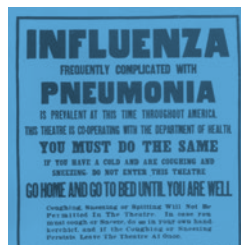
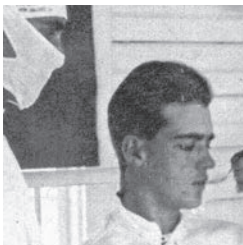


CAROLINA PUBLIC HEALTH

Gillings School of Global Public Health

The University of North Carolina at Chapel Hill

SPRING 2018 · VOLUME 3 · NUMBER 2



going viral
Impact and Implications of
The 1918 Flu Pandemic

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Cover: UNC President Edward Kidder Graham (fourth row, fifth image) died from flu-related pneumonia in 1918. He was 42.

Photo courtesy of N.C. Collection Photographic Archives, The Wilson Library, UNC-Chapel Hill (Portrait collection #P0002)

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Vol. 3, No. 2, Spring 2018

from THE DEAN



Photo by Brian Strickland

Dean Barbara K. Rimer

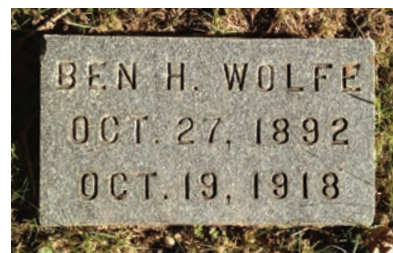
Dear readers—

This issue of the magazine features a 100th anniversary assessment of the 1918 influenza pandemic, one of the deadliest in recorded history. In April, we held a fascinating symposium, *Going Viral*, to mark the centennial.

The toll of 50 million lives is almost unimaginable. That's equivalent to the entire population of some countries, including South Korea, Argentina, Colombia or Kenya – or the total of everyone living today in Shanghai, Beijing and Bangkok. (See tinyurl.com/wiki-cities.)

Entire families were wiped out in 1918, and in some communities, nearly everyone died. Philadelphia ran out of coffins, and bodies piled up on porches. The beloved 42-year-old president of UNC-Chapel Hill, Edward Kidder Graham, died of influenza-caused pneumonia; his successor, M.H. Stacey, age 41, died of pneumonia three months later.

Thomas Wolfe was a UNC-Chapel Hill student at the time, and his brother Ben died of influenza, a loss featured poignantly in his book, *Look Homeward, Angel*. Over the 2017 winter holiday, my husband Bernard, dog Dickens and I went to Asheville, N.C., and visited the Wolfe family graves. There, we saw the small marker for Ben Wolfe and imagined what it had been like in 1918 when no part of the country, and few parts of the world, were insulated from the pandemic. Death ruled.



Although little was known then about the cause of influenza – it took decades before the viral agent was discovered – leaders made catastrophic miscalculations. For example, many advised against a parade in Philadelphia, planned to galvanize support for war bonds. City leaders persisted, and the packed

parade route contributed to the rapid spread of the disease there.

A war was going on in Europe, and the U.S. and other countries sent soldiers abroad in densely packed ships, where influenza spread like wildfire. Woodrow Wilson was president, and his contracting flu during the Paris Peace Conference caused him to miss several days of negotiations with world leaders, some others of whom also suffered from influenza.

The pandemic was a wake-up call. In its aftermath, many recognized that the U.S. needed more hospitals, physicians and nurses, more means of dealing with health emergencies, more schools of public health and more public health infrastructure. A highly competitive, vigorous effort ensued to find the cause of the virulent disease that had precipitated the pandemic. Epidemiology came into its own. Our UNC School of Public Health was the first in a public university (formally begun in 1940). Our first dean, Milton Rosenau, MD, had been involved in research to understand flu transmission in Boston.

The 1918 pandemic seemed one that could be viewed effectively only through a very wide-angle lens – thus, the symposium, *Going Viral*, and this issue of *Carolina Public Health*. Historians, experts in literature, communications experts, virologists, epidemiologists, physicians and others were needed to understand what happened and how we can prevent another catastrophic event.

We should do everything possible to assure that there is never another pandemic like the one in 1918. In this issue, read about *Going Viral* and see interviews with some of our, and the nation's, top infectious disease

researchers who discuss ways to prevent another pandemic. Experts, including Drs. Leah Devlin and David Weber, discuss strategies for prevention, treatment and limiting spread. We are fortunate that faculty members, such as Drs. Ralph Baric, Mike Cohen and Allison Aiello, study infectious diseases with the depth and urgency they deserve. Other exceptional faculty members not included here (such as Dr. Noel Brewer, professor of health behavior) are examining infectious diseases from many perspectives, including how to communicate about them.

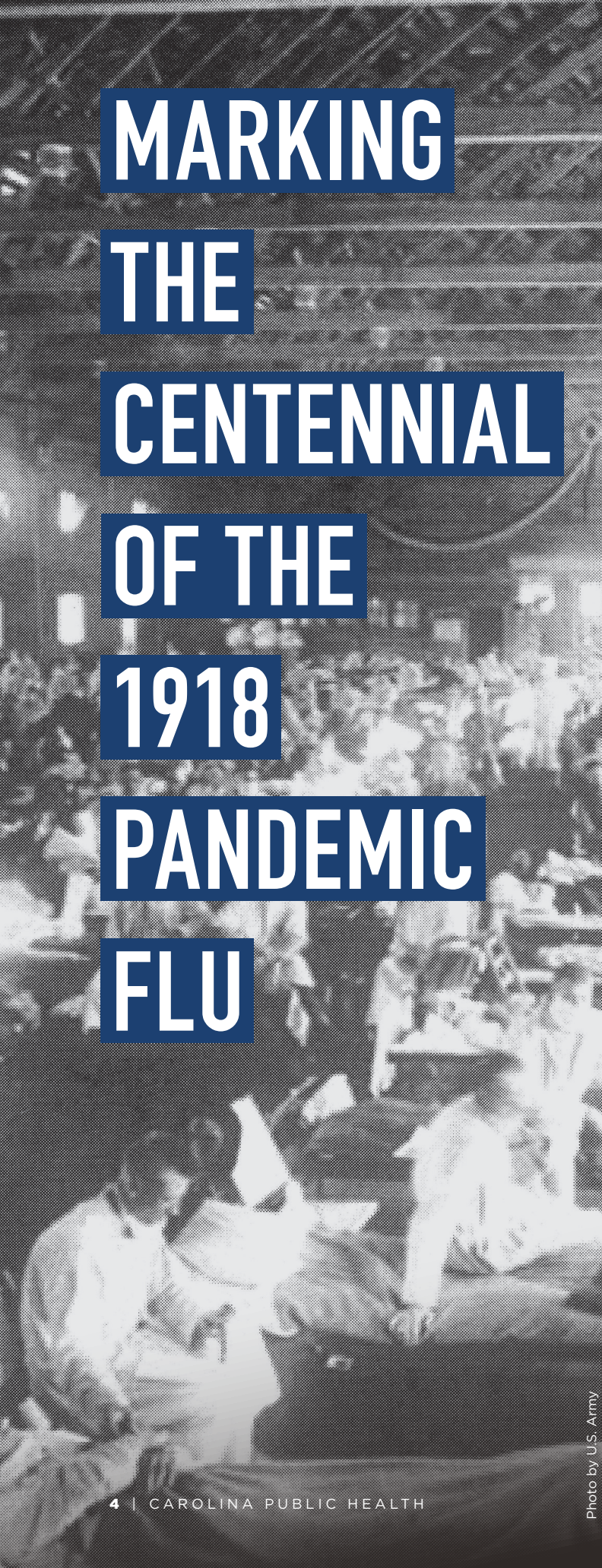
In 2016, according to the Centers for Disease Control and Prevention (CDC), only about 42 percent of U.S. adults ages 18 and older reported receiving flu vaccinations in the past year. As the 1918 pandemic showed, young adults can be especially vulnerable in a pandemic, and young adult vaccination rates are lower than for the very young and those ages 65 and older.

Except for leaders at the CDC, few are providing appropriate leadership to communicate the lifesaving value of vaccinations for influenza and other diseases. One hundred years after the 1918 pandemic, we need better communications, a universal vaccine, more effective antivirals, use of evidence to guide our policies and actions, and recognition that history can teach us a lot if we pay attention to it.

Warm regards,



Barbara K. Rimer, DrPH

A black and white photograph of a crowded hospital ward, likely during the 1918-1919 influenza pandemic. The ward is filled with soldiers lying in beds, some appearing to be resting or recovering. The room has a high ceiling with exposed pipes and a large window in the background. The overall atmosphere is one of a busy, crowded medical facility.

MARKING THE CENTENNIAL OF THE 1918 PANDEMIC FLU

A century ago, "Spanish flu" swept the United States and world in the most aggressively lethal disease outbreak in human history. Spreading fast and killing quickly, the 1918-1919 global influenza pandemic stole the lives of nearly 700,000 Americans, among them, in 12 weeks' time, two successive presidents of the University of North Carolina.

Its cause, an H1N1 flu variant of unprecedented virulence, was then beyond scientific understanding. In little more than 18 months, this flu infected half of the world's 1.5 billion people and killed 50 to 100 million. Modern demographers, citing improved pandemic mortality models, tell us that this haunting estimate, in fact, may be too low.

Unfolding against the backdrop of World War I, the pandemic – called "Spanish flu" because Spain, a noncombatant nation, took no steps to censor popular news reports of the spreading illness – may have appeared first in military camps in northern France in 1916, emerging from a mix of swine and poultry influenzas and jumping species to infect soldiers.

A first wave of pandemic sickness in early 1918 was relatively mild, but a further mutation yielded the deadly second wave in fall of that year – and another in early 1919. No corner of the world was spared, as the disease traveled handily with anyone infected.

Healthy young adults, who rarely die from common infectious diseases, became casualties, along with older adults and children. Death often was fast and terrible. Patients drowned as their lungs filled rapidly with fluid, their faces turning blue, for lack of oxygen.

Soldiers recover in the flu ward at Camp Funston, Kansas, in 1918.

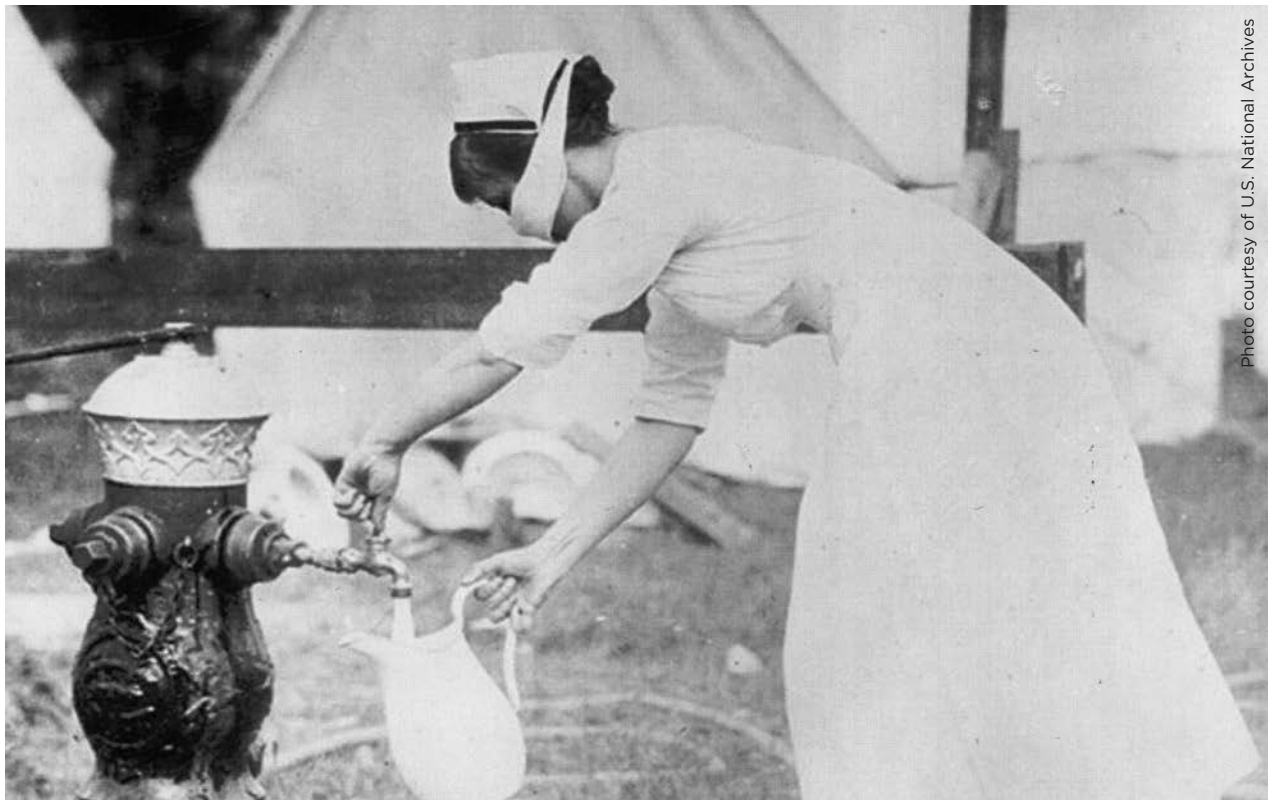


Photo courtesy of U.S. National Archives

A Red Cross nurse draws water at a military camp in Brookline, Mass., in 1918.

President Woodrow Wilson, incapacitated by flu at the Paris Peace Conference, lost his chance to assert his vision for just settlement terms among belligerents and new, supranational mechanisms, such as a League of Nations, which might ensure future world peace.

IT COULD HAPPEN AGAIN

Could a similar catastrophe happen in 2020?

Insistently and emphatically, experts say *yes*, future global infectious pandemics are a question of *when*, not *whether*.

Recent pandemic scares – Avian flu, SARS, Ebola, Zika and others – reveal terrifying limitations of our global capacity to respond quickly and effectively. Should a novel, aggressively virulent and contagious influenza variant emerge, the global community might be easily overwhelmed.

Throughout winter and early spring 2018, hospitals in the United States screened those suffering from H3N2 seasonal flu in tents erected hurriedly in their parking lots, having overrun the capacity of their emergency departments. The sobering fact is that

H3N2, though virulent, is the palest cousin of the 1918 flu. Despite these realities, our political leaders now propose sharp funding cuts to the Global Health Security Initiative. Scientists, meanwhile, continue to seek a universal flu vaccine and to develop more effective antivirals.

THE GILLINGS SCHOOL'S SYMPOSIUM

In early April, the UNC-Chapel Hill Gillings School of Global Public Health co-hosted *Going Viral: Impact and Implications of the 1918 Influenza Pandemic*, a gathering that aimed to define the “state of the science” in the study of pandemic infectious diseases, specifically influenza.

Interdisciplinary experts, some of whose comments are included in the following pages, discussed the risks, latest science and best practices to prevent, prepare for and respond to an infectious disease pandemic.

Going Viral was the product of a powerful partnership led by the Gillings School. Symposium co-sponsors included UNC's Institute for Global Health and Infectious Diseases, RTI International,



People without protective masks could not board a Seattle trolley car in 1918.

UNC Libraries and the North Carolina Museum of Natural Sciences. The efforts of the Smithsonian National Museum of Natural History will maximize public education and engagement.

“Uncontrolled infectious disease outbreaks can cost millions of lives and tens of billions of dollars,” said Barbara K. Rimer, DrPH, dean of the Gillings School. “They can move fast with modern air travel, as SARS and Ebola showed. If we have neither the means to prevent nor treat, as is sometimes the case, even in developed nations, the impact could be

”

THE 1918 FLU PANDEMIC WAS A CATAclysmic EVENT, AND THE ENTIRE WORLD WAS UPENDED BY A TERRIBLE HEALTH CRISIS.

Barbara K. Rimer, DrPH

catastrophic. This is even more true if public health infrastructure is not robust.”

Rimer noted that the responsibility of public health leaders is to minimize the potential for worst-case scenarios to occur.

“As I read about the 1918 influenza pandemic,” she says, “I realized I had never known how deadly it was, how many mistakes were made, even with what was known at the time, and how the entire world could be upended by a terrible health crisis.”

As Rimer asked questions of others, she says, she was stunned by how little even knowledgeable health professionals knew about the events surrounding 1918.

“I thought we could learn a huge amount to help us in the future by examining the 1918 influenza pandemic from an interdisciplinary perspective,” she says, “bringing to bear history, virology, literature, epidemiology, medicine and other fields to look backward with an eye to the future. The issues are intensely local and deeply global. Flu is a health concern issue that crosses all disciplines, and we were thrilled at the high levels of engagement from across our campus.”

Gina Kolata, renowned science reporter for *The New York Times* and author of the best-selling *Flu: The Story of the Great Influenza Pandemic of 1918 and the Search for the Virus that Caused It*, gave the keynote address, which also served as the 2018 Fred T. Foard Jr. Memorial Lecture.

—Joe Mosnier

LEARN MORE ABOUT THE 1918 PANDEMIC

Patients recuperate in a flu ward at a U.S. Army camp hospital in Aix-les-Bains, France, during World War I.

Photo by Corbis/National Library of Medicine

sph.unc.edu/1918flu

Read about the Gillings School's flu symposium, held April 4–6 in Chapel Hill, N.C.

tinyurl.com/WUNC-baric-on-flu

On April 4, Gillings School epidemiology professor Dr. Ralph Baric and UNC history professor Dr. James Leloudis were interviewed by WUNC's "The State of Things" about the 1918 flu pandemic.

go.unc.edu/gazette-flu-symposium

UNC's *University Gazette* posted an article to mark the centennial of the pandemic and announce the Gillings School's symposium.

influenzaarchive.org

Dr. Howard Markel, a medical historian from the University of Michigan, spoke at the Gillings School's flu symposium on April 5. Markel is co-editor-in-chief of the *Influenza Encyclopedia: A Digital Encyclopedia of the American Influenza Epidemic of 1918–1919*.

go.unc.edu/mondaymorning-flublog1

go.unc.edu/mondaymorning-flublog2

Read Dean Barbara K. Rimer's blogs about the 1918 flu and the Gillings School's symposium.

tinyurl.com/smithsonian-1918-flu

"The Next Pandemic," featured here in *Smithsonian* magazine, is an exhibit organized in collaboration between the Smithsonian National Museum of Natural History and Johns Hopkins Bloomberg School of Public Health.

sph.unc.edu/going-viral/video

See video from the Gillings School's *Going Viral* symposium.

A TIMELINE OF THE 1918 PANDEMIC

This one was different.

The 1918 influenza pandemic killed more than 50 million people around the world. The H1N1 flu virus strain, also known as 'swine flu,' targeted healthy adults and the usual flu victims – the very young, the very old and people with existing health conditions.



OCTOBER – NOVEMBER 1918

Flu Kills Millions Worldwide

As within the military camps, flu quickly kills civilians who contract pneumonia as a secondary infection. The illness triggered a massive immune response, causing the lungs to fill with fluid. Patients tended to develop cyanosis (a bluish cast to the skin) due to a lack of oxygen, and they drowned from the excess fluid in their lungs.

SEPT. 28, 1918

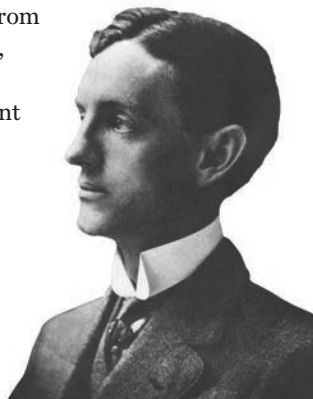
Philadelphia Holds Liberty Loan Parade

Philadelphia holds the largest parade in the city's history to raise money for the Liberty Loan campaign. Two days later, the illness was widespread throughout the city.

OCT. 26, 1918 – JAN. 21, 1919

Edward Kidder Graham and Marvin Hendrix Stacy Die

UNC President Edward Kidder Graham died from pneumonia on Oct. 26, 1918, at age 42. Stacy became acting president after Graham's death, but died from flu complications three months later at age 41.



APRIL 3, 1919

Woodrow Wilson Contracts Flu During Paris Peace Conference

Wilson's illness forced him to miss several days of negotiations. Although he recovered, many point to this illness as the beginning of a decline in his health. He died about five years later (Feb. 3, 1924), at age 67.



MARCH – AUGUST 1918

Influenza Surfaces in Numerous Military Camps Worldwide

Flu spread quickly through military training camps in the U.S. The first reported outbreak was at Camp Funston, Kansas, and it spread through military units in the U.S. and Europe. At that time, the illness was mild and did not cause much alarm.

MAY 1918

Spain's King Alfonso XIII Falls Ill With Flu

Since Spain stayed neutral during World War I and therefore did not implement wartime censorship restrictions on the press, King Alfonso XIII's illness was reported widely. This reporting resulted in the term 'Spanish flu,' although it is unlikely that the pandemic began in Spain.

AUGUST 1918

Flu Reappears in Military Camps, More Lethal Than in the Spring

People who caught pneumonia as a secondary infection to flu were the most likely to die. Some died within hours of the first symptoms. Several outbreaks of the lethal strain occurred in late June, but not until August was the problem widespread.

SEPT. 26, 1918

Military Cancels October Draft

Army Provost Marshal Enoch Crowder cancels the October draft to reduce the spread of flu in military camps.



SEPTEMBER 1918

Milton Rosenau Takes Commission in Boston

Lieutenant Commander Dr. Milton Rosenau had left his position on the Harvard faculty to serve in the Navy. In early September, he oversaw an outbreak of flu at Boston's Chelsea Naval Hospital. Navy authorities in Philadelphia took Rosenau's warnings seriously, especially given that troops from Boston were being dispatched to Philadelphia. Despite isolation of the transferred men, more than 600 became ill in Philadelphia within one week of the transfer. [John M. Barry, *The Great Influenza: The Story of the Deadliest Pandemic in History* (New York: Penguin Books, 2004).]

Rosenau came to UNC in 1936 as director of the School of Medicine's Division of Public Health. When the division became a school in 1940, he was its first dean.

DECEMBER 29, 1919

William Osler Dies

Sir William Osler, known as a pioneer of modern medicine, dies at age 70 from flu complications. Most deaths occurred in late 1918 and early 1919, but deaths continued into the early 1920s.

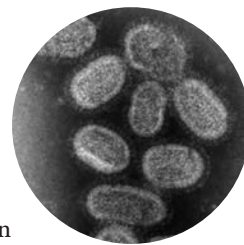


Photo courtesy of McMaster University

1933

Discovery of Human Flu Virus

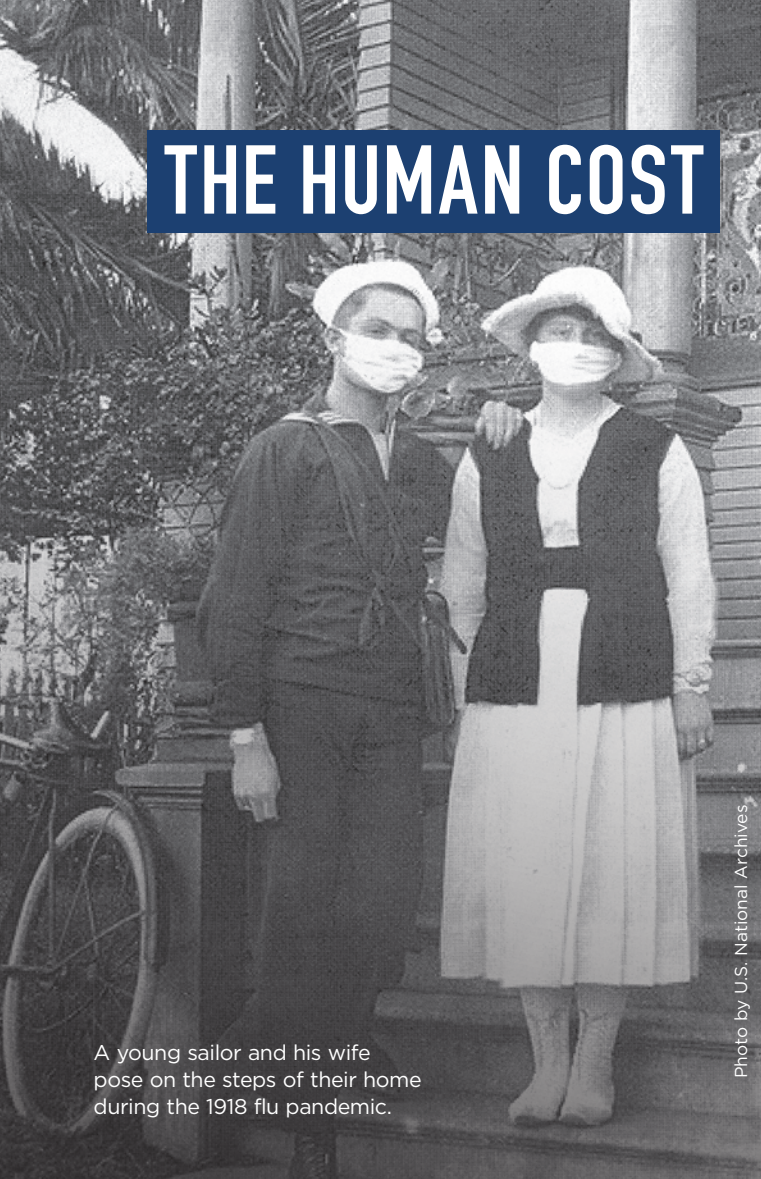
After an intense quest and competition among various individuals, National Institute for Medical Research scientists C.H. Andrewes, Patrick Laidlaw and Wilson Smith isolate the pathogen that causes human influenza. During the 1918 pandemic, the cause of flu was unknown.



Thanks to Dawne Lucas and others at the UNC Health Sciences Library for the library's online exhibit, where this timeline first appeared.

Learn more at:
go.unc.edu/HSL-flu-exhibit.

THE HUMAN COST



A young sailor and his wife pose on the steps of their home during the 1918 flu pandemic.

Photo by U.S. National Archives

Dear Mattie, You're sweet to write me every day.
The train was not so bad. I found a seat,
Watched the landscape flatten until dark,
Ate the lunch you packed, your good chess pie.
I've made a friend, a Carolina man
Who looks like Emmett Cocke, same big grin,
Square teeth. Curses hard, but he can shoot.
Sergeant calls him Pug, I don't know why.
It's hot here but we're not here for long.
Most all we do is march and shine our boots.
In the drills, they keep us 20 feet apart
On account of sickness in the camp.
In case you think to send more pie, send two.
I'll try to bring you back some French perfume.

"Dear Mattie, you're sweet to write me every day" is reprinted from Kyrie: Poems, by Ellen Bryant Voigt. Used with permission of the publisher, W.W. Norton & Co. Inc. All rights reserved.

On March 27, and again on April 7 at the N.C. Museum of Natural Sciences, students and others staged readings of poems from *Kyrie*, as part of the *Going Viral 1918 Flu Symposium*.

”

MY MOTHER TOLD STORIES OF HER FATHER, A PHYSICIAN IN CLEVELAND. WHEN THE 1918 FLU EPIDEMIC HIT, HE MADE HOUSE CALLS TO HIS PATIENTS. THE DEMAND BECAME UNRELENTING, AND AS HE BECAME INCREASINGLY EXHAUSTED, HE HIRED A DRIVER TO TAKE HIM TO PATIENTS' HOMES SO HE COULD ASSESS AND TREAT PEOPLE MORE EFFICIENTLY.

Anita Farel, DrPH, professor emeritus, Maternal and Child Health

”

MY GREAT-GRANDFATHER DIED OF THE 1918 FLU, LEAVING HIS WIDOW WITH FIVE CHILDREN, INCLUDING A NEWBORN SON (MY GRANDFATHER). THEY LIVED IN A SMALL DAIRY AND COAL-MINING TOWN IN WALES. MY GREAT-GRANDMOTHER PULLED HER THREE DAUGHTERS OUT OF SCHOOL TO WORK AS HOUSEMAIDS. HER DECISION KEPT A ROOF OVER THE FAMILY'S HEADS AND ALLOWED THE TWO BOYS TO GET AN EDUCATION AND AVOID WORKING IN THE COAL MINES.

Caitlin R. Williams, doctoral student, Maternal and Child Health

Perspectives on the Flu

Four public health experts discuss
different aspects of the threat of influenza



Ralph Baric, PhD –

In a worst-case scenario, 'there's not a lot we could do'

Q

How bad could the next pandemic be, in terms of number of people who die?

A

The 1918 flu in the United States had attack rates of 30 to 40 percent, which means it infected that proportion of people who had no prior immunity. For those infected, mortality rates were up to 3 percent. If the next flu pandemic is equally serious, then in the United States alone, more than 100 million people would be infected, and more than 3 million would die. That would be in the first wave of the pandemic – a few months. The 1918 flu had at least three waves over one year's time, starting in spring 1918.

Q

Why was the 1918 flu so deadly?

A

It was an H1N1 strain, so-called for the variants of hemagglutinin (H) protein and neuraminidase (N) protein on the viral surface, and the population hadn't been exposed to an H1 strain in a very long time. When those new hemagglutinin types come through, and people don't appreciate how dangerous they are, the mortality rates tend to go up. With 1918 flu, a combination of viral gene variants also made the flu more deadly.



Dr. Ralph Baric

Photo by Linda Kastleman



Dr. Ralph Baric (left) talks with Kendra Gully, a staff scientist in his lab.

Q | Where would you expect the next big flu pandemic to emerge?

A | Most likely, it would emerge in a dense population with open animal markets – for example, markets with chickens, ducks and geese in close proximity to people. Such environments raise the risk that a flu strain adapted to animals will adapt to infect humans, and because it will be new, we'll have little or no immunity to it.

Q | Is the U.S. health care system ready for something like this?

A | There are about 4,700 hospitals in the country. Most are set up to provide critical care to no more than 20–40 people – making the total

critical care capacity in the country on the order of hundreds of thousands of patients. However, a pandemic similar to the 1918 flu would produce millions, or even tens of millions, of critically ill people. That gives us an idea of how overwhelmed the system would be.

Q | What about antiviral drugs, such as Tamiflu?

A | The government has stockpiled anti-flu drugs, and in principle, the drugs would be administered to health care workers and some patients. Those stockpiles would be depleted rapidly, and there probably wouldn't be enough available to treat millions of patients. Also, while those drugs in clinical trials have seemed effective if given early, before symptoms appear, there haven't been trials showing that they work for people who are already seriously ill.



Photo by Jennie Sala

Dr. Timothy Sheahan wears a full-body protective suit while working in Dr. Ralph Baric's biosafety level four lab.

Q | What about the seasonal vaccine?

A | The seasonal flu vaccine is designed to be reformulated quickly to include protection against new strains. If a new pandemic strain were to emerge, we almost immediately would identify the strain and begin testing candidate vaccines against it – but that process of vaccine testing and large-scale manufacture takes months, so it's unlikely a vaccine would be available during the first wave of the pandemic.

Q | So, against a first wave of a highly virulent pandemic flu, we'd be largely defenseless?

A | A universal vaccine could protect us from future flu pandemics, but such a vaccine hasn't been developed yet. That's still probably five to 10 years away.

In a worst-case scenario, there isn't a whole lot we could do to stop a flu pandemic. It would sweep through the population, and people would die more quickly than they could be buried. Even people who weren't sick wouldn't go to work; the economy would come to a standstill. Countries would quarantine their borders, so international trade would collapse.

There would be societal upheaval. Remember, too – America is a relatively rich and well developed country. The situation would be far worse in most other parts of the world.

Q | Is it conceivable that a future pandemic flu strain could have an even higher mortality rate than the 1918 flu?

A | There are bird flu strains now that sporadically infect humans with mortality rates as high as 50 percent. Most virologists think that to be highly transmissible among humans, a flu virus can't be that virulent. Yet, if there were a highly transmissible strain with mortality rates even close to that level, then obviously, we would be talking about billions of deaths. You'd be remodeling the human population.

Ralph Baric, PhD, is professor of epidemiology at the Gillings School and professor of microbiology and immunology at the UNC School of Medicine. He studies dangerous emergent viruses, including SARS, MERS, Ebola, Zika and pandemic influenza.

—Jim Schnabel

Are hospitals prepared for the next influenza pandemic?

An interview with David Weber, MD, MPH

Q | How did you become interested in hospital preparedness and response?

A | I have always been fascinated with how and why new infectious agents emerge – like the Black Plague in the Middle Ages and the 1918 influenza pandemic – and how to control the infectious outbreaks that have devastated human populations.

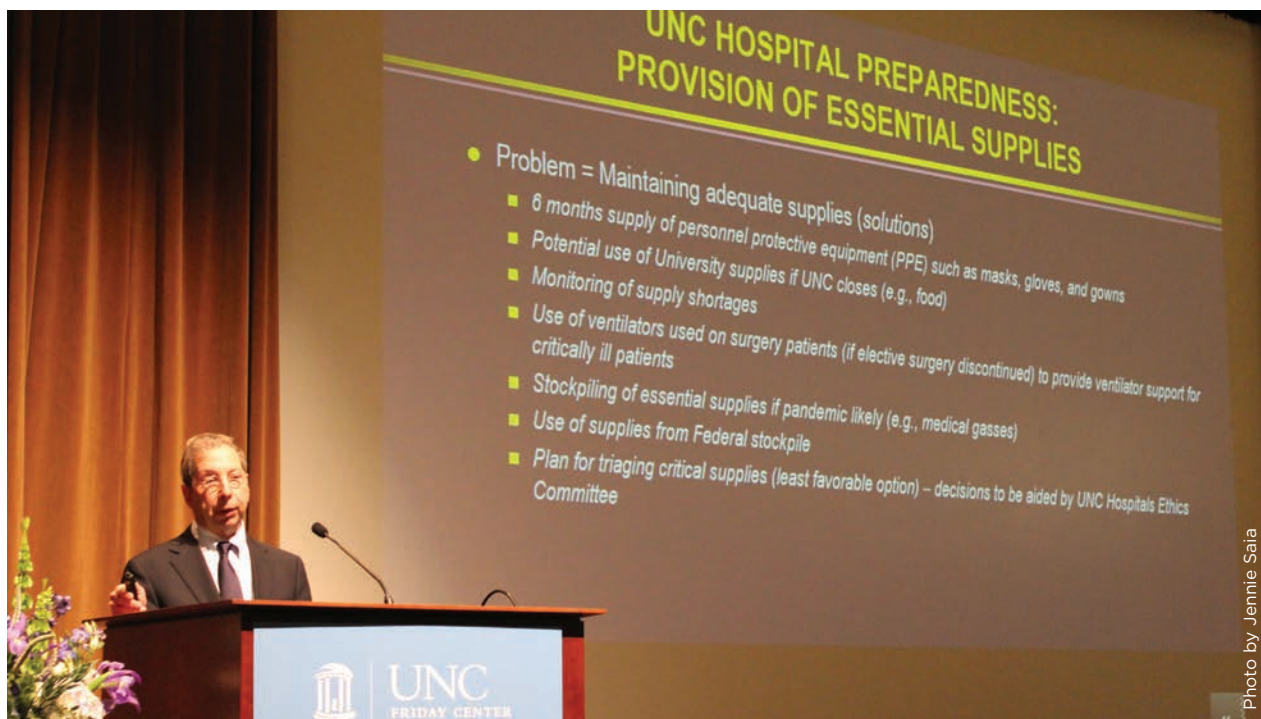
During my 33 years here at UNC, I have chaired UNC Hospitals' working groups that responded to the 2001 anthrax attack in the United States, the 2002-2003 SARS [severe acute respiratory syndrome] outbreak, the 2009 pandemic influenza, the MERS [Middle East respiratory syndrome] outbreak in the Middle East, the 2014-2016 Ebola outbreak in Africa, and Zika in the Americas.

Q | Do we know how the 1918 flu became such a killer strain?

A | Every year, influenza kills between approximately 300,000 and 650,000 people. Periodically, the virus shifts to a new strain for which humans do not have any pre-existent immunity. The 1918 flu represented such a pandemic.



Hospitals need a six-months' supply of gowns, gloves, masks and respirators to be ready for an epidemic of flu. UNC Hospitals has that available, thanks in part to Dr. David Weber's advocacy.



Dr. David Weber speaks at the Gillings School's *Going Viral* symposium on April 5.

The high number of deaths resulted from many factors – a new pandemic strain, high infectivity, high pathogenicity and rapid worldwide transmission, due, in part, to World War I, improved transportation that resulted in greater mobility, and the growth of cities.

develop a flu vaccine, but vaccine development takes at least four to six months, and we have antivirals to treat influenza, but we may exhaust the supply. As a society, we must remain vigilant and prepared.

Q | How big a problem is influenza in 2018?

A | In the U.S. alone, influenza causes between 9 million and 35 million infections per year, resulting in 140,000 - 710,000 hospitalizations and approximately 12,000 - 56,000 deaths. While people at the extremes of life (very young or very old) or with underlying co-morbidities are at the highest risk for death, even young and healthy people die of influenza.

Q | Could a pandemic on the same scale as the 1918 pandemic happen again?

A | The question is not *whether* we will experience another pandemic – but *when*. Given the global nature of transportation, a pandemic likely will spread rapidly. We have the ability to

Q | What are some best practices currently used in hospital settings?

A | Given that a flu pandemic could result in millions of people in the U.S. developing illnesses and tens of thousands dying, all health care facilities must have a well-developed plan for managing a surge of ill patients.

To do this, we need to improve outpatient facilities, dramatically increase clinics' ability to evaluate patients who may have influenza, increase the number of inpatient beds to care for patients, and increase the number of ventilators available.

We also must increase the number of health care providers available to care for patients. To achieve this, we need to move toward shifts in which health care providers work 12 hours on and 12 hours off. In a crisis, we also can recruit nursing and medical students (under the supervision of fully trained health care providers),

retired nurses and physicians, and health care providers from professional schools. For example, we could recruit pharmacists in the School of Pharmacy or nurses and physicians in the epidemiology department to provide health care to patients.

We should increase the numbers of health care personnel available for patient care by providing these personnel with prophylactic antivirals and rapidly testing health care workers who are ill so we can identify and exclude workers who might spread the flu.

We need laboratories that can develop diagnostic tests for new strains of influenza and perform large numbers of tests rapidly.

Finally, we can ensure that there is a six-months' supply of masks, respirators, gloves and gowns to protect our health care personnel, as well as food and sleeping areas for those who will be providing patient care. We have that available at UNC Hospitals.

Q

What other work must be done?

A

Despite great success in preventing infections with safe drinking water and vaccines, and treating infectious illnesses with antibiotics and anti-infectives, we continue to see outbreaks and the emergence of new infectious diseases.

For the future, we need to be developing a universal influenza vaccine; shortening the time for development of new influenza vaccines; stockpiling antivirals; and expanding public health personnel and resources.

Fortunately, new technologies will allow us to speed vaccine development, and we are already on our way to developing a universal influenza vaccine.

—Amy Strong

David Jay Weber, MD, MPH, is professor of epidemiology at the UNC Gillings School of Global Public Health, professor of medicine and pediatrics in the UNC School of Medicine, and director of hospital epidemiology (infection control) at UNC Health Care. His research has focused upon health care-associated infections, antibiotic stewardship, new and emerging diseases, and vaccine implementation.



Photo by Max England/UNC Health Care

Dr. David Weber

H

All health care facilities must have a well-developed plan for managing a surge of ill patients.

We must:



Improve outpatient facilities and increase inpatient beds;



Increase the number of health care providers and treat them with preventive antivirals;



Increase the number of laboratories that can develop diagnostic tests and perform many tests quickly.

—DR. DAVID WEBER

H

Tracking flu

Allison Aiello, PhD, studies how we share our germs

As newspaper headlines proclaimed the winter 2017–2018 flu season the most severe in nearly a decade, the research of Allison Aiello, PhD, has become more timely than ever.

Aiello, professor of epidemiology and social epidemiology program leader in the UNC Gillings School of Global Public Health, is tapping the power of social networks, technology and simple-but-effective interventions, such as hand-washing, to prevent and track transmission of flu. She also examines how policy changes can help reduce the transmission of and disparities in influenza infection.

“My research focuses on nonpharmaceutical methods for preventing flu,” Aiello says. “While the majority of flu work focuses on vaccinations and treatments, I focus on behavioral interventions which, when practiced in the event of a pandemic, may provide an effective first line of defense, especially when pharmaceuticals, such as vaccinations and antivirals, may not be available.”

Aiello's research examines social, behavioral and biological factors that have an impact upon infectious diseases and health conditions throughout life. She explores the role of social determinants – e.g., education, race/ethnicity, socioeconomic status, neighborhood-level stressors, and workplace or school policies – on health outcomes.



Evette Cordoba, MPH, epidemiology doctoral student, at left, and her mentor, Dr. Allison Aiello (right), have co-written a journal commentary about the social determinants of flu.



Dr. Allison Aiello (right) discusses the flu-tracking app with Erline Miller, epidemiology doctoral student at the Gillings School.

“Lack of access to vaccinations, neighborhood disadvantage, absence of sick-leave policies in the workplace and limited support for families during school closings are all key social determinants of influenza transmission and illness in the United States,” wrote Aiello and her mentee, Evette Cordoba, MPH, in a commentary published in the *North Carolina Medical Journal*.

“Understanding and addressing these social determinants is essential to reducing the severity of illness and curtailing future outbreaks of influenza.”

Cordoba, epidemiology doctoral student at the UNC Gillings School, and Aiello stress the impor-

tance of policy makers’ removing barriers to vaccinations and supporting equitable social policies.

Lack of access to vaccinations, neighborhood disadvantage, absence of sick-leave policies in the workplace and limited support for families during school closings are all key social determinants of influenza transmission and illness in the United States.

—DR. ALLISON AIELLO

prevented in their social networks.

Aiello says the study illuminated that interpersonal networks are important contributors to transmission of infections and behaviors.

Aiello and colleagues employ technology as an important tool to track transmission of the influenza virus. They worked with the technology company, Ethica Inc., to tailor the company's existing phone app (iEpi) for tracking college students' interpersonal interactions to determine how transmission of influenza might be

“We became very interested in being able to better characterize networks so that we could make it easier to identify transmission events,” she says.

By mapping how people interacted and how that related to their possibility of infection, and comparing self-reported interactions to those collected by sensors, the researchers realized that they were missing “a huge portion” of the interactions that occur.

“Because of that,” Aiello says, “we decided to further our work, using technologies for network data collection. We are working with an engineer at the University of California at Berkeley to implement in our studies a button-sized sensor to allow us to collect data on very, very fine interactions.”

Aiello says that she has received funding to test these sensors in the workplace and to examine the relationship of hand hygiene and infectious outcomes in nonclinical office settings.

Hand hygiene and its role in flu prevention is another recent area of research by Aiello.

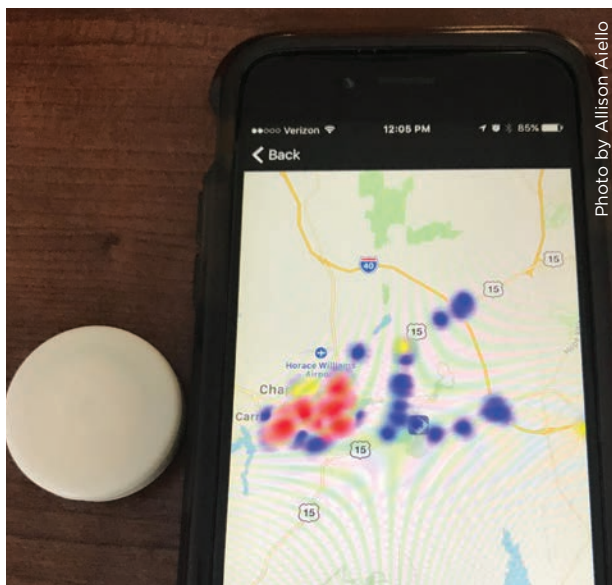
A study first-authored by Aiello's mentee Paul N. Zivich, Gillings School epidemiology doctoral student, assesses the effects of hand-washing interventions on infectious disease prevention among employees in nonclinical, office-based workplaces. An article is currently in press in the *American Journal of Infection Control*.

This work, co-authored by Aiello and UNC undergraduate Abigail Gancz, is a first-of-its-kind literature review to synthesize existing research on the topic.

The researchers included 11 studies – eight experimental, two observational and one, a simulation – and determined that hand hygiene interventions at various levels of rigor were shown to reduce respiratory and gastrointestinal illness among office employees.

“The interventions examined, such as providing easier access to hygiene products with simple instructional information on proper hand hygiene, were relatively easy to implement,” Aiello says. “That suggests that the potential cost to employers may be moderate to low.”

Aiello served as host and moderator for *The 1918 Influenza Pandemic: History, Narrative and Context* session during the Gillings School's *Going Viral: Impact and Implications of the 1918 Influenza Pandemic* symposium in April.



Shown are a beacon (left) and app that will be used in an upcoming study by Dr. Allison Aiello. Worn or placed in a pocket, the beacon works by Bluetooth ranging. The app allows researchers to log in the beacons as they interact with phones running the app, thereby identifying interactions between study participants.

Socio-economically disadvantaged populations suffered greater rates of infection and deaths during the 1918 influenza pandemic, a disparity that Aiello notes still exists in the United States.

“In general, disadvantaged neighborhoods report lower influenza vaccination coverage and also experience higher influenza-related hospitalizations and deaths,” she says.

“The *Going Viral* symposium was an important undertaking,” says Aiello. “Retrospective examinations of how epidemics were addressed in the past help highlight ways we might respond more effectively when future pandemics occur. Historical data have been especially useful for understanding the impact of nonpharmaceutical interventions for preventing the spread of flu.”

“The type of research we do, focusing on social and behavioral risk factors and interventions, will continue to be integral in the future. Populations that have access to inexpensive, simple measures to prevent flu transmission will have an added layer of protection before and after vaccination,” Aiello says.

—Michele Lynn

Lessons from another pandemic virus – HIV

An interview with Myron Cohen, MD

If the world faces another great influenza scare on the scale of the 1918 event, the response will owe a lot to the efforts of scientists who have been studying a different pandemic virus – HIV.

“The HIV/AIDS pandemic has forced us toward a set of responses that are now considered standard when we face dangerous emergent pathogens,” says Myron Cohen, MD, prominent HIV/AIDS researcher. “These include transmission, pathogenesis and the natural history of the disease – i.e., how the pathogen spreads, how it develops in the body and its course from inception to recovery.”

Among these, the highest-priority response is to understand the rules governing the spread of infection.

“Via the air? Via surfaces? Via sexual contact? Learning the rules of spread is the key to effective prevention,” Cohen says.

A century ago, learning the rules of an infectious pandemic could take much longer than the pandemic itself lasted. Even in the 1980s, when the HIV/AIDS outbreak began, the learning process remained slow.

“We needed a decade to understand the rules of HIV’s spread,” Cohen says.

Yet the experience and technical advances stemming from the fight against HIV, the most serious pandemic virus of recent history, mean that this process now can go much faster.



Photo by Anna Routh Barzin

Dr. Myron Cohen

“The velocity has increased tremendously. For this year’s severe H3N2 flu, for example, we’re learning the rules in a matter of months,” he says.

Another big lesson drawn from the HIV/AIDS experience is how to stop a pandemic virus without a vaccine.

“A broadly effective vaccine is the Holy Grail of preventive interventions,” Cohen says, “but we haven’t had that for HIV because the virus mutates so rapidly.”

What public health officials have had to fight HIV are behavior modification campaigns and, since

the late 1980s, powerful antiviral drugs. The latter are particularly important. Cohen and colleagues showed, through a major National Institutes of Health-sponsored study published in 2011, that early antiviral treatment of HIV-positive people dramatically cuts their chance of transmitting the infection.

That concept of “treatment as prevention” is central to ongoing, large-scale prevention programs around the world, and there is evidence that these programs are really working.

“HIV is being controlled now without a vaccine because we’re using the tools we do have to attack the roots of transmission,” Cohen says.

Researchers have started to think the same way about the flu virus, which also mutates rapidly. The seasonal flu vaccine, which minimally requires several months to design and manufacture, is based on flu strains that seem to be circulating at that time. Therefore, the seasonal vaccine would be unlikely to stop a fast-moving first wave of a new, pandemic flu strain.

However, taking a page from the anti-HIV playbook, physicians have begun to use anti-flu drugs

such as Tamiflu – and there are more promising competitors now in clinical trials – as preventives for healthy hospital workers. Prompted by the

severity of the 2017-2018 flu season, health care workers also have used anti-flu drugs to treat a wider range of patients who already have flu symptoms – not only to alleviate symptoms but, just as important, to reduce transmission.

“Someday, we’ll face another serious, emergent, microbial threat,” Cohen says. “However, the progress we’ve made in recent decades – to shorten the time needed to ‘learn the rules’ and respond – is, at least, inspiring.”

—Jim Schnabel

Cohen is professor of epidemiology at the UNC Gillings School of Global Public Health, director of the UNC Institute for Global Health and Infectious Diseases, Yeargan-Bate Distinguished Professor of Medicine, Microbiology and Immunology in the UNC School of Medicine, and associate vice chancellor for global health at UNC-Chapel Hill.

H —
The HIV/AIDS pandemic has forced us toward a set of responses that are now considered standard when we face dangerous emergent pathogens.

—DR. MYRON COHEN



Image courtesy of MEASURE Evaluation (measureevaluation.org)

Taking a page from the anti-HIV playbook, physicians have begun to use anti-flu drugs as a preventive for healthy hospital workers and as a way to reduce transmission in people with early flu symptoms.

PUBLIC HEALTH EXPERTS

ANSWER THE QUESTION:



How would
we handle a
pandemic flu
outbreak like
the one in 1918?





EARLY DETECTION, RAPID RESPONSE SAVE LIVES

Leah Devlin, DDS, MPH

Early detection and rapid response save lives! This is the underlying principle for handling a flu pandemic on the scale of the 1918 event and is a fundamental responsibility of the state and local health departments working with the CDC and many other partners.

Early detection and rapid response require that every county, state and the federal government implement their strong, well-rehearsed pandemic flu plans with their community partners.

First, a strong, ongoing surveillance system, supported by laboratory testing, would identify early a novel, seriously harmful influenza virus being transmitted to humans and sustained in the population. Interrupting this transmission would be essential. Therefore, isolation of ill patients and quarantine of their contacts would follow immediately.

Community strategies to interrupt transmission would include voluntary home isolation for individuals who are ill, implementation of stronger hand hygiene and respiratory etiquette, voluntary quarantine of well individuals in their homes, routine use of face masks, and closures of child-care centers and schools. Businesses would curtail their activities according to their own pandemic flu mitigation plans.

In support of the health care system, we would need to implement continual monitoring of the surge capacity needs of hospitals and deploy the Strategic

National Stockpile (see cdc.gov/stockpile) to provide Tamiflu, masks and other “countermeasures.”

We would issue health care providers additional treatment, prevention and infection control guidelines. If an effective vaccine is available, we would assess and manage its use to achieve maximum benefit, with aggressive public awareness campaigns providing outreach.

An effective risk communications effort using all types of media and hotlines would provide the public timely, accurate and complete information as the pandemic progresses, peaks and eventually wanes.

We would continue heightened surveillance so we could monitor aggressively any possible reemergence of a second wave of influenza. As the community recovers, having demonstrated its resiliency in a time of high risk and concern, we would develop an “after action” evaluation so that the collective response to protect the public’s health can be even stronger the next time we face another pandemic.

Devlin is Professor of the Practice in health policy and management at the Gillings School and a former North Carolina State Health Director.



WE CAN'T WAIT FOR AN EPIDEMIC TO HAPPEN

James Thomas, PhD

The most important thing about responding to an epidemic is not to wait for it to happen.

If a population is not prepared when an epidemic starts – especially with something as infectious and deadly as the 1918 influenza – then, the outbreak may run its full course before health workers catch up.

Although we have vaccines and medications now that weren't available in 1918, it will take months to develop a vaccine for the new pandemic strain, and antiviral medications are too expensive and short-lived to stockpile for a whole population. While we wait for the silver bullets, infection will spread.

There are things we can do to prepare for that early phase. Here are three:

- When your neighbor may be a risk to you, fear and panic can take over. The media can appeal to fear or calm it. Public health officials can build bridges with the media now to help ensure the latter.
- Those who don't speak English may miss public communications about steps to take. Some who don't speak English are undocumented and afraid of interacting with officials. We can develop means of safely providing them information and services – for their own health and to lessen the sources of infection for others.
- We cannot anticipate every challenge, and virtually every decision potentially will hurt someone. We

“If we are not prepared for an epidemic, it may run its course before we catch up.”

—DR. JAMES THOMAS

can practice on-the-ground ethical decision-making in the midst of a crisis.

In public health, we face the problem of zero. Getting case numbers low is our measure of success. Keeping them low takes sustained effort, but governments often move resources away from the low numbers. Likewise, the general public pays attention to crises rather than quietude. Our greatest challenge for the next pandemic is to prepare while the numbers are still low.

Thomas is an associate professor of epidemiology at the Gillings School and director of the Carolina Population Center's MEASURE Evaluation Project. A principal author of the American Public Health Association's "Code of Ethics," Thomas leads a global team that advances the capacity of developing countries to monitor their epidemics and evaluate their programs to control them.



OUR RESPONSE MUST BE DATA-DRIVEN

Danny Staley, MS

In 1918, little was known about viruses and too little about diseases. Surveillance equaled body counts. Today, we have more advanced ways of collecting and using data to prevent and respond to influenza outbreaks.

A key data source is active surveillance, which gives us data such as types of viruses in circulation, geographic distribution and influenza-associated deaths. Information collected locally is provided to the Centers for Disease Control and Prevention (CDC) and World Health Organization (WHO). These organizations use data to guide prevention activities and formulate vaccines.

North Carolina engages untiringly in active surveillance. Local health departments, private practitioners, colleges and universities, and hospitals submit lab specimens to the State Laboratory for Public Health. Results that are generated allow for earlier detection and targeted response of prevention activities, including vaccination clinics, clinical interventions and media campaigns.

The North Carolina Disease Event Tracking and Epidemiologic Collection Tool (NC DETECT) uses data sources, including hospital emergency departments, to monitor influenza-like illnesses. NC DETECT data allow for analysis of trends and comparisons to previous years.

Today, we have data systems and access in place to allow public health practitioners to achieve early

detection and rapid response. This is especially important in the case of a novel influenza virus. Knowing we are dealing with a novel influenza can inform our actions, perhaps directing us to deploy the Strategic National Stockpile or giving us a head start on vaccine development.

Data give us a foundation for compiling guidance documents to establish standards and protocols. Data allow us to communicate effectively about prevention and reduction in the spread of disease. Data capture the drifts and shifts in viruses, allowing us to be agile in devising prevention and treatment strategies.

Our response to a modern-day pandemic of flu? It should – and must – be data-driven.

Staley has served as director of North Carolina's Division of Public Health since 2015. Past president of the N.C. Association of Local Health Directors, he has presented to legislative committees on various public health challenges, including obesity, tobacco use prevention and public health infrastructure.



COMMUNICATION WILL PLAY A CRITICAL ROLE

Bridget Kelly, PhD

During the 1918 flu pandemic, the communication environment was simpler. There were no text-message alert systems, no internet for Googling symptoms, no 24-hour news cycle. In some states, mail carriers delivered the latest educational materials about the outbreak.

While medical and scientific advances may save us from enduring again the severity of the 1918 pandemic, communication could play a critical role in reducing transmission. The speed with which we can reach mass audiences will lessen the pandemic's impact, but we also have learned a lot about what works and what doesn't in communication during outbreaks.

The most brilliantly crafted public health messages can help only if they reach their target audiences, and no message will be effective if it conflicts with people's beliefs. Advance research to better understand belief systems of the different audience segments can maximize a message's potential. For example, understanding the beliefs of those resistant to vaccines could help to prevent the hampering of vaccination efforts when a pandemic occurs.

The Centers for Disease Control and Prevention has published extensive guidelines on crisis and emergency risk communication. These include:

- Instill trust by communicating early, often and as transparently as possible.
- Communicate uncertainty by preparing the audience for the likelihood that information will change as new facts are learned.

We also have learned how to develop more accessible communication products, factoring in literacy, health literacy and cultural appropriateness. See plainlanguage.gov and the CDC Clear Communication Index (cdc.gov/ccindex/index.html).

In applying these lessons, we must remember that the public's attention to issues in the news is ephemeral. If people hear too much hyperbole at the start of an outbreak, we can lose them before that critical time when we most need them to pay attention.

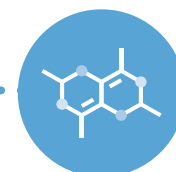
Battling misinformation is a challenge. Social media potentially can be used for stigmatization, conspiracy theories and proliferation of myths. This unfortunate situation warrants careful media-monitoring during epidemics.

We do not know when, or from where, the next pandemic will arise. When it does, we must apply lessons learned from past epidemics to plan our most effective communication efforts.

Kelly is a health communication research scientist at RTI International, where she is program manager for RTI's Science in the Public Sphere program. Kelly studies communication processes during infectious disease outbreaks and has worked on projects involving H1N1 influenza, Zika virus, Ebola and preparedness for pandemic flu.

Research, Innovation and Global Solutions

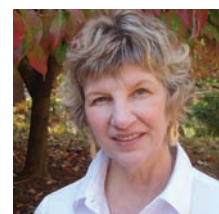
RESEARCH



Message from the Associate Dean for Research

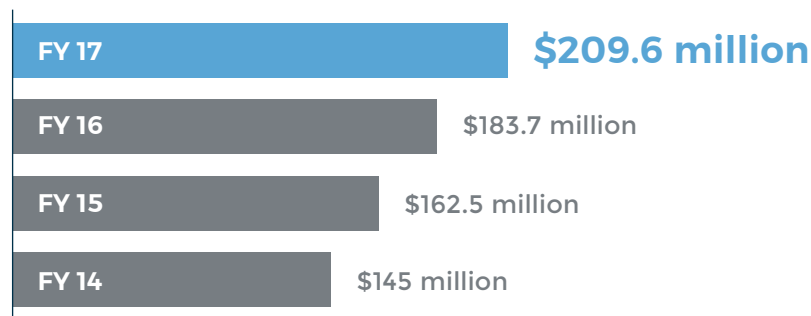
Gillings School researchers discover new insights about causes and consequences of health threats and conditions, accelerating the pace of progress, enhancing public health practice and policy, and improving the quality of people's lives.

Learn more about our research priorities at sph.unc.edu/research/explore.



Sandra Martin, PhD
Professor of maternal
and child health

Total Research Funding by Year



NIH ranking

Public school
of public health
(#4 overall)

INNOVATION

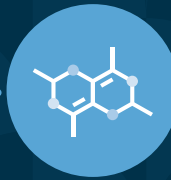


Message from the Managing Director

In the ten years following the Gillings Gift, members of the Gillings School community have taken bold but pragmatic chances in new areas, with new partners, to solve problems in innovative and groundbreaking ways. The gift has funded exciting programs, which have expanded our culture of innovation and entrepreneurship. *The results?* Accelerated impact and a commitment to achieve even more.



Julie MacMillan, MPH



Our Programs That Drive Change



Gillings Innovation Labs (GILs)

Ambitious, rigorous, interdisciplinary, local and global, the GILs offer fresh ideas and new solutions – and often result in new entrepreneurial activity. Dr. Ralph Baric (see page 12) was awarded one of the first GILs. To date, we've funded 31. (See sph.unc.edu/awarded-GILs.)



Innovation Made Fundamental

Resources such as our entrepreneur in residence, student training and connections to partners across North Carolina and around the world are the foundation for our culture of innovation.

Impact and Passion To Do More



\$7.1M investment from Gillings Gift funded **31 GILs**.

The impact?

New research solutions and a **7-fold (\$53M) return** on financial investment.

New Businesses and Social Ventures

The Gillings School's programs and lab funding helped stimulate a culture of innovation, which has encouraged entrepreneurship and led to new ventures. Here are a few such ventures, launched by faculty members or students:



Aquagenx

Portable water quality testing products for use in low-resource environments

Counter Tools

Technology tools, training and technical assistance to those who enact and enforce public health policy, systems and interventions

Real Talk

Using technology to improve teens' reproductive health education

Seal the Seasons

Partnering with local farmers to collect, freeze and distribute fresh produce

Carpe

An antiperspirant lotion for hands and feet

mAdapt

An app to address the reproductive health needs of women refugees

Healthy Girls Save the World

Encouraging healthy lifestyles for girls in middle school

GLOBAL HEALTH



Message from the Associate Dean for Global Health

At the Gillings School, global health is local health. We support students, faculty and staff members to work on problems and solutions that will have impact in North Carolina and around the world.

Learn more about our work at sph.unc.edu/global.



Margaret Bentley, PhD
Carla Smith Chamblee
Professor of Global
Nutrition



Student research and practica are an essential part of the Gillings School's global presence. These opportunities allow students to obtain hands-on experience, cultivate skills necessary to be leaders in their fields and make meaningful contributions to advancements in global public health.

In 2017-2018, at least 40 students completed a global practicum. Read about some of their projects at go.unc.edu/Gillings-global-practica.



Dr. Laura Linnan (left) works with new core team member and master's student Varsha Subramanyam.

Photo by Linda Kastleman

THE GILLINGS SCHOOL

► PREPARING THE
21st-century public health workforce

Today, public health education is changing more than it has in decades.

Gillings School leaders were beginning to plan for changes in the School's academic programs when the Council on Education in Public Health (CEPH), the School's largest accreditor, issued new criteria for the accreditation of schools and programs of public health in November 2016.

The changes are profound and affect all degrees. Leaders at the Gillings School and others are making dramatic changes in how educational programs are organized and training occurs. For example, we are revising the Master of Public Health (MPH) degree to be more practice-based and focused on applying foundational knowledge and skills to current and emerging public health issues. Recognizing that all students need certain foundational skills, the Gillings School has transitioned from separate, stand-alone core courses to an integrated one – and to concentration areas that either may be within traditional departments or across departments.

Knowing that new criteria were imminent, and that it was time to change, leaders at the Gillings School were committed to change with excellence, intelligence, integrity and intention. The multi-year planning process has yielded a new core course sequence and set of concentrations consistent with national guidelines and the wisdom of the Gillings School's key stakeholders. Some concentrations align with departments, such as "Health Policy," and others, such as "Global Health" and "Health Equity, Social Justice and Human Rights," cross departmental boundaries. The new 12-credit integrated core course sequence will be rolled out in fall 2018.



A student takes advantage of the welcoming study spaces in the Gillings School's Armfield Atrium.

Having focused first on the MPH program, School leaders next will begin to address baccalaureate and doctoral programs.

"Our students are passionate about making change in the world, and the new core will engage students immediately to understand and solve big, timely, real-world problems," says Elizabeth French, MA, assistant dean for strategic initiatives at the Gillings School. "When students finish the integrated core courses, they will have a shared vocabulary, a sophisticated set of tools, and leadership skills for their future careers."

Varsha Subramanyam, a second-year MPH student in health behavior who worked with the team that



When students finish the integrated core courses, they will have a shared vocabulary, a sophisticated set

of tools and leadership skills for their future careers.

—Elizabeth French, MA



The fully renovated Joan H. Gillings Auditorium provides students with a comfortable learning environment and state-of-the-art technology.

developed the new core courses, is enthusiastic about the new core curriculum.

“It’s an interdisciplinary curriculum that brings together students from across the School to get the foundational concepts of public health before they move into their concentration focus,” Subramanyam says.

Throughout the integrated core classes, practitioners and alumni will give guest lectures in the classroom, work with student teams, and serve as mentors on assignments. Beginning in fall 2019, students may choose from 11 MPH degree concentration areas, including applied epidemiology; environmental health solutions; global health; health behavior; health equity, social justice and human rights; health policy; leadership in practice; maternal, child and family health; nutrition; population health for clinicians; and public health data science.

“We had a fully engaged discussion among our current students, faculty, alumni, staff, employers and practice-based partners to explore training needs for the next generation of public health

professionals,” says Laura Linnan, ScD, professor of health behavior and senior associate dean for academic and student affairs at the Gillings School. “We have redesigned our MPH curriculum to ensure that



We have redesigned our MPH curriculum to ensure that Gillings School students receive the best training

for using available information and data to understand and solve complex public health issues.

—Laura Linnan, ScD



We want to expand access to our highly innovative MPH degree to mid-career professionals

and others who can't leave their jobs but want to pursue world-class training with a part-time online option.

—**Todd Nicolet, PhD**

Gillings School students receive the best training for using available information and data to understand and solve complex public health issues.”

Linnan says School leaders want to ensure that students are fully prepared with the skills, experience and capacity to lead successful data-driven public health programs and policies.

“Gillings School graduates will continue to be great practitioners,” she says, “and that emphasis and commitment to practice connects the School’s past and future.”

In parallel to changes in the residential MPH program, new online MPH programs will be offered.

“We want to expand access to our highly innovative MPH degree to mid-career professionals and others who can’t leave their jobs but want to pursue world-class training with a part-time online option,” says Todd Nicolet, PhD, vice dean at the Gillings School. “Partnering with 2U – a company that specializes in digital education – will allow us to harness the full power of the internet and integrated technologies as we implement our new MPH degree.”



These amazing practical idealists will graduate, having received exceptional training,

prepared to take their passion for public health and solve complex problems with skill, confidence and leadership.

—**Barbara K. Rimer, DrPH**

The first cohort of students in the online “MPH@UNC” will begin in fall 2018.

“We are transforming our academic programs to meet 21st-century public health needs,” says Barbara K. Rimer, DrPH, dean of the Gillings School. “We will teach using best practices, and students will have the opportunity for interdisciplinary experiences – taught, guided and mentored by Gillings School faculty members, who are among the best in the world.”

Even while they are students, those at the Gillings School will begin to solve some of public health’s greatest threats and challenges, using 21st-century tools.

“These amazing practical idealists will graduate, having received exceptional training, prepared to take their passion for public health and solve complex problems with skill, confidence and leadership,” Rimer says. “This is what people at the Gillings School always have done remarkably well.”

—*Michele Lynn*

Learn more at sph.unc.edu/mph.



Beginning fall 2019, Gillings School students may choose from 11 MPH degree concentration areas:

- ▶ APPLIED EPIDEMIOLOGY
- ▶ ENVIRONMENTAL HEALTH SOLUTIONS
- ▶ GLOBAL HEALTH
- ▶ HEALTH BEHAVIOR
- ▶ HEALTH EQUITY, SOCIAL JUSTICE AND HUMAN RIGHTS
- ▶ HEALTH POLICY
- ▶ LEADERSHIP IN PRACTICE
- ▶ MATERNAL, CHILD AND FAMILY HEALTH
- ▶ NUTRITION
- ▶ POPULATION HEALTH FOR CLINICIANS
- ▶ PUBLIC HEALTH DATA SCIENCE



TRAJECTORIES



Young alumni from all eight academic units at the UNC Gillings School prove themselves as local and global health leaders



REBECCA BARTLETT

STRONG ADVOCATE FOR MOTHERS AND CHILDREN



Rebecca Bartlett

A NEWSPAPER STORY about the capsizing of a boat carrying refugees in the Mediterranean Sea helped change the course of Rebecca Bartlett's life. Among the victims was an Eritrean woman who drowned while giving birth. Days later, when divers pulled the bodies from the water, mother and son were still joined by the umbilical cord.

"This story both breaks my heart and emboldens it," says Bartlett. "I have waited too long for someone else to start fixing the problems experienced by women and girl refugees. I have a solution, and I won't wait any longer to share it."

That solution is Shifra, a web app that connects refugees to high-quality sexual and reproductive health

IN THE BIBLE, SHIFRA WAS A MIDWIFE WHO DEFIED PHARAOH'S DECREE TO KILL ALL NEWBORN HEBREW BOYS IN EGYPT.

information that is local, effective and in a language they understand. Bartlett – an Australian who lives in Melbourne – began working on the mobile solution while studying for her Master of Public Health degree at the Gillings School.

By the end of 2018, Shifra will be accessible to the five largest non-English-speaking populations in the Australian state of Victoria.

"We will be national by the end of 2019 and global in 2022," says Bartlett. "This will help us reach millions of women who experience the dangers associated with being a displaced woman or girl."

Bartlett says that Gillings School staff were supportive of Shifra from the beginning.

"Professor [Lewis] Margolis, Jen Cole [director of career development in the Gillings School's maternal and child health department] and Naya Villarreal [program coordinator in the School's Research, Innovation and Global Solutions unit] have been great advocates of my work and have connected me to many public health students interested in coming to work on Shifra as part of their summer practica," she says.

A registered nurse-midwife who recently began a doctoral program at Australia's Monash University, Bartlett also works for Birth for Humankind, an organization that helps pregnant, economically disadvantaged women access free birth support services.

"In all my work, I try to focus on reducing the health disparities experienced by women navigating pregnancy, childbirth and early childhood," Bartlett says.

—Michele Lynn

TAYLOR EDMONDS

BUILDING BRIDGES TO GUATEMALA

IN 2014, Taylor Edmonds earned a Master of Science degree in Environmental Engineering (MSEE). Now, she builds bridges.

The bridges are metaphorical ones, mind you – such as the one between a Guatemalan community in need and American organizations that get things done. As director of the engineering projects department for Asociación Civil La Libertad ALAS (*lalibertad.org*), Edmonds spent two-and-a-half years in Guatemala, much of it seeking out projects that would bring sustainable engineering solutions to rural Guatemalans' water, sanitation, hygiene, education and health needs.

Edmonds volunteered with Engineers Without Borders (*ewb-usa.org*) throughout her school years, including a week on an assessment trip in Guatemala. She loved it so much that she returned two months later to work alongside volunteers from other nonprofits.

Her job was to visit the 38 villages near her rural dwelling and determine, with community members, public health projects that would make lives better. So far, she has worked with Engineers Without Borders on a project to bring potable water to more than 300 members of the community of Calante, who walk more than an hour to collect water during dry season.

With a group called Bridges to Prosperity (*bridgestoprosperty.org*), Edmonds works to build

pedestrian bridges that allow villagers to cross flooded rivers during rainy season. Currently, community workers must walk up to two hours to reach their fields or take cattle to market. Edmonds also partners with two Rotary clubs to build and improve rural schools.

"I was in Guatemala for a week as a volunteer, and I couldn't get the place or people out of my head," she says. "It completely changed my life."

Working on her thesis project prepared her for this kind of work, she says, because it forced her to look at problems differently.

"The strategy and process I learned in doing the thesis," Edmonds says, "helped me figure out what to do, how to do it and who to partner with along the way, all of which I need in my work now."

—Janine Latus



Taylor Edmonds (standing) interviews community members in Guatemala to determine their water and health needs.

AARON FLEISCHAUER

CONFRONTING THE OPIOID CRISIS IN NORTH CAROLINA

CAPT. AARON FLEISCHAUER earned his doctorate in epidemiology at the Gillings School in 2002, and began working for the Centers for Disease Control and Prevention (CDC) soon after. The CDC has deployed him across the U.S. to control outbreaks of West Nile virus, SARS, Monkeypox and avian influenza (H5N1).

Now, he is fighting his battles here at home in North Carolina, searching for solutions to the state's raging epidemic of opioid addiction as chief science officer of the epidemiology section at the North Carolina Division of Public Health.

Overdose deaths in N.C. are up 2,000 percent in the past five years, he says. Heroin is the biggest problem, but in Appalachia, people are even injecting methamphetamine, which usually is taken orally.

"On top of the damage the drugs do," Fleischauer says, "there's another critical public health problem. Any time you put a needle in your arm, you're risking infection."



The prevalence of Hepatitis C in North Carolina is "through the roof," he says. On the bright side, North Carolina has taken the lead in trying to reduce harm, including the provision of safe syringes and education about how to inject safely.

In collaboration with the UNC School of Medicine, Fleischauer also is studying the correlation between injection drug use and heart infections.

His training at the Gillings School prepared him to transition easily from academic epidemiology to boots-on-the-ground work with infectious diseases.

"The Gillings School was amazing at teaching the fundamentals of methodology," he says. "Once a person grasps epidemiology methods, he or she can investigate any risk factor or outcome."

For the past decade, Fleischauer has continued the Gillings School's training tradition as an adjunct faculty member in epidemiology at the School. He also is helping to build a collaboration between the School and the N.C. health department, a venture he sees as a win-win situation. Academics can immerse themselves in applied work, while the health department will draw upon academic expertise to develop practica for students and advanced training for health department staff.

"This is the activity," Fleischauer says, "that I'm most excited about – creating mentorships that will train the next generation of epidemiologists."

—Janine Latus

CHARLA HODGES

WORKING FOR EVERYONE'S HEALTH

CHARLA HODGES is excited about her work as a food environment consultant and senior project director at Counter Tools, a consulting group based in Carrboro, N.C.

The organization, co-founded in 2012 by Kurt Ribisl, PhD, professor and chair of the Gillings School's Department of Health Behavior, and health behavior alumna Allison Myers, PhD, now board member and executive director, respectively, aims to provide tools, training and technical assistance to public health practitioners and researchers across 18 U.S. states.

As project director, Hodges helps clients and partners collect and share data to inform policy change. She works particularly with the Minnesota Department of Health to assess potential policy options and interventions for tobacco and food at the local level in that state.

"At Counter Tools, we work with communities to obtain data they need to make informed decisions," Hodges says. "We help by trouble-shooting and setting up a data process so that all the information community leaders need is online in one place."

Hodges says communities may want to look at data about tobacco, food or alcohol.

"The cool thing is," she says, "the information we collect within a community isn't available anywhere else."

In 2014-2015, Hodges completed the dual master's degree program that combines health behavior (in the Gillings School) with city and regional planning (in the College of Arts and Sciences). Hodges says having both degrees allows her to see her work through two lenses.

"If I speak to a client about planning and policy approaches related to the introduction of a food retailer



Photo by Judith Winkler

Charla Hodges

initiative, I can look at benefits and drawbacks from both perspectives."

A native of Asheboro, N.C., Hodges has worked in the public health arena for several years. She began as a campus wellness educator while completing a bachelor's degree in health education and promotion at East Carolina University. That was followed by three years with Carolina's Alliance of AIDS Services, where she provided HIV risk-reduction education and conducted rapid HIV testing and HIV-prevention education at nightclubs and community events.

All of her most impassioned work – including co-chairing the Gillings School's 2014 Minority Health Conference – is aimed at eliminating health inequities. That's another reason Counter Tools is a great place for her to be.

—Judith Winkler



ERIK KARLSSON

LEARNING HOW POOR NUTRITION INCREASES SUSCEPTIBILITY TO FLU

Photo © Institut Pasteur du Cambodge/Dominique Tardy



Dr. Erik Karlsson (left) talks with colleague Songha Tok at a poultry market in Phnom Penh, Cambodia.

ERIK KARLSSON, PHD, is celebrating the 100th anniversary of the 1918 flu epidemic by studying the correlation between flu and nutrition around the world.

Karlsson, who earned a doctorate in nutrition from the Gillings School of Global Public Health in 2010, worked as a postdoctoral fellow and staff scientist at St. Jude Children's Research Hospital, studying influenza and the ways people who are obese respond to the flu vaccination. While at St. Jude, he also conducted infectious disease surveillance, focusing on influenza in animals and humans in South America, particularly in Chile and Colombia.

In 2017, Karlsson moved to Cambodia, where he now serves as senior research fellow in charge of respiratory

virus research at Institut Pasteur du Cambodge. He studies seasonal human influenza, especially in children, and avian influenza, an endemic problem in Southeast Asia.

Cambodia is a rich environment for his studies. The ongoing transition to a western-style diet has led to massive increases in obesity, diabetes and coronary heart disease throughout Southeast Asia.

"Asia is now facing a double burden of poor nutrition," Karlsson says, "where wasting, stunting and micronutrient deficiencies exist side-by-side with overweight and obesity."

Those nutritional changes can have a profound impact on immunity. Poor nutrition – whether from too few or too many calories – can increase susceptibility to and severity of flu infection. Conversely, infection can cause nutrition imbalance in people who are sick, leading to a vicious cycle.

Karlsson says his training at the Gillings School not only included nutritional biochemistry and immunology, but also epidemiology, intervention and policy.

"Dr. Melinda Beck encouraged me to think of my research in global public health terms while answering every question rigorously, methodically and with focus," Karlsson says. "These skills have given me the perspective and capability to translate my research from the laboratory bench to the clinical bedside and even to government-level policy."

—Janine Latus

CAMILLE MORGAN

ENJOYING HER WORK IN PUBLIC HEALTH LED HER TO ACQUIRE A VERSATILE SET OF SKILLS

CAMILLE MORGAN, who earned a Bachelor of Science in Public Health in biostatistics in 2015, spent her first college summer working to improve water access in Bolivia. Eager to do more, she began working during her sophomore year at the UNC Water Institute. It was a rough year. She had no experience managing a database or analyzing data, and she considered quitting – but rather than abandon public health, she dove into the biostatistics program.

“I wanted to develop a skill set so I could analyze questions in public health research, whether in water, sanitation and hygiene, or diseases,” she says. “Having good research skills was important to me.”

Morgan, a Morehead-Cain Scholar, was back in the field the following summer, developing a survey and collecting data on water packet purifiers in two regions of Malawi.

After graduation, she pursued a fellowship at the National Cancer Institute’s Center for Global Health, improving her analytical skills and learning how funding decisions shape research. Realizing that having a knowledge of medicine was important for epidemiology research, she added pre-med night classes, including organic chemistry.

“No matter how difficult people say pre-med is, it was nothing compared to some of my undergraduate biostatistics classes,” she says. “Those really prepared me to work hard and set priorities for what I needed to get done.”

Morgan completed her pre-med coursework and took a job in Johns Hopkins University’s Department of International Health. This fall, she begins a Doctor

of Medicine/Doctor of Philosophy program at UNC-Chapel Hill.

“UNC welcomes medical students who also want to complete a doctorate in public health,” she says. “The schools of medicine and public health work well together, and I knew that UNC would be a really good fit for me.”

—Janine Latus



Camille Morgan checks a borehole in a Malawi village in 2015. Boreholes, deep narrow holes in the ground, produce water that is cleaner and safer to drink than surface water.

Contributed photo

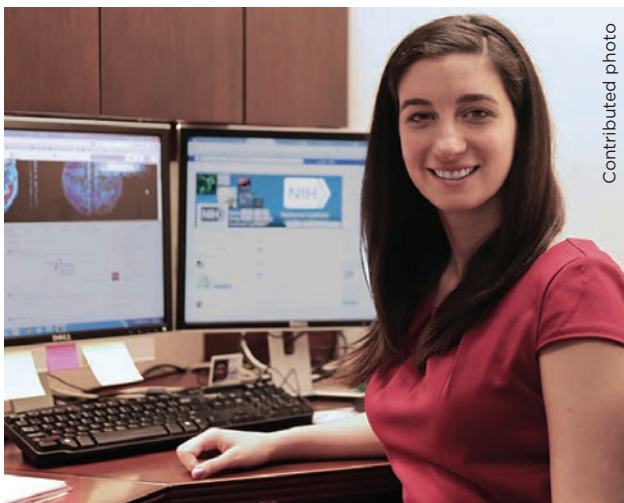
SARA CROCOLL SMITH

THINKING OUTSIDE THE BOX FOR BETTER PUBLIC HEALTH COMMUNICATIONS

“THE INTERSECTION of fiction and public health is a fascinating one,” says Sara Crocoll Smith, MPH, when asked to explain why she wrote a master’s thesis on the science behind fictional zombie outbreaks. “Sure, I was caught up in the zombie craze along with everyone else, but I wanted to take the science a step further.”

Smith, who obtained first a field epidemiology certificate and then a Master of Public Health in leadership from the Gillings School, served as a logistics readiness officer in the United States Air Force while completing her studies.

“My time in the Air Force offered an invaluable lesson in how to be a leader, yet I longed to further my knowledge of science and health,” she recalls. “Officers in the military are encouraged to obtain graduate degrees, and I jumped at the chance to pursue more education while I was serving my country.”



Contributed photo

Sara Crocoll Smith

Back to that zombie thesis, though:

“The Centers for Disease Control and Prevention had a big hit with the zombie preparedness campaign they developed to make preparing for emergencies more fun. [See cdc.gov/phpr/zombie.] That was one of my all-time favorite government communications campaigns, and my master’s paper allowed me to do a deep dive into the topic and uncover my true love – public health communications.”

Smith graduated from the Gillings School in 2011. These days, she is a health communications specialist in the Food and Drug Administration’s (FDA’s) Center for Tobacco Products (CTP). The CTP, which regulates the manufacturing, marketing and distribution of tobacco products, aims to make tobacco-related death and disease part of America’s past.

As the CTP’s social media content strategist, Smith oversees the @FDATobacco Twitter account, creating original social media content that shares important regulatory updates and highlights the impact of tobacco use on health.

“It’s a great job!” she says. “I’ve found it incredibly rewarding to work in the area of substance use. The FDA commissioner recently announced a comprehensive plan that places nicotine addiction at the center of the Agency’s tobacco regulation efforts, partly in an effort to protect kids. I can’t imagine a more groundbreaking public initiative, and I feel close to the public health mission every day.”

—Jennie Saia

NICHOLAS SULLIVAN

MAKING IT EASY FOR PHYSICIANS TO DO THEIR JOBS

NICK SULLIVAN, MHA, was well prepared when he was hired as vice president of neurosciences for the Greater Charlotte market of Novant Health, a multi-state network of clinics, outpatient facilities and hospitals. He credits the time he spent earning his Master of Healthcare Administration degree in 2012 with grooming him for the job.

His territory includes 60 providers – physicians, physician assistants and nurse practitioners – spread across 16 clinics.

“My job is to develop a strategic vision, recruit doctors and make it easy for them to do their jobs,” he says. “I take on the business functions and operational things that make clinics and operating rooms run. Most of my job is organizing budgets and making sure our physicians have the resources they need.”

Sullivan said he always learned something when he asked questions of Gillings School faculty members.

“I was surrounded by a great group of thinkers and experienced folks at the Gillings School,” he says. “We were taught about policy, business, finance, organizational development – everything that makes organizations tick. Everyone I met was interested in health care for the right reasons, and their example grounded me in values that made me a good leader.”

Sullivan also serves as a member of the Charlotte Chamber Young Professionals Board. Last year, the *Charlotte Business Journal* recognized him as one of the city’s “40 under 40” successful young professionals.

In his spare time, Sullivan works to shed light on mental health issues, particularly in relation to African-Americans. He serves on the board of



Eustress Inc., a program designed to bring mental health awareness to the black community. Sullivan lost a nephew to suicide, and he has friends living with depression and bipolar disorder. For him, it’s a personal mission.

Closer to home, his daughter, born with a rare heart disorder, is the author of *Embrace Your Cape*, a children’s book aimed at helping children cope with the realities of major surgeries or medical diagnoses.

Of all his accomplishments, Sullivan says, it’s his daughter who makes him most proud.

—Janine Latus

November 2017 – April 2018

SCHOOL NEWS

Read more at sph.unc.edu/news.

Selected Publications

Anna Austin, doctoral student, and **Meghan Shanahan, PhD**, assistant professor of MCH, found childhood abuse and neglect were associated with prescription opioid misuse in early adulthood and the role of pain and depressive symptoms in adolescence. Their findings were published in the February *Children and Youth Services Review*.

A study, co-authored by **Jamie Bartram, PhD**, and **Ryan Cronk, PhD**, and published Jan. 11 in the *International Journal of Hygiene and Environmental Health*, provides estimates of environmental conditions in health care facilities in low- and middle-income countries. Bartram, Don and Jennifer

Holzworth Distinguished Professor of ESE and Water Institute director, and Cronk, postdoctoral scholar at the Water Institute, found only 2 percent of health care facilities provide basic services in water, sanitation, hygiene and waste management.

Nabarun Dasgupta, PhD, alumnus and senior epidemiologist at UNC's Injury Prevention Research Center, is lead author of a commentary about social and economic factors that fuel the opioid crisis. His analysis was published Dec. 21, 2017, in the *American Journal of Public Health*.

Two papers by **Karine Dubé, DrPH**, PHLP assistant professor, help map the complex ethics of research

into an HIV cure. The work was published Dec. 5, 2017, in *AIDS Research and Human Retroviruses* and Dec. 8, 2017, in *PLOS Medicine*.

Marc Emerson, EPI doctoral student, led a study that is one of the first to examine potential health disparities among urban American Indians, particularly Alaskan Natives. Findings were published Nov. 29, 2017, in *Cancer Research*.

Daniel Erim, MD, doctoral student, and **Stephanie Wheeler, PhD**, associate professor, both in HPM, conducted a study showing that chemotherapy prior to surgery was more cost-effective than surgery alone in patients with advanced



Anna Austin



Jamie Bartram



Ryan Cronk



Nabarun Dasgupta



Karine Dubé



Marc Emerson



Meghan Shanahan

KEY TO DEPARTMENTS

- BIOS** Biostatistics
- EPI** Epidemiology
- ESE** Environmental Sciences and Engineering
- HB** Health Behavior
- HPM** Health Policy and Management
- MCH** Maternal and Child Health
- NUTR** Nutrition
- PHLP** Public Health Leadership Program



Jeannine Herrick



Dilshad Jaff



Michael Kosorok



Kun Lu



Shu Wen Ng



Hazel Nichols



Aunchalee Palmquist

ovarian cancer. Findings were published Dec. 19, 2017, in *Gynecologic Oncology*.

Dilshad Jaff, MD, MPH, adjunct assistant professor of MCH and program coordinator in the Gillings School's Research, Innovation and Global Solutions office, co-authored a study finding that Syrian refugees in camps in Jordan would benefit from palliative care currently unavailable to them. The work was published Feb. 27 in *Medicine, Conflict and Survival*.

Xin Zhou, PhD, 2015 BIOS alumnus, and **Michael Kosorok, PhD**, W.R. Kenan Jr. Distinguished Professor and chair of BIOS, are lead authors of significant research showing the successful use of machine learning to discover precision medicine and potentially salvage failed clinical trials. Their work, which appeared in Vol. 112 (2017) of the *Journal of the American Statistical Association*, is an important advancement of 'outcome-weighted learning' for precision medicine that was developed originally in 2012 by BIOS alumna **Yingqi Zhao, PhD**, along with Kosorok, **Donglin Zeng, PhD**, BIOS professor, and A. John

Rush, MD, professor emeritus at the National University of Singapore.

N.C. Institute for Public Health staff members, including project manager **Jeannine Herrick, MPH**, worked with the John Rex Endowment to produce the report *Exploring the Social Determinants of Health – Wake County (N.C.)*, an assessment and online Story Map that describes conditions related to childcare centers, food deserts and housing costs. See tinyurl.com/NCIPH-Wake-social-determinants.

Kun Lu, PhD, ESE assistant professor, found in a mouse study that nicotine alters the gut microbiome differently in females than males, thus making it more difficult for women to quit smoking. Findings were published Oct. 16, 2017, in *Chemical Research in Toxicology*.

A study led by **Hazel Nichols, PhD**, assistant professor of EPI, examined the risk of premature birth and other health concerns for the newborns of breast cancer survivors. Published Jan. 4 in the *International Journal of Cancer*, the study also recommended that fertility counseling is important for women with breast cancer who may want to have children.

Shu Wen Ng, PhD, NUTR associate professor, is lead author of a study published Feb. 14 in the *American Journal of Preventive Medicine*. The study showed that improvement in the food choices and nutritional content of WIC (Special Supplemental Nutrition Program for Women, Infants and Children) packages has produced changes in food purchase habits among WIC participants. Ng also worked with **Barry Popkin, PhD**, W.R. Kenan Jr. Distinguished Professor of NUTR, and **Juan Carlos Caro, HPM** doctoral student, to estimate likely outcomes if Colombia were to institute a national tax on sugar-sweetened beverages. That work was published Dec. 20, 2017, in *PLOS One*.

Aunchalee Palmquist, PhD, assistant professor of MCH, contributed to and co-edited the book *Breastfeeding: New Anthropological Approaches* (New York: Routledge, 2018). **Kristin Tully, PhD**, research associate at the Carolina Global Breastfeeding Institute, also co-authored a chapter in the book on enabling breastfeeding.

A study published Feb. 21 in *JAMA Psychiatry* links depression

in people living with HIV to increased likelihood of missing medical appointments, increased risk of HIV treatment failure and higher mortality rates. Co-authors include **Brian Pence, PhD**, associate professor, **Jon Mills, PhD**, postdoctoral scholar, **Tiffany Breger**, doctoral student, and **Bradley Gaynes, MD, MPH**, adjunct professor, all in EPI.

Bert Peterson, MD, W.R. Kenan Jr. Distinguished Professor of MCH, authored two articles about ways implementation science can deliver on the promise to achieve health and well-being for mothers and newborns globally. Peterson's perspectives were published in the March *Obstetrics and Gynecology*.

A March 13 report by the President's Cancer Panel, chaired by **Barbara K. Rimer, DrPH**, Gillings School dean, found that urgent action must be taken to address the dramatic rise of cancer drug prices

and better align prices with value. (See tinyurl.com/PCP-drug-cost.)

Gary Rozier, DDS, MPH, and **Jane Weintraub, DDS, MPH**, co-authored an oral health paper commissioned by the National Academies' Roundtable on Health Literacy. Their paper concludes that health care delivery system models are developing rapidly and have potential for the integration of oral health. Among the team's recommendations are a call for adequate funding to implement and sustain the integration. Rozier is professor of HPM; Weintraub is an adjunct professor in HPM and Alumni Distinguished Professor in the UNC School of Dentistry.

Paul Shafer, HPM doctoral student, found that smoke-free air laws have no greater financial impact on small businesses than on large ones. His findings were published Nov. 25, 2017, in *BMJ Open*.

Jennifer Smith, PhD, EPI professor, and **Matt Psioda, PhD**, BIOS assistant professor, completed a study in Kenya that found self-collection of specimens was comparable to physician-collection when screening for four sexually transmitted infections in a population of female sex workers. Results were published Jan. 2 in *Sexually Transmitted Diseases*.

Jason West, PhD, associate professor in ESE, found that actions to slow climate change significantly would improve air quality in the U.S. and avoid about 24,000 premature deaths associated with air pollution in the year 2050. The work was published Nov. 14, 2017, in *Environmental Research Letters*.

A history of the epidemiology department's first 40 years (1936-1976) is now available. Compiled by **Judith Winkler, MEd**, and **Victor Schoenbach, PhD**, the PDF is available online at tinyurl.com/history-UNC-EPI.



Brian Pence



Bert Peterson



Barbara K. Rimer



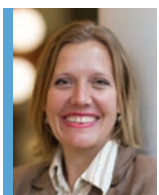
Gary Rozier



Victor Schoenbach



Paul Shafer



Jennifer Smith



Jane Weintraub



Jason West

Selected Grants

Richard Bilsborrow, PhD, BIOS professor, is co-investigator on a UNC team awarded a three-year, \$720,000 grant to study the effects of social and ecological factors, particularly human migration and tourism, on the environment and sustainability of island ecosystems. The award was made by the NASA Land Cover/Land Use Change Program.

The Carolina Global Breastfeeding Institute (CGBI) was awarded a three-year, \$1.3 million grant from the W.K. Kellogg Foundation to increase the representation of men and women of color employed and serving as certified lactation consultants in vulnerable communities. **Catherine Sullivan, MPH**, MCH assistant professor, is CGBI's director. CGBI also was awarded a three-year, \$830,000 grant from the Duke Endowment

to expand work with hospitals in support of breastfeeding.

Greg Characklis, PhD, Philip C. Singer Distinguished Professor of ESE, is part of a team awarded \$2.5 million by the National Science Foundation to study the variability of flood and drought conditions in Oregon's Willamette River Basin.

MEASURE Evaluation, UNC-Chapel Hill's largest project in global health, was awarded a new \$52 million in USAID funding to strengthen public health information systems around the world, bringing the project's total funding to \$231.9 million – the largest amount ever received by UNC. **Jim Thomas, PhD**, associate professor of EPI, is the project's director.

Ilene Speizer, PhD, MCH professor, will lead a \$4 million

Gates Foundation grant to evaluate contraceptive method choices for youth in Africa and Asia.

Jacqueline MacDonald Gibson, PhD, ESE associate professor, will lead research projects to address emerging contaminants in North Carolina, including GenX, a potentially toxic industrial compound detected in the Cape Fear River. The \$430,000 in funding was provided by the N.C. Policy Collaboratory, established by the N.C. General Assembly to facilitate dissemination of UNC's expertise for practical use by state and local governments.

The Department of Health Policy and Management, chaired by **Morris Weinberger, PhD**, Vergil N. Slee Distinguished Professor of Healthcare Quality Management, was one of eight national winners of the inaugural CAHME/ Aramark Innovation Grants, which recognize innovative ideas in improving graduate health care management education.

Save the Date

Gillings School Reception at APHA San Diego

Monday, Nov. 12

6:30 p.m.

Hilton San Diego Bayfront

sph.unc.edu/2018-APHA-reception



Catherine Sullivan



Jim Thomas

Other news

UNC launched the innovative Center on Financial Risk in Environmental Systems in December 2017. A partnership between the Gillings School's ESE department and the UNC Institute for the Environment, the center is led by **Greg Characklis, PhD**, Philip C. Singer Distinguished Professor of ESE. (See page 63.)

Rebecca Fry, PhD, Carol Remmer Angle Distinguished Professor of Children's Environmental Health in ESE, was selected to lead the school's new Institute for Environmental Health Solutions. An early project was to provide water filters to N.C. communities in which researchers have identified contaminated water supplies. (See page 64.)

Til Stürmer, MD, PhD, EPI professor, became department chair on March 1, succeeding Andrew Olshan, PhD, who served as chair for 11 years. Stürmer is also director of the UNC pharmacoepidemiology program.

Adaora Adimora, MD, and **David Margolis, MD**, both EPI professors, were named Sarah Graham Kenan Distinguished Professors in March.

Lisa LaVange, PhD, current president of the American Statistical Association and formerly with the U.S. Food and Drug Administration, returned to UNC-Chapel Hill in January as professor and associate chair of biostatistics and director of the UNC Collaborative Studies Coordinating Center.

Jacqueline MacDonald Gibson, PhD, associate professor in ESE and RTI University Scholar, is partnering with RTI International to test private wells in Wake County, N.C., for lead contamination, which especially puts young children at risk. Participants are invited to enroll through May. Contact (919) 843-5786 or cleanwater@rti.org.



Kauline Cipriani

On Feb. 19, the Gillings School welcomed **Kauline Cipriani, PhD**, as the assistant dean for inclusive excellence. Cipriani's initiatives at Purdue University, where she previously served, helped Purdue's veterinary college become a national leader in diversity and inclusion efforts, with replicable models and measurable results.



Adaora Adimora



Greg Characklis



Rebecca Fry



J. MacDonald Gibson



Lisa LaVange



David Margolis



Til Stürmer

November 2017 – April 2018

AWARDS & RECOGNITIONS

Read more at sph.unc.edu/news.

STUDENTS

Liz Chen and **Cristina Leos**, HB doctoral students, were selected for *Forbes* magazine's '30 under 30' list of young entrepreneurs in November 2017.

Oluoma Chukwu, **Lauren Jordan** and **Jessica Broadus**, HPM master's students, took first prize at the 22nd annual Everett V. Fox Student Case Competition, held Oct. 17–20, 2017, in San Antonio. Each was awarded a \$4,000 scholarship.

Alyssa Cozzo, doctoral student in NUTR, received the 2017 Marci Kramish Campbell Dissertation Award. Cozzo studies how breast tissue in obese people affects cancer risk and outcomes.

Leah Everist, senior BSPH student in HPM, was selected as a 2018 Luce Scholar, one of 18 undergraduates in the U.S. chosen



Left to right are Oluoma Chukwu, Lauren Jordan and Jessica Broadus, winners of the Everett Fox Student Case Competition.

for this prestigious internship program in Asia.

Tyler Malone, HPM doctoral student, was named a 2018 Future Faculty Fellow by UNC-Chapel Hill's Center for Faculty Excellence.

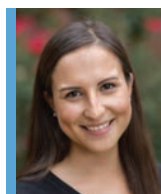
Frank Stillo, MSPH, ESE doctoral student, was named one of three "Students Who Rocked Public Health in 2017" by the *Journal of*

Public Health Management and Practice. Stillo studies disparities in drinking water quality in African-American communities.

Burcu Bozkurt, HPM doctoral student, was awarded a 2018 Paul and Daisy Soros Fellowship for New Americans. The fellowship honors the contributions of immigrants and their children. Bozkurt left her native Turkey at age seven to come with her parents to the U.S.



Liz Chen



Cristina Leos



Frank Stillo

FACULTY

Four Gillings School professors were named by Clarivate Analytics as being among 2017's most highly cited

Photo by Linda Kastleman

Our Impact Awardees

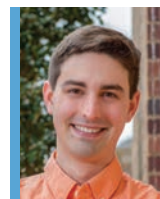
Seven of 22 **Impact and Horizon Awards** were presented in April by the UNC Graduate School to Gillings School students for work that benefits North Carolina and its people. The Graduate Education Advancement Board Impact Award recognizes graduate students and recent alumni whose research directly contributes to the educational, economic, physical, social or cultural well-being of North Carolinians. The Horizon Award recognizes those whose research holds extremely high potential for impact in North Carolina and beyond at some future time. Winners include **Julia Considine (PHLP)**, **Thibaut Davy-Mendez (EPI)**, **David Gorelick (ESE)**, **Cassandra Johnson (NUTR)**, **Sarah Kowitt (HB)**, **Shan McDonell (NUTR)** and **Sarah Rhodes (ESE)**.



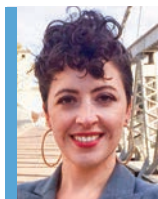
Julia Considine



Thibaut Davy-Mendez



David Gorelick



Cassandra Johnson



Sarah Kowitt



Shan McDonell



Sarah Rhodes

researchers. They are **Ralph Baric, PhD (EPI)**, **Noel Brewer, PhD (HB)**, **Hans Paerl, PhD (ESE)** and **Barry Popkin, PhD (NUTR)**.

Jamie Bartram, PhD, Don and Jennifer Holzworth Distinguished

Professor of ESE, and **Jacqueline MacDonald Gibson, PhD**, ESE associate professor, were named to the N.C. Science Advisory Board to study emerging chemicals. Bartram was named to chair the board.

Peggye Dilworth-Anderson, PhD, HPM professor, was awarded the 2018 Pearmain Prize for Excellence in Research on Aging by the University of Southern California's Roybal Institute on Aging. In April, she also received the UNC Office for Diversity and Inclusion's 2018 University Diversity Award.

Diego Garza, MD, MPH, alumnus and adjunct PHLP faculty member, won the *Triangle Business Journal* 2018 Health Care Heroes Award.



Ralph Baric



Noel Brewer



P. Dilworth-Anderson



Hans Paerl



William Gray



Barry Popkin



Whitney Robinson



C. Samuel-Hodge



Raza Shaikh



Jeffrey Simms



Jason Surratt

William Gray, PhD, ESE professor, was elected to the National Academy of Engineering, among the highest professional distinctions accorded an engineer, for theoretical work to develop approaches for modeling flow and transport phenomena in porous media systems, such as those beneath the earth's surface. The theory also has biomedical applications, such as for tumor growth and treatment.

Barry Popkin, PhD, W.R. Kenan Jr. Distinguished Professor of NUTR, was invited by the American Heart Association's Lifestyle and Cardiometabolic Health Council to present the David Kritchevsky Memorial Lecture in New Orleans on March 22.

Raza Shaikh, PhD, associate professor of NUTR, received the American Society for Nutrition's 2018 Mary Swartz Rose Young Investigator Award.

Barbara Turpin, PhD, professor and chair of ESE, won the American Chemical Society's 2018 Creative Advances in Environmental Sciences and Technology Award.

On April 18, eight faculty members were presented with the Gillings School's 2018 Teaching Innovation Award. They are **Carolyn Crump, PhD**, HB associate professor, **Amanda Holliday, PhD**, NUTR assistant professor, **Whitney Robinson, PhD**, associate professor of EPI, **Kathy Roggenkamp, MA**, BIOS instructor, **Meghan Shanahan, PhD**, assistant professor of HPM, **Jason Surratt, PhD**, ESE associate professor, **Justin Trogdon, PhD**, HPM associate professor, and **Vaughn Upshaw, DrPH, EdD**, PHLP professor.

Three Gillings School faculty members were honored at commencement as winners of the School's most prestigious awards for teaching, research, mentoring and service. They are **Amanda Holliday, MS**, NUTR assistant professor, winner of the Greenberg Award; **Jeffrey Simms, MSPH, MDiv**, assistant professor of HPM, winner of the Larsh Award; and **Carmen Samuel-Hodge, PhD**, NUTR assistant professor, winner of the Barr Award.

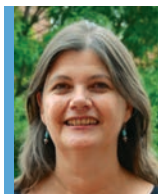


Photo by Linda Kestleman

Teaching Innovation Award winners (l-r) are Meghan Shanahan, Amanda Holliday, Kathy Roggenkamp, Carolyn Crump, Justin Trogdon and Vaughn Upshaw. Pictured separately above are Whitney Robinson and Jason Surratt.



Alice Ammerman



Nora Franceschini



Stephanie Wheeler

Alice Ammerman, DrPH,

Mildred Kaufman Distinguished Professor of NUTR, was honored April 9 with the UNC-Chapel Hill Office of the Provost Engaged Scholarship Award. The award recognizes extraordinary public service and engaged scholarship at UNC-Chapel Hill. Ammerman, who also is director of the UNC Center for Health Promotion and Disease Prevention, was recognized for engaged research

for the Heart Healthy Lenoir project (hearthealthylenoir.com).

Stephanie Wheeler, PhD,

associate professor of HPM, was awarded UNC's Philip and Ruth Hettelman Prize for Artistic and Scholarly Achievement by Young Faculty in September 2017. On May 1, she presented the Hettelman Lecture, "How Wealth, Race and Place Affect Cancer Outcomes." Wheeler also was recognized in

November 2017 as a distinguished alumna of her undergraduate alma mater, College of Charleston.

Nora Franceschini, MD, MPH,

associate professor of EPI, was selected for the Trudy Bush Fellowship for Cardiovascular Disease Research in Women's Health by the American Heart Association Council on Epidemiology and Prevention.

Barbara K. Rimer, DrPH,

dean of the Gillings School, was appointed to the N.C. Governor's Commission on Inclusion. She will work with Gov. Roy Cooper and commission members to leverage diversity and foster inclusion in the state.



Congratulations, graduates! Camara P. Jones, MD, MPH, PhD, was scheduled to present the Gillings School's commencement address on May 12. Jones is past president of the American Public Health Association and senior fellow at Morehouse School of Medicine's Satcher Health Leadership Institute and Cardiovascular Research Institute.



FROM THE ASSOCIATE DEAN FOR ADVANCEMENT

The University of North Carolina at Chapel Hill is home to many of the world's most talented students, faculty and staff. At the UNC Gillings School of Global Public Health, we are reminded daily that timely deployment of strategic ideas and resources makes the difference between life and death. As the #1 *public* school of public health, we stand ready to face the greatest issues of our time.

Public health is a dynamic field in which the issues we face are changing constantly. Our solutions, therefore, must be equally dynamic. To keep our problem-solving on pace with novel disease development, evolving viruses that resist known cures, and global population growth that spawns new challenges, we must invest in fresh ideas.

At the UNC Gillings School, we innovate because we must. From combating harmful physical and social environmental threats, to harnessing big data to solve statistical puzzles on a global scale, to trailblazing efforts in implementation science that ensure 'light-bulb' ideas become practical solutions, the Gillings School sets the pace.

Join us in the Campaign for Carolina as we continue providing our students with world-class education and training, our faculty members with the necessary tools to advance their research and our School with the 21st-century resources needed to maintain our position as a global leader.



In appreciation,

Karissa Grasty

Karissa Grasty

our priorities

Prepare Future Leaders

Students who are working to become agile, effective, innovative leaders need your investment in their education.

Scholarships, travel, internships, fellowships, research, conference presentations and hands-on experiences – both local and global – build superior leaders prepared to address the fast-moving, ever-changing health challenges of the 21st century.

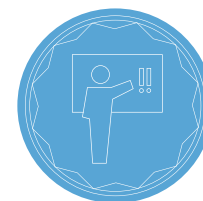


Deliver Proven Solutions Faster

The world's best interventions achieve their potential only when they are delivered to those who need them. We call this implementation science, and it permeates all that we do. Funding for innovative programs, practice methods and research accelerates solutions that detect cancers earlier; help prevent diabetes, heart attacks and strokes; decrease substance abuse; prevent mother and infant deaths; and increase the pace of clinical trials worldwide.

Accelerate Faculty Impact

Competitive excellence in higher education requires attracting and keeping talented faculty members who often are sought by other universities offering large financial incentives. Endowed professorships, research funds and other tools help retain our best faculty, those who are accelerating solutions for the most pervasive threats to human and environmental health.



CAMPAIGN FOR CAROLINA

Gillings School of Global Public Health

Fundraising Progress Report,
as of March 1, 2018

RAISED

\$109.11
MILLION

GOAL

\$200
MILLION



TOWARD OUR PRIORITIES, WE'VE RAISED:

ACCELERATE
Faculty Impact

\$7.2 MILLION

PREPARE
Future Leaders

\$20.1 MILLION

DELIVER
Proven Solutions Faster

\$81.2 MILLION

UNC GILLINGS SCHOOL

#1

PUBLIC SCHOOL OF
PUBLIC HEALTH

99%

OF OUR GRADUATES ARE
EMPLOYED OR CONTINUING
THEIR EDUCATION

\$209.6
MILLION

TOTAL RESEARCH
FUNDING IN FY17

GILLINGS SCHOOL-SPONSORED
PROJECTS ARE CONDUCTED IN

62
COUNTRIES

100
OUT OF 100 N.C.
COUNTIES

19,000+
ALUMNI

50
STATES

114
COUNTRIES

OUR YEAR IN NUMBERS

*Just a reminder –
A monthly gift of*

\$83.34

QUALIFIES FOR THE
ROSENAU SOCIETY

240

Fulltime Faculty
Members

311

Fulltime Staff
Members

1,548

Total Student
Enrollment

OUR ENDOWMENT

\$86+
MILLION

5

YEARS OF
CONSECUTIVE
GIVING

Elizabeth Strawbridge

MPH, 2013

"I'm so grateful for my education and the network of contacts provided to me by the Gillings School and the amazing nutrition department! That's why I keep giving."

10

YEARS OF
CONSECUTIVE
GIVING

Kirkland Lynch

BSPH, 2008

"I'm inspired to give back to the Gillings School because while there, I was part of a group of people really trying to change the world. I don't want to be left out of that mission, even though I'm no longer pursuing a career in public health."

25

YEARS OF
CONSECUTIVE
GIVING

Sandy Moulton, JD

MPH, 1978

Public Health Foundation board member emeritus;
chair, 2008–2010

"Having a degree from the Gillings School has given me so many opportunities in my career and life that I wouldn't have had otherwise. When I was in school, I had the advantage of receiving a federal stipend, funding which is no longer available. My husband and I are proud to pay forward to provide support to today's students."

A chance encounter led him to his long-term mentor

James Rosen, MBA, MSPH, never worries about being bored. He's always juggling a half-dozen projects. From his years on Wall Street to founding entrepreneurial companies, he challenges himself to make innovative contributions for the benefit of others.

As chair of the Gillings School's Public Health Foundation board, Rosen has used his boundless energy and business acumen to advance the School's mission and improve opportunities for its faculty members and students.

Part of his motivation to serve the Gillings School, he says, has to do with his passion for public health and his gratitude for the opportunities he had while earning his master's degree at the School. Another part, though, is serendipitous.

In the early 1990s, after earning a bachelor's degree in public policy at Duke University, he left for Colorado, where he started a financial analytics business and immersed himself in learning about emergency medical services. He accrued more than 1,000 hours of search-and-rescue and paramedical training and planned to be a health care provider – until he realized he was most interested in health care *research*.

So he decided to switch careers.

Returning to North Carolina, he began knocking on doors at Duke.

"Everywhere I called, people turned me away," Rosen says. "They said I lacked experience in scientific research. One remarkable person was interested in



Jimmy Rosen

hearing my story. She gave me several good leads, but none of them panned out."

Later, walking around the Duke campus, Rosen dropped by the woman's office to thank her for her suggestions. She invited him in, and they talked for nearly an hour. At the end of the meeting, she offered him a job – entering data for a breast cancer study.

The woman was Barbara K. Rimer, DrPH, then director of cancer prevention, detection and control

“”

In business, we aim to recruit, retain and support great teammates. We profit from their staying with us and increasing their knowledge, and we aim to have our customers and collaborators remain satisfied. It's the same with the School.

– Jimmy Rosen



research at the Duke Comprehensive Cancer Center, now dean at the UNC Gillings School. They established a lasting relationship that would influence Rosen's career for years to come.

When Rimer was at the National Cancer Institute (NCI), Rosen supported her as an independent contractor before heading to Wall Street to try his hand in health care finance.

After three years in New York, he realized that his work was more distant from scientific research than he wanted, and he emailed Rimer at NCI to let her know he was heading back to North Carolina.

"It's not widely known," she told him, "but I'm leaving soon to serve as deputy director for population sciences at UNC's Lineberger Comprehensive Cancer Center. Let's talk."

For a third time, their paths crossed, and Rosen worked with Rimer at UNC Lineberger to launch a research project.

He also made time to enroll as a public health student, obtaining dual Master of Science in Public Health and Master of Business Administration degrees in 2007. By then, Rimer had been selected as the public health school's dean.

"Walking across the stage at commencement to receive a public health degree from Barbara was among my greatest pleasures," Rosen says. "My affinity for public health had come full circle."

After he graduated, the dean contacted Rosen and asked him to serve on the Gillings School's Public Health Foundation board.

"Serving as a board member and chair has been rewarding," Rosen says. "Everyone brings unique gifts to the table. Faculty members are knowledgeable about public health priorities and local and global needs. Alumni bring context to the work the School does. Alternate perspectives – from industry, health care providers, and leaders in state, local and federal agencies – all enrich the conversation."

Rosen says that growing a business is similar to advancing the mission of the School.

"In business, we aim to recruit, retain and support great teammates," he says. "We profit from their staying with us and increasing their knowledge, and we aim to have our customers and collaborators remain satisfied. It's the same with the School. Especially in this time of declining state and federal support, we need to attract and keep talented faculty and provide opportunities to our outstanding students. Students are our customers. We want to encourage them – and equip them with all the skills they need to be successful."

–Linda Kastleman

Tomorrow's public health leaders – *already engaged!*

We spoke recently with three Gillings School students who are well on their way to successful careers in public health.



Blake Fulton

MPSH, Environmental Sciences and Engineering, 2018

WHAT HAS BEEN YOUR FAVORITE EXPERIENCE AT THE GILLINGS SCHOOL?

Sitting in on my first meeting for the Rwandan cookstove project. My research involves assessing hydrocarbon exposure, and for the first time, I heard details of other aspects of the research and gained insight into the scope of a collaborative research project. I saw how research works in a real and applied sense, and even with my limited participation, that awareness has provided me with a wealth of experience.

WHAT IMPACT HAS YOUR SCHOLARSHIP HAD?

The Fraser scholarship has given me the freedom to pursue an excellent education, learn from a renowned faculty and gain experience as a teaching assistant, researcher and environmental health and safety worker, without being burdened with more debt. All of this prepares me for a career in industrial hygiene, where I feel that I can improve the quality of life for others and ensure that people are able to earn a living without concern for their health.



Busola Sanusi

PhD, Biostatistics, 2019

WHAT PUBLIC HEALTH ACCOMPLISHMENT ARE YOU MOST PROUD OF?

My proudest public health accomplishment to date was a collaborative research project aimed at improving the treatment protocol for invasive cervical cancer in HIV-positive women. We wanted to focus on women in resource-limited countries, so we used South Africa as a case study. My adviser and I worked with researchers from across UNC and South Africa.

WHAT IS YOUR DREAM CAREER?

My long-term public health goal is to be the director of an infectious disease center. I want to lead a team



Photo by Jennie Sala

that is dedicated to helping people with health issues live their best lives.

WHAT WOULD YOU LIKE TO TELL THOSE WHO FUND SCHOLARSHIPS?

Every act of generosity produces a ripple effect. The beneficiaries of your support in turn give back to others, and the world is made a better place because of you.

Adrianna Warner

MPH, Public Health Leadership Program, 2019

WHAT HAVE YOU BEEN INVOLVED IN THIS YEAR?

In addition to starting my practicum experience with Chatham Hospital, I'm working on an interdisciplinary student team to develop and implement a quality improvement project to improve health outcomes in Chatham County (N.C.). My studies have furthered my passion for helping rural, underserved populations, and I'm excited to be able to create real change in a real community! I've also become involved as a volunteer with the Student Health Action Coalition at UNC and am working on a diabetes intervention project with the Eastern Band of Cherokee Indians.

WHAT DOES RECEIVING A SCHOLARSHIP MEAN TO YOU?

Being a first-generation college graduate and graduate student, this funding was crucial in allowing me to



Photo by Deanna Wilkie

attend the Gillings School and pursue a Master of Public Health degree. It is bringing me closer to my goal of attending medical school and helping underserved populations in western North Carolina.

For more information about supporting the education and training of other Gillings School students, please contact the Gillings School's advancement office at (919) 966-0198 or giving.sph@unc.edu.



Gregory Characklis (left) and Rebecca Fry

Gregory Characklis and Rebecca Fry

Solve environmental health problems

Leaders of two new initiatives within the Department of Environmental Sciences and Engineering (ESE) are doing what the Gillings School does best – solving problems.

The organizations tap into expertise from across campus and beyond to create practical strategies to be used by individuals, businesses and communities in dealing with natural and human-caused environmental harms.

One of the new initiatives, the Institute for Environmental Health Solutions, deals with the impact of environmental factors on physical health. The other, the Center on Financial Risk in Environmental Systems, considers the environment's impact on financial health. The initiatives are doing more than studying the problems – they're producing solutions.



CENTER ON FINANCIAL RISK IN ENVIRONMENTAL SYSTEMS



At Cane Creek Reservoir in Chapel Hill, N.C., Dr. Greg Characklis (at map) and his research group discuss reservoir management and its impact on water supply.

The newly established UNC Center on Financial Risk in Environmental Systems, an interdisciplinary group working in the areas of engineering, hydrology, economics and finance, aims to alleviate financial risks caused by extreme weather events, such as drought.

Jointly housed in the Gillings School's ESE department and UNC's Institute for the Environment, the Center is led by Gregory Characklis, PhD, the Philip C. Singer Distinguished Professor in ESE.

"We're working to build models that incorporate consideration of natural events, engineering and economics," Characklis says. "Financial losses from droughts are a function of how available water is, how it is managed, and its value as it becomes more scarce. We work to develop strategies and tools to help groups manage the resulting financial risk."

For example, corn growers who transport their product on the Mississippi River see expenses spike during droughts. Lack of rain lowers their crop yield, and then, low water levels in the river disrupt barge traffic, causing costly delays that have an impact upon both growers and barge companies.

For now, the way to keep barges moving is to dredge the channel deeper – an expensive process that also damages the environment.

"We could reduce the demand for dredging if we developed a new kind of index insurance linked to water levels in the river," Characklis says. "Participants pay a premium, and if levels drop below a certain threshold, a payment is made. This type of insurance would protect key players from the most extreme drought events."

A similar financial instrument would protect urban water utilities from significant financial losses during drought at a time when building new reservoirs and maintaining large supply capacities are financially and environmentally burdensome.

"Urban water utilities increasingly are forced to rely on temporary conservation measures to manage drought," Characklis says. "Conservation is important, but it means the utility sells less water. This reduces a utility's revenues while its costs remain fixed, creating a budget shortfall."

The Center has worked with utilities to develop insurance that makes payments to utilities when conservation measures are imposed and revenues decline.

"If we can help utilities manage financial risk," Characklis says, "we can encourage them to make more environmentally friendly decisions."

INSTITUTE FOR ENVIRONMENTAL HEALTH SOLUTIONS



Members of Dr. Rebecca Fry's team at the Institute for Environmental Health Solutions are (l-r) Zamira Gleason, Dr. Hazel Nichols, Dr. Mirek Styblo, Dr. Fry, Dr. Ilona Jaspers, Dr. Tracy Manuck and Lisa Smeester.

Rebecca Fry, PhD, Carol Remmer Angle Distinguished Professor of Children's Environmental Health, is director of the Institute for Environmental Health Solutions. Her interdisciplinary team at the Institute uses data-driven strategies to identify people, including pre-term infants and cancer survivors, who are particularly vulnerable to environmentally influenced disease. The team's goal is to translate scientific discoveries into effective, easy-to-apply solutions.

"Very often, as scientists, we come into an area and identify an environmental problem but do not provide solutions to individuals and communities," Fry says. "Our goal at the Institute is to put the solutions directly into the hands of individuals and communities of North Carolina and beyond."

Among the Institute's early projects has been to provide cost-effective water filters to North Carolina communities in which researchers have identified contaminated water supplies.

Members of the group also study potential changes in direct patient care, determining factors that improve

the long-term health of early-term babies, for example, and delivering the findings to clinics, with the goal of saving lives.

Others study cigarette smoke-related illness and soil-based contamination.

Team members are developing strong partnerships with the Environmental Protection Agency and other environmental health-focused universities, enabling researchers to collaborate with, and students to be mentored by, an array of experts.

"There is a gap in how we're addressing the environment and how it influences health," Fry says. "We're working to find modifiable factors that can be used as interventions to prevent disease and promote human health."

—Janine Latus

Fry also is associate chair of the Department of Environmental Sciences and Engineering, director of the UNC Superfund Research Program and director of graduate studies for the UNC Curriculum in Toxicology.

Join us at APHA!

Plan now to attend the 2018 meeting
of the American Public Health Association

Creating the Healthiest Nation: Health Equity Now

November 10–14 in San Diego

Please join us at the Gillings School reception on Monday, November 12, at 6:30 p.m.

Hilton San Diego Bayfront

Learn more at sph.unc.edu/2018-APHA-reception.



Alumni and friends celebrate at the Gillings School's reception during last year's APHA meeting. Everyone enjoyed getting (re)acquainted during the Nov. 6, 2017, event at Atlanta's Georgia Aquarium – and especially enjoyed meeting the whales!



GILLINGS SCHOOL OF
GLOBAL PUBLIC HEALTH

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of NORTH CAROLINA
at CHAPEL HILL

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