at greater risk of

fatality per mile traveled than white Americans,” says study corresponding author Matthew Raifman, a doctoral candidate studying transport, climate, and health at SPH. The study was published in the *American Journal of Preventive Medicine*.

Researchers examined 2017 national traffic fatality and household travel data and analyzed race/ethnicity differences in travel by mode, distance, time, and urban area. During all hours of the day, they found that white

“We have created a system where walking and cycling are more dangerous than driving, and where Black and Hispanic Americans are at greater risk of fatality per mile traveled than white Americans.”

MATTHEW RAIFMAN,
DOCTORAL STUDENT,
DEPARTMENT OF
ENVIRONMENTAL HEALTH

Americans biked at almost four times the distance per capita as Black Americans, but Black Americans died at more than four times the rate (4.5) per mile cycling than white Americans. Compared to whites, Blacks also experienced traffic deaths at more than twice the rate (2.2) per mile walking and nearly twice the rate (1.7) per mile driving or riding in a car.

↓
SPH researchers found that Black Americans have the highest traffic fatality rate per mile traveled and across all modes, followed by Hispanics, whites, and Asians. These disparities were particularly stark for walking and cycling and during evening hours.



TOA65/GETTY IMAGES/ISTOCK.COM

Improving the physical
and mental health

Cities and health

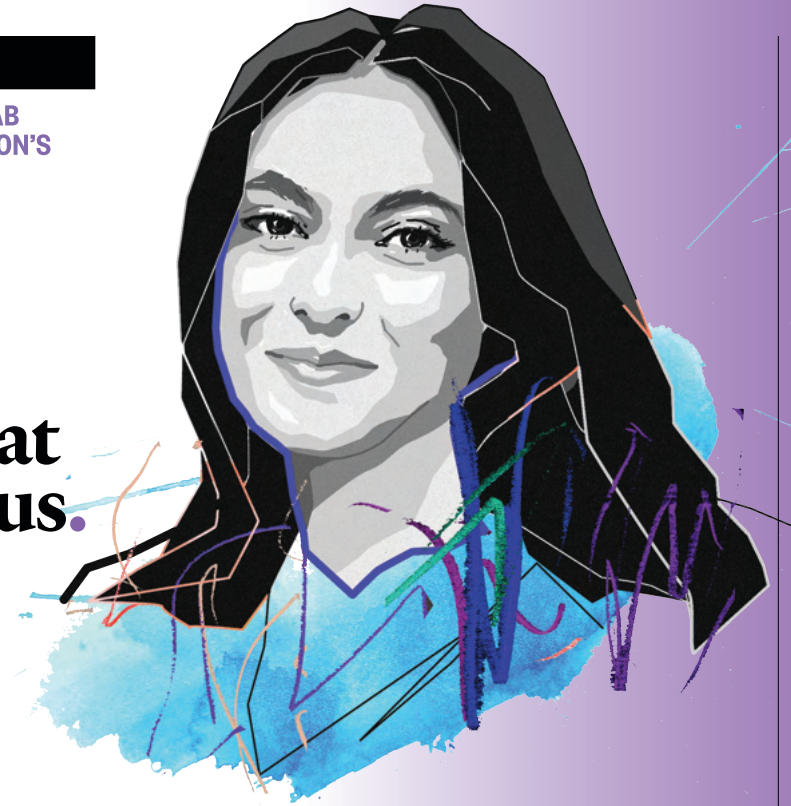
Mental and behavioral health

of everyone,
everywhere.

MONEESHA DASGUPTA

MONEESHA DASGUPTA (SPH'21), ACTIVIST LAB FELLOW, BOSTON PUBLIC HEALTH COMMISSION'S ENGAGEMENT CENTER

We should take the time to ask vulnerable populations what they need from us.



MONEESHA DASGUPTA (SPH'21) graduated in May 2021, after completing her dual degree for her MSW in clinical social work with a trauma specialization and her MPH with a CAPDIE (community assessment, program design, implementation, and evaluation) and Human Rights and Social Justice certificate. While a student, Dasgupta worked as an Activist Lab Fellow at the Boston Public Health Commission's Engagement Center, which provides a safe space and various health resources for people who experience substance misuse, homelessness, and behavioral health conditions.

WHAT DREW YOU TO APPLY AT THE ENGAGEMENT CENTER?

Moneesha Dasgupta: I was a part of BU's dual degree MSW/MPH program and had previously worked with an organization called Bay Cove for my social work clinical internship. I was a part of one of their small programs that was incredibly hands-on and helped around six individuals at a

"As practitioners, we should take the time to ask vulnerable populations what they need from us before we implement solutions."

Moneesha Dasgupta (SPH'21), Activist Lab Fellow, Boston Public Health Commission's Engagement Center

time who were suffering from homelessness. This experience was unique, as I would follow an individual from intake to discharge and learn all the moving parts of supporting people who experience homelessness.

WHY IS THIS PROJECT IMPORTANT? HOW DOES IT AFFECT HEALTH?

When we think about the intersectional identities that many homeless folks face, we see how easy it can be for this vulnerable population to sort of fall through the cracks of our healthcare systems. With homelessness comes so many adversities. We have the resources, and it comes down to how efficiently we are using those resources. We need to move forward with solutions. These solutions shouldn't come from upstream but from people whose lived experiences will enhance any proposed changes. As practitioners, we should take the time to ask vulnerable populations what they need from us before we implement solutions.

MENTAL AND BEHAVIORAL HEALTH

Is it possible to
improve our mental
health?

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(SPH'22) uses harm reduction
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Mental and behavioral health//

THE WAY FORWARD:

shifting from stigmas to solutions.

MENTAL ILLNESS IS RECOGNIZED as one of the world's most pressing public health issues, responsible for increases in mortality and morbidity across wide swaths of the population. In the US, the rate of mental illness is among the highest of all diseases, with more than 20% of adults afflicted each year, according to the Centers for Disease Control and Prevention. Lifelong health problems—among them chronic cardiovascular disease, psychiatric disorders, and behavioral conditions—can develop from untreated mental health conditions.

Despite these critical concerns, advancements in the mental health field around prevention and treatment lag far behind other focus areas of public health research, according to Jaimie Gradus, associate professor of epidemiology and the mental and behavioral health strategic direction lead at the School of Public Health.

“Progress is slow because the issue is difficult. We are not able to measure progress the way we can with other disciplines because we cannot physically observe these illnesses, and we largely operate in a crisis-based system, reacting rather than preventing,” she says. “In all of our decades of studying mental illness, we’ve gotten no better at prevention. Breaking down stigma and viewing mental health as public health is critical for reframing our approach and creating a system that prioritizes prevention.”

At SPH, researchers are at the forefront of mental and behavioral health scholarship, tackling the issue from a variety of angles to better understand and address the impact of mental illness, trauma, and substance use on health.

BY MALLORY BERSI
ILLUSTRATIONS BY
FIEN JORISSEN



YOUTH AND YOUNG ADULTS

In the US, youth in the juvenile justice system are 10 times more likely to suffer from mental illness than those not in the system, with over 70% having a diagnosable mental health condition, according to the National Alliance on Mental Illness (NAMI). Accessing care is a challenge for them, and these unmet needs can alter the trajectory of their lives, potentially leading to deeper court involvement later in life.

Patricia Elliott, clinical associate professor of community health sciences, is an evaluator for the Mental Health Advocacy Program for Kids, which offers free legal support to families with children in the court system in an effort to break down barriers to care.

“Court-involved youth are a vulnerable part of our community and made more vulnerable by their developmental life stage and reliance on adults to care for them,” says Elliott,

pointing out that the trauma and challenges these youth face directly affect their family unit, as well. “Our work aims to build systems that not only work for individuals, but also for their families.”

According to Sarah Lipson, assistant professor of health law, policy & management and co-principal investigator of the Healthy Minds Study, leaving home to attend college is often fraught with new experiences and learning curves for young adults, and thus a critical time for identifying and addressing mental health concerns. She says that approximately 75% of lifetime mental health problems start by age 24.

“The mental health crisis exists beyond the university setting, but we have an opportunity to intervene during this time, especially since colleges often have resources available with low barriers of access,” she says.

“Mental health during college is predictive of long-term health outcomes, productivity, and lifetime earnings, so the earlier we are able to identify these conditions and connect people to resources, the better.”

VETERANS

Currently, there are nearly 19 million living US military veterans, many of them facing widely known trauma-related challenges like post-traumatic stress disorder. However, many veterans are also at risk for lesser-known mental health conditions such as mood-related disorders caused by environmental exposures during service.

To better understand these “toxic wounds,” Kimberly Sullivan, research associate professor of environmental health, studies behavioral neurotoxicology and Gulf War Illness. Her research shows chemical exposures during service are associated with

problems related to memory, attention, and mood, as well as increased rates of depression and anxiety among veterans.

These adverse effects are not experienced only by veterans. “These wounds are similar to those seen in other occupationally exposed groups, including pesticide applicators and agricultural workers,” she says, emphasizing that investing in researching the long-term cognitive effects of these exposures is critical for improving the health of vulnerable populations around the world.

SUBSTANCE USE

The ripple effects of untreated mental illness can lead to a host of other public health concerns, including substance use. According to NAMI, more than 30% of adults in the US with a mental illness also experience a substance use disorder.

“People will often turn to substances as a coping mechanism for dealing with their stress and anxiety,” says Ziming Xuan, associate professor of community health sciences. “Mental health and substance use are deeply intertwined, so we must address both simultaneously.”

Xuan says that the social burden of substance use is huge, impacting not only individuals but also those around them. His work focuses on developing and implementing programs and policy interventions at multiple levels to provide community-wide education and link survivors of overdose and their families to medical treatments and support services.

STIGMA, COVID-19, AND MOVING FORWARD

From anxiety and depression to addiction and suicide, matters of mental health have long been labeled as personal failings. Over the last decade,

“Breaking down stigma and viewing mental health as public health is critical for reframing our approach and creating a system that prioritizes prevention.”

Jaimie Gradus, associate professor of epidemiology and the mental and behavioral health strategic direction lead at the School of Public Health

we once thought,” says Carol Dolan, clinical associate professor of community health sciences, who studies the impacts of stress and stigma on health. “We are not yet at a point where stigma is no longer a concern, but we’re making progress.”

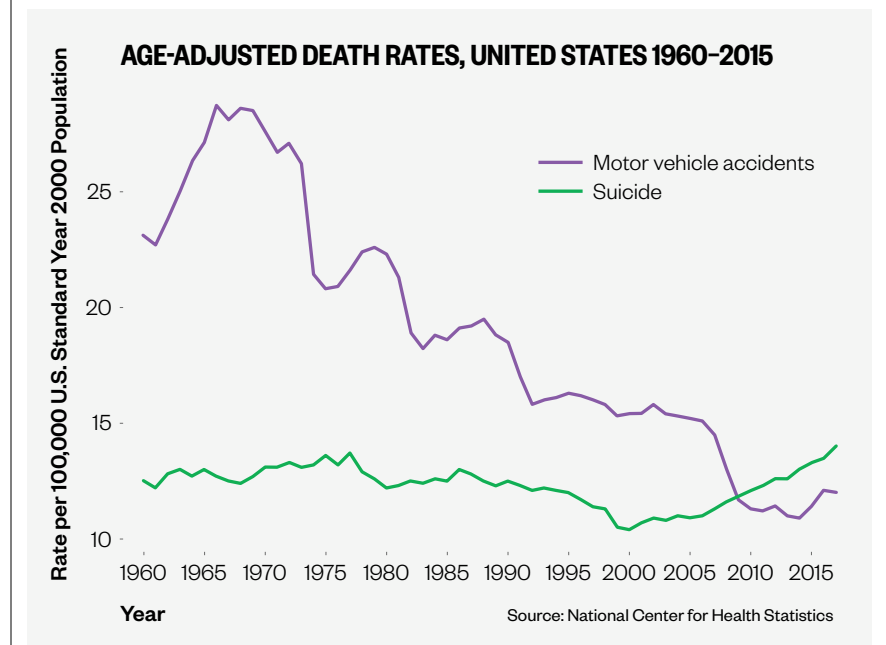
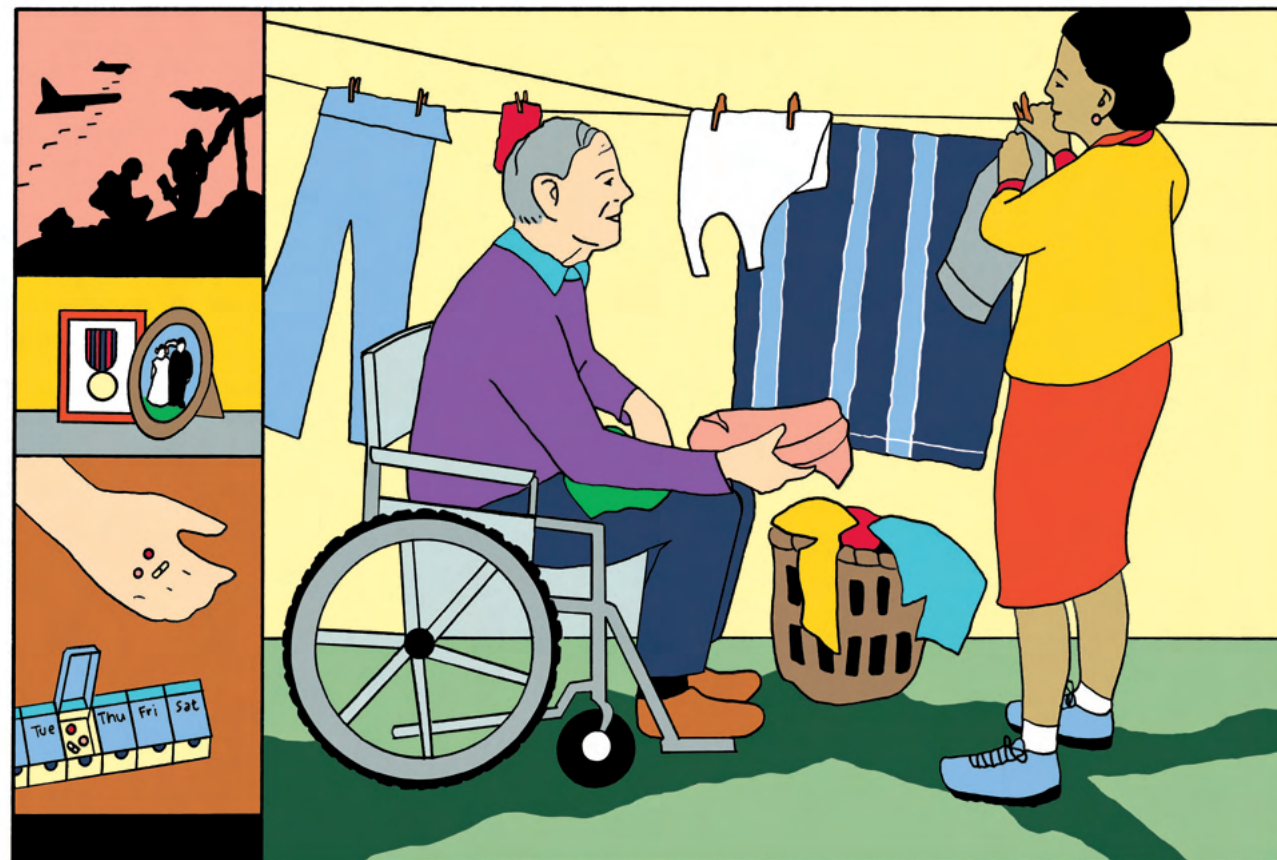
To ensure this shift continues in a direction that supports population health, Dolan emphasizes that the next generation of public health professionals must be trained to keep both mental *and* physical health at the center of their work, a concept that she says has often gone unrealized.

The increased attention on mental and behavioral health throughout the pandemic has been a turning point for this work, and one that Gradus hopes will continue to build momentum.

“From increased access to telehealth services to more resources and people being dedicated to this work, I hope I can look back on this moment as a catalyst for better approaches to the prevention of mental illnesses. We have an opportunity to learn from our past, from COVID, and make really meaningful advancements for the public’s health,” she says.

due in large part to the COVID-19 pandemic and the gaps it has exposed, mental health has ventured into the public discourse as never before.

“As a culture, we have started to realize that mental illness, substance use, and other mental health concerns are more commonplace than



STEPHEN MURRAY

STEPHEN MURRAY (SPH'22), FORMER LIEUTENANT, NORTHERN BERKSHIRE EMS, NORTH ADAMS, MASSACHUSETTS

Alum uses harm reduction to tackle overdose crisis.

STEPHEN MURRAY (SPH'22) is tired.

He is tired of seeing parents bury their children.

He is tired of the stigma surrounding people who use substances.

He is tired of pulling people out of the “stream,” dead or alive.

And he is demanding change.

Murray, a graduate of the Executive Master of Public Health program, worked as a lieutenant for Northern Berkshire EMS, which serves the city of North Adams, Massachusetts, and the surrounding communities of Northern Berkshire County and Southern Vermont. He responded to more than 100 overdoses in his EMS career. He is currently a community implementation specialist in the Clinical Addiction Research & Education unit at Boston Medical Center.

“When you work in frontline medicine, you hear a lot of stigmatizing language, especially towards people who use drugs,” Murray says. “Calling people addicts or junkies, or complaining about having to respond to another overdose. It is exhausting.”

This language is personal to Murray—he has been in recovery for more than 10 years.

“I am an overdose survivor,” he says, “and I often found myself in rooms full of people who were talking

badly about people like me, about people that I have cared about. It’s not right, and it needed to change.”

In 2019, Murray spoke at a Voices for Recovery event in North Adams, publicly sharing his story of recovery for the first time. He was in uniform. “It was important to me that people see someone in uniform unashamedly speaking about their own struggles with substance use.”

Murray has propelled himself into the national conversation on substance use, specifically harm reduction. He works closely with the organization Never Use Alone, a virtually supervised consumption site that offers an anonymous space to use substances safely.

“Being alone while using is the number-one risk factor for fatal overdose,” he says. “For me, there has always been this pressing need to convince people that using alone is really dangerous, and they can reduce their risk of dying by just being with somebody. Never Use Alone really functions to bridge this gap without shame, judgment, or pushing treatment on anyone.”


When someone is planning to use alone, they can call the Never Use

Alone hotline, where an operator will take their exact location and stay on the phone with them. If the caller becomes unresponsive, the operator will activate emergency medical services.

Murray helped to launch Never Use Alone hotlines in Massachusetts, New York, and Vermont, and currently works training phone operators.

He says he is increasingly frustrated with the system’s resistance to change, especially around drug use. He hopes to use his MPH to ultimately influence drug policy at the national level.

“If we want to have 100,000 people die a year, we can keep doing the same stuff over and over and expecting the same results,” he says. “We are not able to have supervised consumption sites or offer a safe drug supply, and we are obsessed with abstinence-based recovery. I’ve been responding to overdoses for eight years, and we still respond to the same, if not more, overdoses a year. What we are doing is not working.”

 *Hear from Stephen Murray as he describes his path from addiction to helping others.*



Mental and behavioral health//

Improving autism diagnosis through better screening.

AUTISM SCREENINGS IN EARLY INTERVENTION SERVICES CAN INCREASE DETECTION BY 60 PERCENT.

Implementing a multistage screening protocol for autism spectrum disorder (ASD) in early intervention services may lead to a 60 percent increase in ASD detection compared to standard screening, according to a School of Public Health study. The increased rate of ASD detection was nearly twice as high for Spanish-speaking families as for non-Spanish-speaking families, helping to reduce a well-documented health disparity.

The study, published in the journal *JAMA Pediatrics*, was the first comprehensive evaluation of ASD screening in early intervention (EI) settings and included comparisons with nonscreened I-settings. Unlike standard approaches to screening, which are often limited to providing questionnaires for parents, the multi-component screening protocol in this study included input from parents and EI providers in the decision-making process for a child's ASD diagnosis.

"When implemented with appropriate supports and access to diagnostic services, screening can really move the needle on the early detection of autism," says Radley Chris Sheldrick, study lead author and research associate pro-

fessor of health law, policy & management.

For the study, Sheldrick and colleagues analyzed records for 33,326 children ages 14 to 26 months. Compared to standard practice, this multistage screening process was associated with an additional 8.1 diagnoses per 1,000 children, and an additional 15.4 diagnoses per 1,000 children in Spanish-speaking families. Among non-Spanish-speaking families, the researchers observed a smaller increase in the rate of ASD detection, at an additional 6.9 diagnoses per 1,000 children.

“When implemented with appropriate supports and access to diagnostic services, screening can really move the needle on the early detection of autism.”

RADLEY CHRIS SHELDRIK, STUDY LEAD AUTHOR AND RESEARCH ASSOCIATE PROFESSOR OF HEALTH LAW, POLICY & MANAGEMENT

In addition to racial disparities, the researchers also observed gender disparities consistent with prior research showing that boys were significantly more likely to be screened and diagnosed with ASD than girls. The screening was associated with an additional 14.8 diagnoses among boys versus an additional 0.5 diagnoses among girls.

AARON AMAT/GETTY IMAGES



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In addition to racial disparities, the researchers also observed gender disparities consistent with prior research showing that boys were significantly more likely to be screened and diagnosed with autism spectrum disorder than girls.

NICOLE JETER

NICOLE JETER (SPH'19), DIRECTOR OF WELLNESS AND PREVENTION EDUCATION, PHILLIPS ACADEMY ANDOVER

Student social, emotional, and mental health needs must be prioritized.

THE COVID-19 PANDEMIC provided Nicole Jeter (SPH'19) with an opportunity to rethink the purpose of her public health work. With a background in community assessment, program design, implementation, and evaluation, plus previous experience in AmeriCorps VISTA, she knew she wanted to pursue a career that merged her interests in prevention education and working directly with youth.

Now, as the director of wellness and prevention education at Phillips Academy Andover, a boarding school in Andover, Massachusetts, Jeter oversees a variety of programming to ensure student health and well-being.

“Academics are important, of course, but the last two years of the pandemic have shown that students’ social, emotional, and mental health needs must be prioritized, as well,” Jeter says. “It is really important that young people have the tools and lifelong skills they need to lead healthy lives.”

ILLUSTRATION PADDY MILLS



“It is really important that young people have the tools and lifelong skills they need to lead healthy lives.”

Nicole Jeter (SPH'19), director of wellness and prevention education at Phillips Academy Andover

Jeter oversees Empathy, Balance, and Inclusion (EBI), a comprehensive wellness education program, serves as advisor on a peer-education effort that covers sexual health topics, and has worked on projects to support and strengthen peer-to-peer connections on campus.

“The goal is to always provide our students with tangible skills and takeaways that they can implement in their lives, whether that is here on campus, when they go home for breaks, or long into the future,” Jeter says. “I want them to thrive, so if I can help them understand how to manage their stress, to reach out to someone for support when they need it, or to even just take time out of their day for themselves, I feel like I will have accomplished something great.”

Mental and behavioral health//

Getting to the heart of the matter.

PROFESSOR RECEIVES \$2.5M NIH GRANT TO STUDY TRAUMA, MENTAL HEALTH, AND CARDIOVASCULAR DISEASE

Jaimie Gradus, associate professor of epidemiology, has received a \$2.5 million grant from the National Heart, Lung, and Blood Institute to explore how post-traumatic mental health conditions may affect cardiovascular disease risk.

Between 50 to 89 percent of people experience trauma at some point in their lives. These traumatic experiences are associated with a range of mental health conditions such as depression and substance use, but the majority of research focuses disproportionately on post-traumatic stress disorder (PTSD), which has also been linked to cardiovascular disease. The five-year grant will fund research to add knowledge on post-traumatic psychopathology beyond PTSD to better predict increased risks of cardiovascular disease.

“Trauma is associated with all forms of psychopathology, not just post-traumatic stress disorder,” says Gradus, coprincipal investigator of the grant. “The main aim of this grant is to examine whether different manifestations of post-traumatic psychopathology beyond PTSD are associated with cardiovascular disease, and determine which manifestations are the worst for cardiovascular health.”

Gradus and colleagues will use Danish records to assess a cohort of more than one million individuals who have experienced trauma. The study will incorporate machine learning and data science techniques to identify post-traumatic mental health conditions.

“We know that women are more likely to experience PTSD than men and there are also well-known sex differences in cardiovascular disease incidence,” says Gradus, who has studied PTSD risk, diagnosis, and treatment closely. “Given this, it is reason-

“**The main aim of this grant is to examine whether different manifestations of post-traumatic psychopathology beyond PTSD are associated with cardiovascular disease, and determine which manifestations are the worst for cardiovascular health.**”

JAIMIE GRADUS, ASSOCIATE PROFESSOR OF EPIDEMIOLOGY

able to assume that the association between post-traumatic psychopathology and cardiovascular disease may differ by sex, so the sex-stratified analyses will be an important aspect of this work.”

KELLY CULINAN



↑ Jaimie Gradus, associate professor of epidemiology, has been awarded a \$2.5 million, five-year grant from the National Heart, Lung, and Blood Institute that will fund research on post-traumatic psychopathology beyond PTSD to better predict increased risks of cardiovascular disease.

Bridging the
health gaps that
affect society's

Mental and behavioral health

Health inequities

most vulnerable
populations.

SIGALLE REISS

**SIGALLE REISS (SPH'05), DIRECTOR
OF PUBLIC HEALTH AND HUMAN
SERVICES FOR THE TOWN OF
BROOKLINE, MASSACHUSETTS**

Alum is Brookline's new health director.

AFTER A TUMULTUOUS two years for the public health field overall, Sigalle Reiss (SPH'05) took the helm as the director of public health and human services in the town of Brookline, Massachusetts.

Recent events have shined a light on public health, leading to much-needed workforce expansion. And, Reiss hopes, long-term support.

"It's awful as a world that we have to go through this. I think one positive is that people understand public health, its role, and how valuable it is."

Brookline, a large town of about 60,000 residents, is a well-resourced community known for doing cutting-edge public health work. "I like that no day is the same," Reiss says, describing a day that included COVID policy work, an artificial turf article for a town meeting, and a housing code violation hearing. "I love the diverse array of topics I get to be involved in."

Reiss expects to explore accreditation for the department, a voluntary program for state and



"I think there is an immense amount of power in local health for good reason. It protects the public health of the community or individuals depending on the circumstances."

Sigalle Reiss (SPH'05), director of public health and human services in the town of Brookline, Massachusetts

local public health departments that meet rigorous quality standards and have plans to continuously improve. Additionally, she's interested in examining data on the interaction between human services and public safety, domestic violence, mental health, and substance use.

"I think there is an immense amount of power in local health for good reason. It protects the public health of the community or individuals depending on the circumstances," Reiss says. "And just like any enforcement laws, whether we're talking public health or public safety, it's really the community that decides what powers the entity has, and the laws that govern those actions are dictated by the constituents. And we always have to remember that."

HEALTH INEQUITIES

Will health equity become
a reality?

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Health inequities//

A BROADER VISION:

improving health for all,
not just for some.

ALONG WITH ITS TOLL OF LIVES TAKEN TOO EARLY, the pandemic highlighted many of the substantial gaps in multiple systems that influence the health of society's most vulnerable populations. These groups—the poor, the elderly, the disabled, young mothers, and children—historically bear the heaviest burdens of disease.

Our collective experience over the past three years has shown us that interventions to reduce health inequities often fall short of achieving their intended goals, in part because many require broad policy changes that are beyond the reach of public health.

But what if public health can take a leadership role in assessing policies that improve at least some of the social determinants of health? Where would we see the benefits first?

Maternal and child health continues to be one of the areas poised for a substantial increase in improved health outcomes, in part because the current situation is so bleak.

BY MICHAEL SAUNDERS
ILLUSTRATIONS BY
FIEN JORISSEN



“People come to the US from all over the world, carrying with them not only their own individual life experiences and exposures, but often intergenerational trauma from the legacies of colonization and enslavement.”

Candice Belanoff, clinical associate professor of community health sciences

For example, Candice Belanoff, a maternal and child health epidemiologist and clinical associate professor of community health sciences, found that despite ongoing findings and interventions, racial inequities in preterm birth continue to widen in the United States, affecting non-Hispanic Black babies at nearly twice the rate of non-Hispanic white babies.

A key to this persistent gap can be found by taking a closer look, as Belanoff did in this study, at the specific individual backgrounds and circumstances of the birthing parents having these preterm babies. She and her team found the prevalence of preterm birth among Black immigrants varies widely by region and country of origin, and those who are foreign-born are less likely to have

a preterm birth than their US-born counterparts.

“The importance of disaggregating health inequities data wherever possible cannot be overstated,” writes Belanoff. “People come to the US from all over the world, carrying with them not only their own individual life experiences and exposures, but often intergenerational trauma from the legacies of colonization and enslavement. These are the factors we need to examine if we hope to understand racial inequities in perinatal outcomes.”

STRUCTURAL INEQUITIES RUN DEEP

Julia Raifman, assistant professor of health law, policy & management, uses observational data to study how policies drive disparities in population health. Researchers are able to use this information to study the dynamics of a disease as it progresses through a population, as well as related aspects of health outcomes. Prior studies coauthored by Raifman found that decades of structural inequities in education, employment, housing, stress, and other factors have shaped disparities in the burden of chronic diseases by race, ethnicity, and income.

Institutional policies play a large role in creating or exacerbating health inequities and thus can play a large role in combatting them, says Lois McCloskey, associate professor of community health sciences and director of the school’s Center of Excellence in Maternal and Child Health. The Black and Native maternal health crisis is a glaring example of the effect institutional policies can have on some populations.

“While there are deep, underlying reasons for the threefold higher rate of maternal deaths among Black and

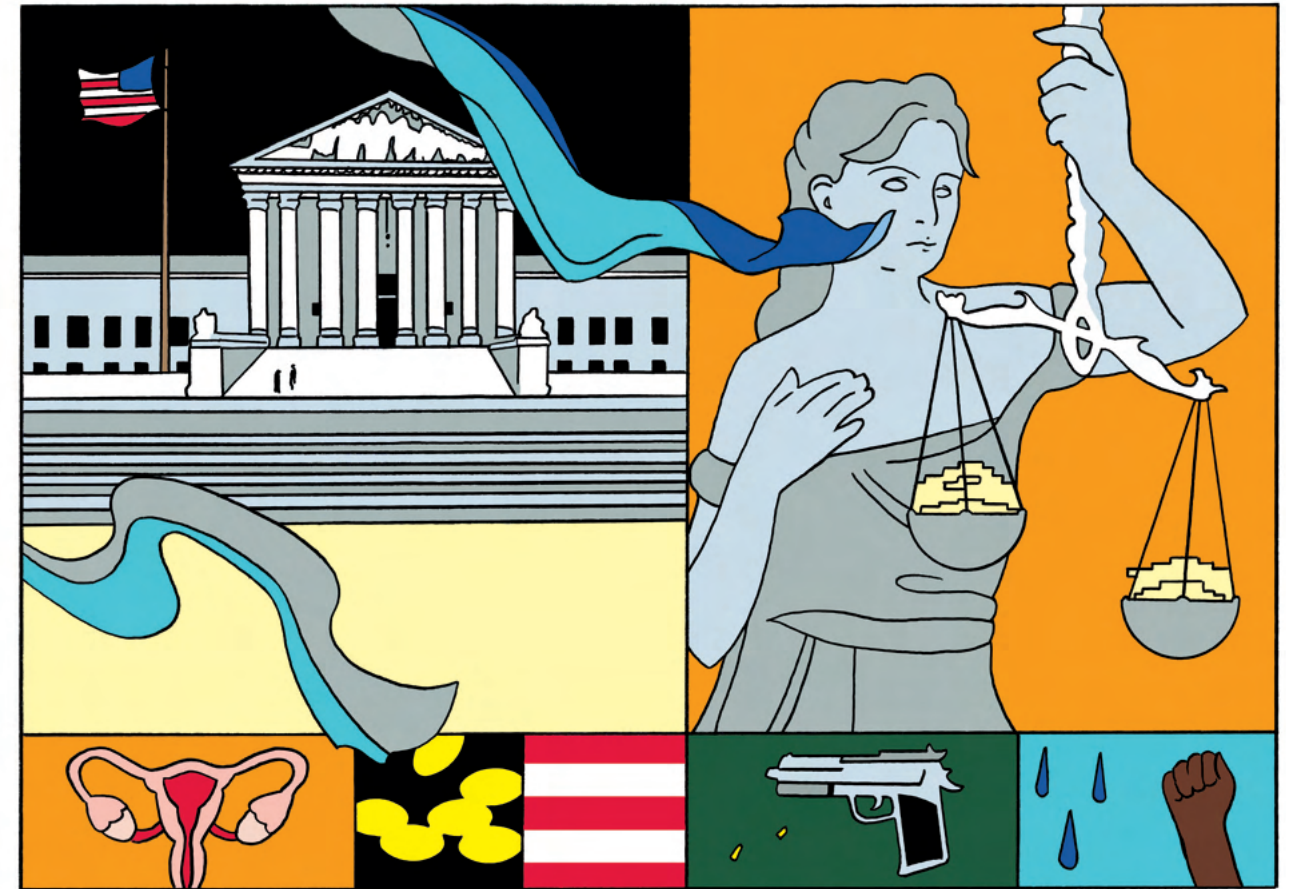
Native mothers in the US—namely longstanding multilevel structural racism—there are also reasons that can be stemmed at the institutions where pregnant people come for care before, during, and after pregnancy,” McCloskey says. “There are ample data and stories to remind us of how the failure of providers to listen to mothers and treat them with dignity and respect can lead to preventable death and ‘near misses.’”

Among the disturbing stories are the birthing experience of tennis star Serena Williams and the postpartum death of public health officer Shalon Irving. Williams suffered dangerous blood clotting immediately after delivering her baby, yet her concerns were initially downplayed by medical staff. Three weeks after giving birth, Irving collapsed and died from complications of high blood pressure.

Both women had the educational and financial means usually associated with healthy outcomes, yet both may have been subtly affected by what McCloskey terms the “cultures of disrespect” that Black and Native mothers in the US often face in medical settings. McCloskey believes that reducing this as a cause of inequity will likely require policies that support and require longitudinal training programs in antiracism and equity in maternity care, involving the accountability of providers through patient-derived metrics.

A POLICY OF RESPECT AND UNDERSTANDING

Representation matters, which is why another institutional policy lever to fight inequity may be mostly administrative: hiring and supporting providers who reflect a patient’s gender, race and ethnicity, culture, and language, McCloskey says.



“We know that concordance, having similar backgrounds and identities between patients and providers, is associated with better satisfaction with care, quality of care, and better health outcomes.”

Lois McCloskey, associate professor of community health sciences

“We know that concordance, having similar backgrounds and identities between patients and providers, is associated with better satisfaction with care, quality of care, and better health outcomes.”

Achieving any of this will likely be more difficult with the changes to reproductive health access in many parts of the country in the wake of the *Dobbs v. Jackson* decision that overturned *Roe v. Wade*. All are under threat at this moment in time, McCloskey says, and where one lives determines how serious the damage will be.

McCloskey points out the importance of viewing the loss of abortion rights within a reproductive justice lens, a framework introduced in the 1990s by organizations founded and led by women of color “in response to

3X There is a threefold higher rate of maternal deaths among Black and Native mothers in the US.

the failure of the reproductive rights movement to acknowledge the historic and current absence of choice in the reproductive lives of women of color,” adding, “Reproductive justice calls us all to consider the essential human rights that should govern the ability of one to choose to have a child or not have a child, and to raise children in safe and healthy environments so they can thrive.”

S

evere maternal morbidity (SMM), which refers to unexpected labor and delivery outcomes that can cause life-threatening maternal health problems, is on the rise in the United States and has been estimated to impact between 50,000 to 60,000 birthing people each year, according to the latest data compiled in 2014 by the Centers for Disease Control and Prevention.

However, these estimates have been based on cases identified during hospitalization for delivery, and do not reflect maternal health complications that may occur during pregnancy or the postpartum period.

A study led by an SPH researcher has found that excluding prenatal and postpartum health complications in SMM measurements substantially underestimates the burden of maternal morbidity in the US.

Published in the journal *Obstetrics & Gynecology*, the study examined cases of SMM during prenatal, delivery, and postpartum hospitalizations from 2009 to 2018 in Massachusetts and identified an additional 22 percent of cases that met SMM criteria. If the 2018 rates of SMM in Massachusetts with this expanded measurement were applied nationally, the true



Health inequities//

Taking the measure of maternal health.

SEVERE MATERNAL MORBIDITY IS SUBSTANTIALLY UNDERESTIMATED IN THE US.

HERO IMAGES INC./ALAMY STOCK PHOTO

22% An SPH-led team finds that including prenatal, postpartum periods expands severe maternal morbidity cases by 22%.

←

Health concerns are often heightened during pregnancy, and now an SPH study shows that more and better programs are necessary to combat severe maternal morbidity issues in pregnant people.

number of cases could be closer to 90,000 per year.

Using a longitudinally linked database, the study is the first of its kind to examine SMM during pregnancy, at birth, and postpartum.

“For this project, we expanded the focus of SMM from birth to health through the entire perinatal period,” said study lead author Eugene Declercq, professor of community health sciences. “The data overwhelmingly show that it is time to develop measures that more sensitively identified severe morbidities during pregnancy and postpartum.”

Declercq and colleagues analyzed data from the Pregnancy to Early Life Longitudinal (PELL) database, a Massachusetts data system that links records from birth certificates, delivery hospital discharge records, and nonbirth hospital records for all birthing people. Using CDC algorithms that define SMM criteria, the researchers examined nearly 600,000 deliveries, as well as hospitalizations during pregnancy and through 42 days postpartum, from January 2009 to December 2018. SMM increased

steadily over the study period, from 129.4 cases per 10,000 deliveries in 2009 to 214.3 cases per 10,000 deliveries in 2018.

Aside from blood transfusions, which cause the largest percentage of SMM cases, the leading causes for additional cases of severe morbidity during pregnancy and postpartum were sepsis, thrombotic embolism, and adult respiratory distress syndrome.

“Our findings underscore the need for a greater investment in outpatient, community-based programs and quality improvement initiatives,” Declercq said, citing examples such as standardized, outpatient risk assessment screening for venous thromboembolism, prevention of maternal peripartum infections via screening and vaccinations, and postpartum home blood pressure monitoring for birthing individuals at increased risk.

The study is the first of several publications by the research team as part of a larger project on SMM that is funded by the National Institutes of Health. The next two studies, informed by this first publication, will examine differences in SMM by race/ethnicity and an intervention at five hospitals in Massachusetts to assess the impact of doula care on pregnancy outcomes among Black women.

“Our findings underscore the need for a greater investment in outpatient, community-based programs and quality improvement initiatives.”

EUGENE DECLERCQ, STUDY LEAD AUTHOR AND PROFESSOR OF COMMUNITY HEALTH SCIENCES

Health inequities//

Closing the risk assessment gap.

RESEARCHERS DEVELOP BREAST CANCER PREDICTION TOOL FOR BLACK WOMEN.

Visit the *BWHIS Breast Cancer Risk Calculator*.



The lack of a breast cancer risk prediction model tailored to Black women represents a critical gap, given that US Black women, on average, are more likely to have breast cancer at earlier ages and with a worse prognosis than white women.

SPH researchers have developed and evaluated a risk-prediction model for breast cancer in US Black women that is suitable for use in primary care settings. They describe and evaluate the model in a recent report published in the *Journal of Clinical Oncology*.

Breast cancer risk-prediction tools are used by clinicians to identify women who are at a higher than average risk of breast cancer for early or more frequent screening by mammography and other modalities.

“Because US Black women have a disproportionately high rate of breast cancer deaths, improvement in early detection of breast cancer in this population is critical, especially in young Black women who have not yet reached the age at which mammographic screening is typically begun,” says study corresponding author Julie Palmer, professor of epidemiology and director of the BU Slone Epidemiology Center.

Palmer and colleagues used epidemiologic data from three case-control studies of Black women from various regions of the US to build a new risk-prediction model, testing it by using 15 years of follow-up data from 51,798 participants in BU’s Black Women’s Health Study. Discriminatory accuracy, which reflects how well a model

“**Because US Black women have a disproportionately high rate of breast cancer deaths, improvement in early detection of breast cancer in this population is critical, especially in young Black women who have not yet reached the age at which mammographic screening is typically begun.**”

JULIE PALMER, PROFESSOR OF EPIDEMIOLOGY AND DIRECTOR OF THE BU SLONE EPIDEMIOLOGY CENTER

predicts risk for an individual woman, was similar to that of the most frequently used questionnaire-based breast cancer risk-prediction models in white women, and was best for women under age 40.



NICOSAN/ALAMY STOCK PHOTO

↑ While self-checking is encouraged, the breast cancer risk prediction tool, developed and evaluated by SPH researchers and suitable for use in a primary care setting, will improve early detection of the disease in young Black women.

YVETTE COZIER

YVETTE COZIER (SPH'94,'04), ASSOCIATE DEAN FOR DIVERSITY, EQUITY, INCLUSION & JUSTICE AND ASSOCIATE PROFESSOR OF EPIDEMIOLOGY

Respecting the importance of a diversity of perspectives.

IN HER OWN WORDS

WE LIVE OUR commitment to diversity when we welcome to our school students, faculty, and staff with a diverse range of backgrounds and perspectives. We believe our community is at its best when it is a place where people from all walks of life come together in a shared commitment to the work of public health. Yet, it is not enough to simply bring people together. To truly gain the benefit of diversity, we need inclusion.

More broadly, fostering a diversity of perspectives is central to the mission of a world-class academic institution tasked with generating the ideas that shape a better, healthier world. It helps us to think critically, to see when we are wrong, and to improve at what we do. A university rests on a foundation of free speech and open debate. This foundation is strongest when everyone is included. Indeed, there may be some within our community who hail from a context where an inclusive public debate is not the norm, where social inclusion is determined by identity, class,

“For us to shape a healthier world, public health needs to reflect that world. It is not enough to be among the communities we serve; we need to be of them.”

Yvette Cozier (SPH'94,'04), associate dean for diversity, equity, inclusion & justice and associate professor of epidemiology

adherence to a given party line, or other such factor. It is important to learn from the perspective of those who have experienced such places, so we might better appreciate and support inclusivity within our own community.

For us to shape a healthier world, public health needs to reflect that world. It is not enough to be among the communities we serve; we need to be of them. Public health is at its best when its practitioners—and those with whom we partner—reflect all communities, all socioeconomic backgrounds, races, gender identities, and sexual orientations. Inclusion helps ensure that this diversity informs everything we do, supporting conversations in which all are heard, towards the goal of healthier populations.





Dr Tedros Adhanom Ghebreyesus
DIRECTOR-GENERAL

3-D COMMISSION PRINCIPLES



Principle 1
Decision-making to promote healthy societies needs to incorporate data on broader determinants of health.



Principle 2
All investment decisions in any sector need to be made with health as a consideration.



Principle 3
Decision-making that affects the health of populations needs to embrace health equity while acknowledging short- and long-term costs and benefits.



Principle 4
All available data on the determinants of health should be used to inform decision-making about health.



Principle 5
Data on the social determinants of health should contribute to better, more transparent, and more accountable governance.



Principle 6
Decision-making to promote healthy societies needs to be participatory and include multiple and diverse perspectives.

Source: "Data, Social Determinants, and Better Decision-Making for Health: The Report of the 3-D Commission" (Rockefeller Foundation-Boston University Commission on Health Determinants, Data, and Decision-Making)

Health inequities//

Looking at health through 3D glasses.

BU AND ROCKEFELLER FOUNDATION LED GLOBAL COMMISSION LAUNCH ROAD MAP TO BETTER HEALTH.



Dr. Tedros Adhanom Ghebreyesus (left), director-general of the World Health Organization, delivers opening remarks on the groundbreaking 3-D Commission report. Dean Sandro Galea, chair of the 3-D Commission, moderated a discussion of the findings.

REUTERS/ALAMY STOCK PHOTO

S

ocial determinants of health—the factors that shape where we live, work, learn, and play, from stable employment and housing to policies and laws, food access, and education—impact our health in many more ways than a doctor can.

These determinants matter, and a data-driven understanding of how and why they matter can lead to better decision-making toward policies that will improve population health, according to a new report by the Rockefeller Foundation-Boston University Commission on Health Determinants, Data, and Decision-Making (3-D Commission).

The commission released its groundbreaking report, "Data, Social Determinants, and Better Decision-Making for Health: The Report of the 3-D Commission" during a virtual event that coincided with the 76th United Nations General Assembly in New York. The launch event featured opening remarks by Tedros Adhanom Ghebreyesus, director-general of the World Health Organization, and Naveen Rao, senior vice president of the health initiative at the Rockefeller Foundation, as well as a discussion of the findings moderated by SPH

Dean Sandro Galea, chair of the 3-D Commission.

The comprehensive report is a culmination of nearly two years of exploration and analysis by the 25-member commission of experts in public health and data science. The 3-D Commission was created in early 2019

“Real-time data is essential for understanding what makes people healthier or sicker, and to shape policy decisions to support countries to progress towards these sustainable development goals.”

TEDROS ADHANOM GHEBREYESUS, DIRECTOR-GENERAL OF THE WORLD HEALTH ORGANIZATION

to explore how the rapid increase in big data could be leveraged to measure social determinants more effectively and foster better decision-making around health.

“Achieving a healthier world built on trust will require a commitment to the centrality of health equity,” said Salma Abdalla (SPH’16), research fellow, doctoral student, and the 3-D Commission’s lead project director.

Health inequities//

Following the Supreme Court's historic and far-reaching decision to reverse the federal constitutional right to abortion last June, School of Public Health faculty and alumni reacted to this consequential moment in history.

The overwhelming impact of

OVERTURNING ROE.

THE ENORMITY OF THIS DECISION CANNOT BE OVERSTATED.

“I’m concerned that reproductive health-care providers, overwhelmed already after COVID, will be spread thin in supportive states and feel defeated in states where they are unable to provide care. I also worry about their safety, as there has been increasing harassment and violence against providers in the past few years. My advice to providers is to stay strong, to remember why you took that oath to service your community, and continue to do that work as best you can in the situations you are facing.”

KRISTYN BRANDI (SPH'17), ABORTION PROVIDER AND BOARD CHAIR OF PHYSICIANS FOR REPRODUCTIVE HEALTH

“The court has been moving physicians to the margins of abortion regulation, but this is the first time in 50 years that the court has said it cannot figure out if abortion affects the lives and health of women, so it could think of no way to protect the lives and health of women under the equal protection clause of the 14th Amendment. The opinion is surprisingly shocking. Is this really a country of laws?”

GEORGE ANNAS, WILLIAM FAIRFIELD WARREN DISTINGUISHED PROFESSOR

“The enormity of this decision cannot be overstated. The court has reversed a constitutional right in overturning *Roe v. Wade* and *Planned Parenthood v. Casey*, the right to privacy as it protected access to abortion. This is an extremely unusual decision on the part of the Supreme Court and will undermine the legitimacy of the court as an institution in the eyes of many.”

NICOLE HUBERFELD, EDWARD R. UTLEY PROFESSOR OF HEALTH LAW

“I am sad that once again, women are viewed as little more than vessels, and that the poorest women are the most disposable. The rich will always have access to safe reproductive choices, including abortion. The poorest, who face the hurdles of access to healthcare and contraception, are now forced to continue pregnancies for which they are not guaranteed prenatal care, and give birth to children without a safety net.”

YVETTE COZIER, ASSOCIATE DEAN FOR DIVERSITY, EQUITY, INCLUSION & JUSTICE

“It will be challenging to precisely document at a population level what the impact of overturning *Roe* will be. What is clear, however, is that those states with trigger laws already have significantly worse maternal and infant health outcomes than those states without them, including shorter female life expectancy and higher rates of maternal and infant mortality.”

EUGENE DECLERCQ, PROFESSOR OF COMMUNITY HEALTH SCIENCES

“Now that our bodies, health, freedoms, and democracy itself are acutely endangered by an organized threat, it is right to embrace our sparked emotions. And though difficult, we must not let our feelings overtake us and those for whom we care. We need to act. Like the justice leaders of the past, as we care for ourselves and others, let’s channel our hearts and minds to learn all we can about these present threats.”

CRAIG ANDRADE, ASSOCIATE DEAN FOR PRACTICE AND DIRECTOR OF THE ACTIVIST LAB

Preparing and planning
for the next pandemic,



Health inequities



Infectious diseases

with an eye toward
improving equity.



ANDREW LICHTENSTEIN/CORBIS NEWS/GETTY IMAGES

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Flags planted at a memorial site in Washington, D.C., commemorate some of the more than one million Americans who died of COVID-19.

AS THE COVID-19 DEATH TOLL climbs past one million in the US, an SPH researcher seeks to understand the hidden aspect of COVID-19 mortality.

Andrew Stokes, assistant professor of global health, has studied COVID-19 mortality rates throughout the pandemic and has conducted several studies that suggest that the true number of COVID deaths in the US is likely much higher than records indicate—and that many of these uncounted deaths are occurring at home. These findings show that at least 20 percent of excess deaths—i.e., the number of deaths beyond what would have been expected in a normal year—were not reflected in COVID-19 death counts among US counties. The “hidden deaths” appear to occur more often in counties with fewer primary care physicians, less access to health insurance, and more home deaths—and disproportionately among communities of color.

Stokes is sharing the data and modeling from his work in a multi-pronged initiative with the Documenting COVID-19 project, an online repository of local, state, and federal public records obtained through

“Accurate and timely mortality surveillance is critical to pandemic preparedness and response efforts.”

Andrew Stokes, assistant professor of global health

open-records requests by reporters at the Brown Institute for Media Innovation and the collaborative news site Muckrock. Journalists working on the project are using this data to guide on-the-ground reporting across the US to uncover the true scope of underreported COVID-19 deaths with the findings detailed in a series of *USA Today* articles.

“Accurate and timely mortality surveillance is critical to pandemic preparedness and response efforts,” says Stokes, whose team of researchers at SPH, the University of Pennsylvania, and the Robert Wood Johnson Foundation has analyzed mortality data in more than 3,000 US counties.

Early articles examined the national data and social and racial inequities tied to excess mortality, including the findings thus far of undercounting in rural counties in Louisiana, Missouri, and Mississippi. Subsequent articles took deeper dives into these “hidden deaths” at the local level in other US counties, aiming to understand why and how they were excluded from official COVID-19 records in each area.

Documenting COVID-19 also necessitates relying on the knowledge

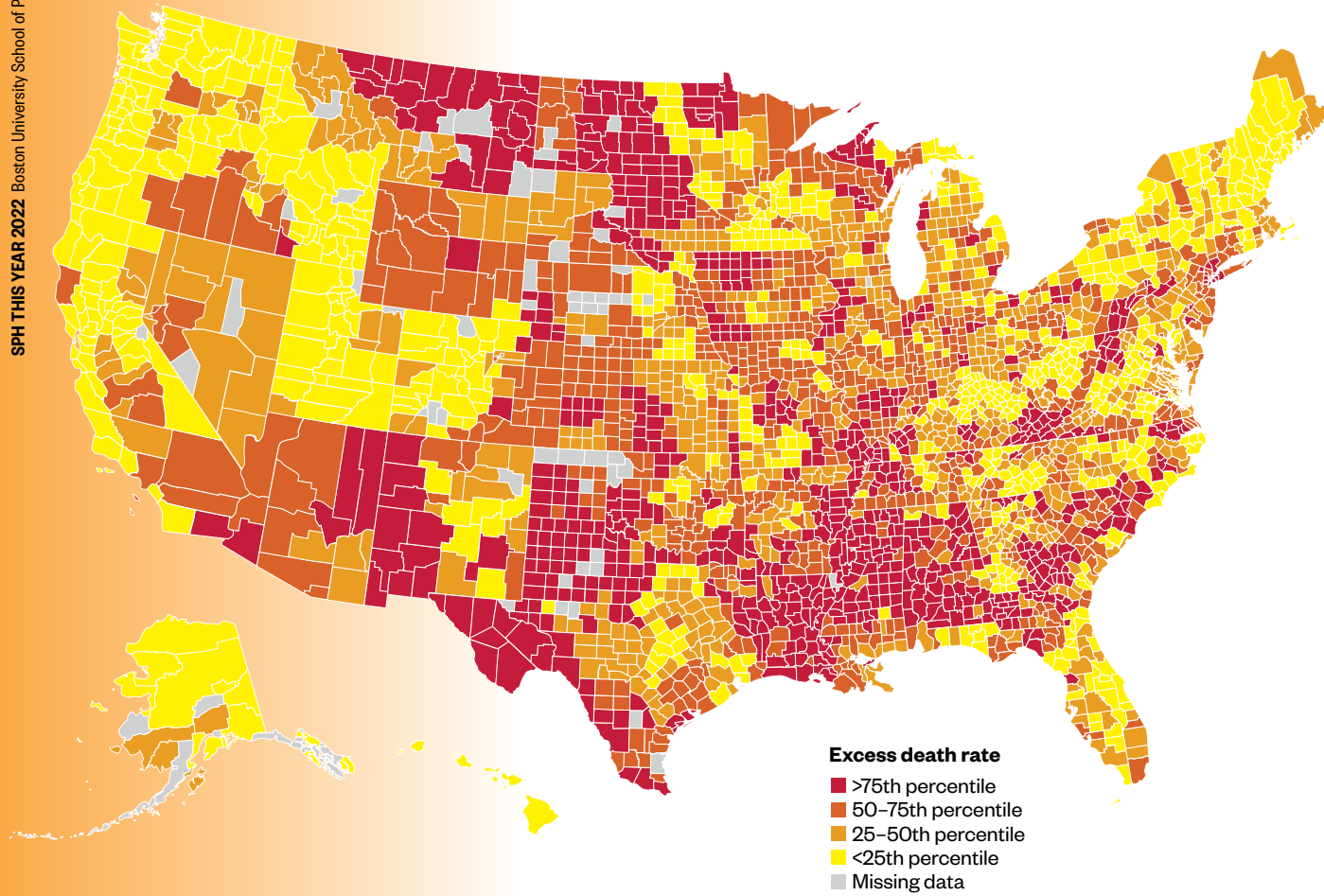
COVID-19 HIDDEN MORTALITY

AT LEAST
20%

of COVID-19 excess deaths—those exceeding normal-year projections—are unreflected in official US county death counts.

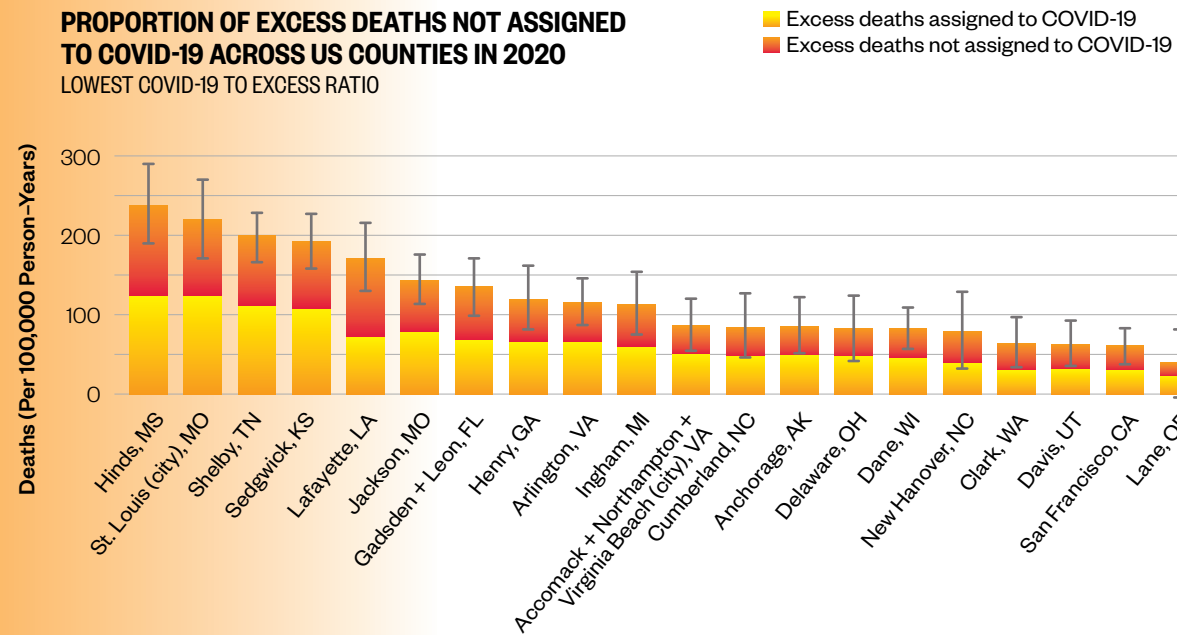
Professor teams with journalism initiative to uncover **HIDDEN DEATHS OF COVID-19**

TRUE NUMBER OF US COVID DEATHS LIKELY MUCH HIGHER THAN RECORDS INDICATE



PROPORTION OF EXCESS DEATHS NOT ASSIGNED TO COVID-19 ACROSS US COUNTIES IN 2020

LOWEST COVID-19 TO EXCESS RATIO



and expertise of local journalists, public health researchers, community organizations, medical examiners, coroners, and the general public at large, and encouraging people to participate in this initiative.

“Much of the underreporting appears to be concentrated among deaths occurring at home, where testing is extremely limited,” Stokes says. “In these cases, the cause of death is frequently assigned to other conditions such as heart disease or diabetes. Many people are afraid of going to the hospital and potentially getting COVID, or losing contact with their loved ones, so they’re getting sick and staying at home, and then dying without their death ever being reported as a COVID death.”

He adds that COVID-19 death undercounting also has political implications. Since most death investigations occur at the county level, the official cause of death is often determined by elected coroners who may be motivated by political bias to downplay the pandemic and who typically receive less formal training than medical examiners.

“Much of the underreporting appears to be concentrated among deaths occurring at home, where testing is extremely limited. In these cases, the cause of death is frequently assigned to other conditions such as heart disease or diabetes.”

Andrew Stokes, assistant professor of global health

Listen to Andrew Stokes talk with Public Health Post fellows on PHPod.



Are we ready for the
next pandemic?

INFECTIOUS DISEASES

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Infectious diseases//

PARADIGM SHIFT:

moving from a crisis-based system to prevention.

THE TOLL COVID-19 has taken on so many has been thoroughly chronicled since the start of the pandemic, with the number of those who died the saddest metric. As that number climbs steadily—the nation is now at more than a million COVID-19 deaths, a figure that is likely significantly higher based on recent SPH research—it's clear that the disease has had the largest and most visible effects where we convene: our cities, our workplaces, our recreation spaces, and our schools.

As we climb out of a third pandemic year, public health researchers have begun to document various strategies for containing and mitigating the disease that has driven so much recent inquiry and policy action. At SPH, teams of researchers collected voluminous data on workplace and municipal policies to figure out what worked and what didn't. Clinicians have studied vaccine hesitancy, mask acceptance, and other procedures that were designed to increase safety in gatherings.

BY MICHAEL SAUNDERS
ILLUSTRATIONS BY
FIEN JORISSEN



But as COVID and its variants continue, many SPH researchers have subtly shifted their focus from fighting the current pandemic to figuring out how to prevent the next one.

LEARNING FROM THE PAST, PLANNING FOR THE FUTURE

How schools of public health approach training the next generation of public health professionals in pandemic response is likely to become a critical issue in coming years. At an SPH symposium in April 2022, presenters discussed the dual problem public health educators face of applying what we learned during the past three years to the next pandemic while at the same time adapting to the shifting environment as real-time changes occur.

According to Matthew Fox (SPH'02,'07), professor of epidemiology and global health, “If we train the next generation of public health professionals the same way we’ve trained the previous generation, presumably we’re going to end up with the same response.”

One takeaway: educators may need to reassess the current public health approaches to messy, complex situations—such as pandemic response—and put greater emphasis on interdisciplinary training across multiple fields rather than adopting the current trend toward specialization.

“The overarching structure of how we train public health students is actually one of the things that made me decide to move my primary affiliation from a med school to a school of public health,” says Megan Ranney, professor of emergency medicine, Alpert Medical School, and academic dean, School of Public Health, Brown University.

BEYOND COVID

This is not just about COVID, Ranney says, even though discussions may center around preventing the next pandemic. “It’s also about preventing all of those other societal effects that have happened downstream—sometimes in the margins; sometimes as a secondary effect of the very necessary measures that we put in place to control this pandemic.”

A Stanford University study published in *The Lancet* in July 2022 found that in 2020, cases of fatal opioid overdose in California spiked 44 percent over the number of 2019 deaths, with disproportionate increases among structurally marginalized populations in many major urban areas. In Boston, Jonathan Jay, an SPH assistant professor of community health sciences, coauthored a study whose findings suggest that “the unprecedented measures implemented to mitigate the spread of COVID-19 were associated with an increase in gun violence.”

In the study, published in *The Journal of the American Medical Association* in February 2022, Jay and a team of researchers looked at 2,383 patients treated at Boston Medical Center in 2020 for “violent penetrating injury” and found that while the number of stabbings was relatively constant over the previous five years, there was a significant increase in shootings that started while Massachusetts was still under a stay-at-home advisory and before large-scale racial justice protests began. “As the pandemic abates,” the researchers wrote, “efforts at community violence prevention and intervention must be redoubled to defend communities against the epidemic of violence.”

While epidemiologists may have received much of the COVID press,

4X Anxiety and depression rates among US adults were about four times higher between April 2020 and August 2021 than they were in 2019.

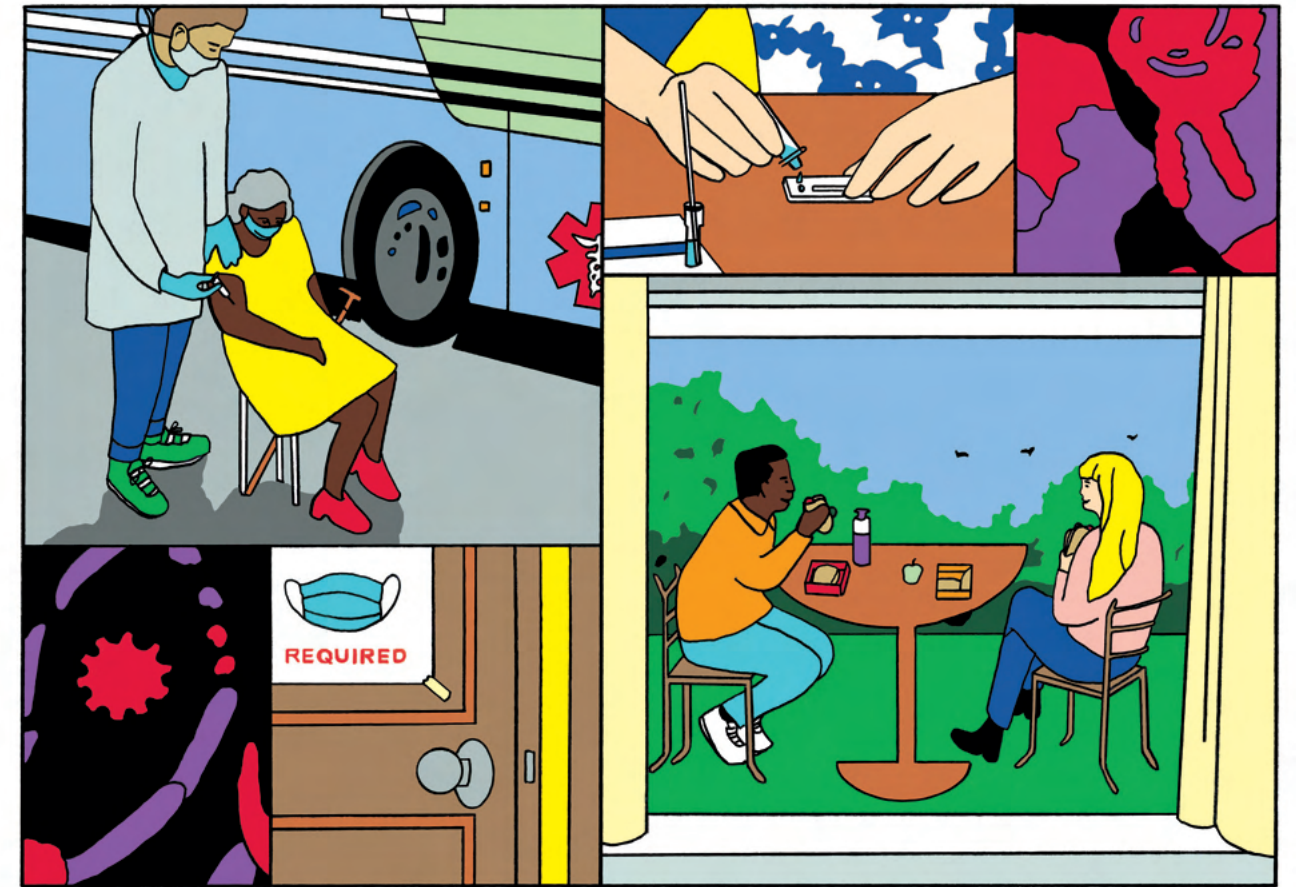
Source: Centers for Disease Control and Prevention

both positive and negative, the entire health community will likely need to be involved in all aspects of preparation and planning for the next pandemic. According to the Centers for Disease Control and Prevention (CDC), anxiety and depression rates among US adults were about four times higher between April 2020 and August 2021 than they were in 2019. The World Health Organization estimates that global prevalence of anxiety and depression increased by as much as 25 percent during the same time span.

However, at least in the US, the feared widespread increases of multiple types of self-harm, including suicide, were unrealized. “We have not seen dramatic increases in suicide rates, which I think is important to call out because there’s a popular narrative to the contrary,” Ranney says.

A future pandemic is likely to cause ripples throughout the health-care system that will extend far beyond the COVID-specific immediate care delivered to patients. COVID shutdowns stifled normal operations of many healthcare functions, including preventive screenings for numerous conditions. Throughout much of 2020 and part of 2021, healthcare providers saw declining rates of mammograms, colonoscopies, women’s reproductive health screenings, childhood vaccinations, elective surgeries, and dental care.

These gaps in healthcare must be anticipated in the policy development process before any major



closures in the future, with an eye toward improving equity. It is also important to consider the hidden populations who may be particularly at risk from policies that don’t adequately consider their needs. For example, the CDC estimates about 2.5 to 3 percent of the US population—nearly 8 million people—may be moderately to severely immunocompromised and potentially at higher risk of serious illness and hospitalization if they contract COVID-19, even if vaccinated. Any future virus may have the same effect.

CREATING BETTER PANDEMIC RESPONSE SYSTEMS

Jeffrey Shaman, professor of environmental health sciences at the Columbia University Mailman School of Public Health, hopes that developing

25% The World Health Organization estimates that global prevalence of anxiety and depression increased by as much as 25% between April 2020 and August 2021.

Source: World Health Organization

better pandemic preparedness and improving our ability to respond will include addressing issues associated with population-scale modeling analytics and forecasting.

This will require improved data collection, archiving, and sharing, as well as a commitment to better communication protocols with an emphasis on evidence-based approaches.

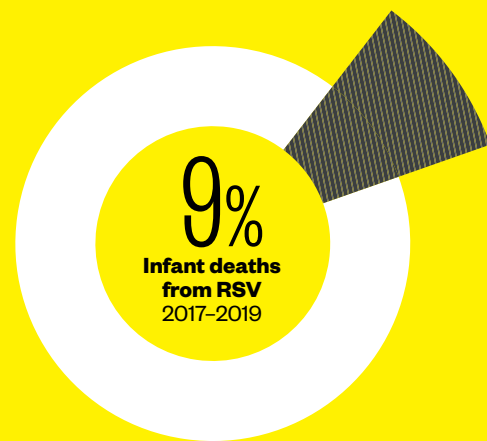
“I’ve been very heartened to see that the CDC has founded a center for forecast and outbreaks analytics,” Shaman says. “This is not a panacea. It’s not going to solve everything. It’s

an idea that’s been kicking around for nearly a decade and almost came to fruition during the Obama administration, but unfortunately didn’t. Now it has been launched with obvious impetus because of the events of the last few years.”

Shaman believes that this center and several others like it around the country—or possibly, the world—can provide the kinds of modeling analytics and forecasting that “can be used to understand at an epidemiological and population scale what makes a particular virus tick.”



RESPIRATORY SYNCYTIAL VIRUS (RSV) AS A CAUSE OF INFANT MORTALITY SUBSTANTIALLY HIGHER THAN PREVIOUSLY BELIEVED



Source: : *The Lancet Global Health*

TETRA IMAGES, LLC/ALAMY STOCK PHOTO

↑ A new study found that nearly 1 in 10 of all deceased infants under 6 months old in Zambia were infected with respiratory syncytial virus.

Infectious diseases//

A common virus with far-too-common consequences.

STARTLING FINDINGS FROM POSTMORTEM RESPIRATORY SYNCYTIAL VIRUS (RSV) SURVEILLANCE EFFORT.

A School of Public Health study found that the true burden of Respiratory Syncytial Virus (RSV) as a cause of infant mortality is substantially higher than previously believed. A common virus that produces cold-like symptoms, RSV can be fatal for infants in low- and middle-income countries where access to adequate medical care is limited.

Published in the journal *The Lancet Global Health*, the study used systematic surveillance to measure the presence of RSV among infants who died in medical facilities or in the community and found that the virus was present in 7 to 9 percent of infants under six months old and primarily concentrated in infants under three months old.

“The concentration of deaths in young infants less than three months old is important for two main reasons,” says study principal investigator Christopher Gill, professor of global health, and co-first author of the study with Lawrence Mwananyanda, adjunct research assistant professor of global health. “First, it is a reminder that these very young infants with very small airways are at particular risk of RSV infections anatomically. Second,

both of the proposed new tools to prevent RSV infections—maternal vaccinations and infant monoclonal antibodies—will be most effective immediately after birth and could wane after.”

The findings are part of the three-year Zambia Pertussis RSV Infant Mortality Estimation (ZPRIME) study conducted among infants at one of the busiest morgues in Lusaka, Zambia, the largest postmortem RSV surveillance effort of its kind and the first to directly measure RSV infant deaths in the community rather than rely on modeling estimates.

“It is a reminder that these very young infants with very small airways are at particular risk of RSV infections anatomically.”

CHRISTOPHER GILL, STUDY PRINCIPAL INVESTIGATOR AND PROFESSOR OF GLOBAL HEALTH

For the ZPRIME project, Gill and colleagues partnered with local mortuary staff to obtain consent for a nasal swab and polymerase chain reaction test of 2,286 deceased infants from families who lost a child between the ages of four days and six months.



Infectious diseases//

It's positive: good news for people of childbearing age.

WELCOME NEWS FOR THOSE TRYING TO CONCEIVE: FERTILITY IS UNAFFECTED BY COVID-19 VACCINES.



↑ During the January 22 episode of *Saturday Night Live*, *Weekend Update* coanchor Michael Che referenced a new study on COVID-19 vaccination and fertility by SPH Professors Lauren Wise and Amelia Wesselink.

Watch the clip.



GIRTS RAGELIS/ALAMY STOCK PHOTO, NBCUNIVERSAL/GETTY IMAGES

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COVID-19 vaccination in either partner does not appear to affect fertility, according to new research led by SPH investigators.

Published in the *American Journal of Epidemiology*, the prospective study of couples trying to conceive found no association between COVID-19 vaccination and fecundability—the probability of conception per menstrual cycle—in female or male partners who received the Pfizer-BioNTech, Moderna, or Johnson & Johnson vaccines.

In contrast, the findings indicate that COVID-19 infection among males may temporarily reduce fertility, an outcome that could be avoided through vaccination.

“Many reproductive-aged individuals have cited concerns about fertility as a reason for remaining unvaccinated,” says study lead author Amelia Wesselink, research assistant professor of epidemiology at SPH. “Our study shows for the first time that COVID-19 vaccination in either partner is unrelated to fertility among couples trying to conceive through intercourse. Time-to-pregnancy was very similar regardless of vaccination status.”

Wesselink and colleagues analyzed survey data on COVID-19 vaccination and infection and fecundability among female

and male participants in the SPH-based Pregnancy Study Online (PRESTO), an ongoing NIH-funded effort that enrolls women trying to conceive and follows them from preconception through six months after delivery. Participants included 2,126 women in the US and Canada who provided information on socio-demographics, lifestyle, medical factors, and characteristics of their partners from December 2020 to September 2021. The study followed participants through November 2021.

The researchers calculated the “per menstrual cycle” probability of conception using participant self-reported dates of a last menstrual period, typical menstrual cycle length, and pregnancy status. Fertility rates among female participants who received at least one dose of a vaccine were nearly identical to unvaccinated female participants, and fecundability was also similar for male partners who had received at least one dose of a COVID-19 vaccine compared with unvaccinated male participants. Additional analyses that considered the number of vaccine doses, brand of vaccine, infertility history, occupation, and geographic region also indicated no effect of vaccination on fertility.

While COVID-19 infection was not strongly associated with fertility, men who tested positive for COVID-19 within 60 days of a given cycle had reduced fertility compared to men who never tested positive, or men who tested positive at least 60 days prior. This data supports previous research that has linked COVID-19 infection in men with

“These data provide **reassuring evidence that COVID vaccination in either partner does not affect fertility among couples trying to conceive.** The prospective study design, large sample size, and geographically heterogeneous study population are study strengths.”

LAUREN WISE, STUDY SENIOR AUTHOR AND PROFESSOR OF EPIDEMIOLOGY

poor sperm quality and other reproductive dysfunction.

“These data provide reassuring evidence that COVID vaccination in either partner does not affect fertility among couples trying to conceive,” says study senior author Lauren Wise, professor of epidemiology at SPH. “The prospective study design, large sample size, and geographically heterogeneous study population are study strengths, as was our control for many variables such as age, socioeconomic status, preexisting health conditions, occupation, and stress levels.”

The new data also help quell concerns about COVID-19 vaccines and fertility that arose from anecdotal reports of females experiencing menstrual cycle changes following vaccination.

Infectious diseases//

Transmitting the message is key to preventing HIV transmission.

GLOBAL LEADERS SLOW TO PROMOTE HIV 'TREATMENT-AS-PREVENTION' IN SUB-SAHARAN AFRICA.

Ten years after a landmark trial concluded that antiretroviral therapy (ART) prevents the sexual transmission of HIV through viral suppression, significant global knowledge disparities persist about the efficacy of this “treatment as prevention” (TasP), according to a perspective paper coauthored by an SPH researcher and published in *The New England Journal of Medicine*.

The paper argues that global and national policymakers have failed to disseminate established research and messaging on the clinical and public health benefits of TasP to the public, and that this lack of clear and widespread communication may limit the effect of HIV treatment policy on population health.

“Treating HIV is among the most effective ways to prevent transmission,” writes lead author Jacob Bor, associate professor of global health and epidemiology, with senior author Kenneth Mayer of The Fenway Institute and coauthors Dorina Onoya of the University of Witwatersrand in Johannesburg, South Africa, and Bruce Richman of the Prevention Access Campaign. “Yet in many countries, TasP isn’t broadly emphasized in public

health information campaigns, HIV-education curricula, or HIV counseling.”

Along with several subsequent large-cohort studies, the HIV Prevention Trials Network 052 trial (HPTN 052) found zero risk of HIV transmission between mixed-status couples when the HIV-positive partner was on ART and virally suppressed. This breakthrough

“**Treating HIV is among the most effective ways to prevent transmission, yet in many countries, TasP isn’t broadly emphasized in public health information campaigns, HIV-education curricula, or HIV counseling.**”

JACOB BOR, STUDY LEAD AUTHOR AND ASSOCIATE PROFESSOR OF GLOBAL HEALTH AND EPIDEMIOLOGY

fueled global policy changes that placed treatment at the center of HIV prevention, with countries worldwide implementing HIV “test-and-treat” measures designed to reduce transmission. Still, policymakers have failed to inform the public of the rationale for these changes, and existing evidence from sub-Saharan Africa indicates large knowledge gaps.



ANDREW AITCHISON/LAMY STOCK PHOTO

↑ Existing evidence from sub-Saharan Africa indicates large knowledge gaps among the general public in preventing HIV transmission. Here, an African woman holds her antiretroviral medication, a government-approved treatment for HIV.

sph by the

RANKING

6

U.S. News & World Report
best
graduate schools
of public health

APPLICATION NUMBERS

3,352

total applications as of July 2022

STUDENTS

1,238

students as of July 2022

ALUMNI

11,205

alums living in

114

countries*

*Estimate as of July 2022

GRAPHIC DESIGN BY STEPHANIE TESTA; ISTOCK.COM/ILLUSTRIOUS

numbers

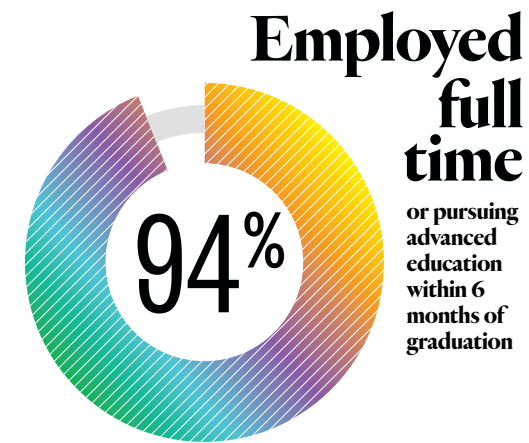
FACULTY

303

STAFF

227

2021 GRADUATE EMPLOYMENT



RESEARCH FUNDING

\$73.2M

awarded in 2022

RESEARCH AWARDS

335

MEDIA MENTIONS

4,788

this year

PEER-REVIEW PUBLICATIONS

1,841

this year

PUBLIC HEALTH CONVERSATIONS

150K+

people engaged in
Public Health Conversations

ISTOCK.COM/TONGSUR; ISTOCK.COM/MARVID

Revisit our 2022 Strategic Direction symposia that brought together more than 20,000 people from across the world.

Public Health Conversations.



Climate and Health: What can we do today?

MARCH 18, 2022



The Resilience of Cities: Where we work, live, and play

NOVEMBER 2, 2022



Mental Health and Trauma: Context and consequences

FEBRUARY 14, 2022



Towards Antiracist Academic Institutions: Next steps

SEPTEMBER 19, 2022



Preventing the Next Pandemic: Will we be prepared?

APRIL 8, 2022

DEAN AND ROBERT A. KNOX PROFESSOR

Sandro Galea

SENIOR DIRECTOR, MARKETING & COMMUNICATIONS

Cara Willis

DIRECTOR OF EDITORIAL CONTENT

Michael Saunders

SPH THIS YEAR PROJECT COORDINATOR

Kelly Culnan

WRITERS

Mallory Bersi

Teresa Wood Kett

Jillian McKoy

CONTRIBUTING WRITERS

Pamela Cooley

Gina DiGravio

George Goetz

ILLUSTRATORS

Fien Jorissen, Heart Agency

Paddy Mills, Synergy Art

PRINCIPAL DESIGNERS

Susan Prentiss

Lee Caulfield

SENIOR ASSOCIATE CREATIVE DIRECTOR

Carla Baratta

CREATIVE DIRECTOR

Robert Davison

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