We have all heard the saying: You only get one chance to make a first impression. That standard is a welcome one for the faculty and staff in the Department of Population Health Sciences. We launched the department in July 2017 and spent our inaugural year moving deliberately and successfully in each of the directions we planned.

We have pursued important research, drawing on deep expertise across Duke and engaging new colleagues. We have developed educational offerings, winning University approval for exciting graduate programs and delivering other learning opportunities. We have served communities near and far, drawing on our close connection to Duke’s health system.

Samples of our work fill this first annual report. This is a selection, not a catalog of those successes. We could walk into nearly any office in the department’s new home in downtown Durham and hear other, equally exciting examples.

I remain honored to have been named the department’s first chair last November and energized by the hard work and commitment our faculty and staff have demonstrated and continue to exhibit each day. I know we will continue to find ways to help improve the health of the many communities who benefit from our efforts.

Lesley H. Curtis, PhD
Chair and Professor
Department of Population Health Sciences
Interim Executive Director, Duke Clinical Research Institute
Duke University School of Medicine
The science of population health examines health outcomes, underlying determinants of health, and disease states in populations defined by many factors including geography, ethnicity, employment, or the health care systems in which people seek care. Improving the health of a population demands a multi-faceted approach that examines the underlying causes of health, uses data regarding environmental, social, behavioral, physical, and genetic determinants of health to improve health, and informs policies that shape access to, financing and delivery of high quality health care.

Opening lines of the March 2016 proposal for the Department of Population Health Sciences
A NEW FOCUS ON POPULATION HEALTH

When the Duke University Board of Trustees voted on May 13, 2017, to create a Department of Population Health Sciences in the School of Medicine, the decision was part commencement, part culmination.

Obviously, it was the start of a new department. The trustees’ approval brought Duke in line with its peers among leading American medical schools. Among the other universities with top 20 medical schools, eight had schools of public health (some more than a century old), five had university-wide population health institutes, and one had a population health department within its medical school.

“It is important to be able to bridge across our work, from basic science all the way to the implementation science that brings improvement to the health of our community.”

At the time, only Duke and one other top 20 medical school lacked such a high-level commitment to the study of population health. The department was designed, however, to recognize Duke’s existing strengths and additional potential in measurement science, implementation science, health services research, and scientific engagement with the University’s health system. In addition, a department dedicated to population health sciences acknowledged growing attention across the health care sector to determinants of health that extend well beyond clinical encounters.

At the same time, the department’s creation was the fruition of planning done by an 18-member working group appointed by then-School of Medicine Dean Nancy Andrews in October 2015. The working group’s proposal delivered in March 2016 described a transdisciplinary department of nonclinical scholars in behavioral science, epidemiology, health economics, health services research and policy, and implementation science. It called for bringing together researchers from across the School of Medicine, as well as recruiting several new faculty members.

With support from Health Affairs Chancellor A. Eugene Washington, the school created a Center for Population Health Sciences to serve as a springboard to the department pending the trustees’ approval 14 months later. School of Medicine Dean Mary E. Klotman, MD, who assumed her new leadership role a month after the department was created, has continued strong institutional support for the department and its fields of study. “We know that the determinants of health more often than not exist outside of clinical experiences,” she said. “Faculty, staff, and students in our Department of Population Health Sciences are exploring those factors and working to determine how to better address them and ultimately improve health locally and worldwide.”
THE RIGHT DISH TO FIGHT STOMACH CANCER

MEIRA EPPLEIN, PHD
ASSOCIATE PROFESSOR IN POPULATION HEALTH SCIENCES
Stomach cancer can be beaten. A two-week course of antibiotics accompanied by a proton pump inhibitor such as Prilosec can kill *Helicobacter pylori*, the bacteria that causes the cancer. *H. pylori* leads to more new cases of cancer annually than other infections that are far more commonly known. Only one in five stomach cancer patients survives five years or more after diagnosis, however, because the cancer usually is discovered late. Meira Epplein, PhD, associate professor in population health sciences, believes that troubling pattern can be disrupted.

Half of the world’s population is infected with *H. pylori*, including 30 percent in the United States. Fewer than 3 percent of those infected will develop stomach cancer. As a result, physicians do not routinely order, and health insurance companies do not pay for, the $150, 20-minute test to confirm infection.

Only one in five stomach cancer patients survives five years or more after diagnosis, however, because the cancer usually is discovered late. The risk, however, is not evenly distributed. Infection in the African American community matches the worldwide rate. Stomach cancer is the sixth leading cause of death among African American men, creating the greatest racial disparity in cancer deaths nationally. Dr. Epplein arrived at Duke in May 2017 with a proposal in mind to translate epidemiology on *H. pylori* into action to intervene against it.

Initially she envisioned a small study working through a county health department. However, when she met with new colleagues to describe her idea, they urged her to think beyond typical settings – a contrast to reticence from her previous university’s institutional review board around releasing results directly to participants.

The Duke Cancer Institute had a long-standing relationship with the River Church, one of Durham’s largest predominantly African American churches. Leveraging those prior discussions about clinical research, Dr. Epplein met with Pastor Ronald Godbee. “He said he thought we were doing the same work,” Dr. Epplein recalled. “He said he’s saving souls and I’m saving lives.” She also tapped a group of A.M.E. Zion pastors with whom Duke consults. The pastors gave her frank advice – the idea of a potentially fatal infection will scare people, many in a congregation will not be insured.

After two more visits with congregants, Dr. Epplein and her colleagues held the inaugural screening event for the Durham Initiative for Stomach Health (DISH) in May 2018. Ninety River Church members over the age of 40 who met a few other study criteria were administered the breath test, had blood drawn for a parallel study on antigen biomarkers, and filled out a questionnaire. All 90 DISH participants got their test results; 23 were infected with *H. pylori* and counseled on treatment.

Dr. Epplein hopes to expand DISH, but her ultimate goal is to change policies around screening. She wants DISH and other interventions to demonstrate that simple, routine testing directed at the appropriate, high-risk populations will save lives and prove cost-effective in the same way other procedures to identify other cancers have.
KNOWLEDGE INTO PRACTICE

HAYDEN BOSWORTH, PHD
PROFESSOR IN POPULATION HEALTH SCIENCES AND VICE CHAIR OF EDUCATION
To study health outcomes and determinants of health that can range from genetics to geography, the science of population health draws on a wide array of knowledge. To be prepared in the field requires the integration of theory, applications, and tools to explore the intertwined pathways to health and health disparities and to find solutions that improve health more effectively.

A departmental working group led by Hayden Bosworth, PhD, professor in population health sciences and vice chair of education, designed master’s and doctoral programs that beginning in fall 2019 and fall 2021, respectively, will offer new population health scientists that deep and diverse preparation. After extensive review by faculty across Duke, the Provost, and the Academic Council, the University’s Board of Trustees approved the new graduate offerings on May 12, 2018.

The Master of Science degree in population health sciences will offer coursework to develop scientists capable of moving insights into practice. Master’s students will be able to choose electives within the department and from 48 cross-listed courses across Duke.

Dr. Bosworth also secured and launched the School of Medicine’s National Heart, Lung, and Blood Institute K12 research career development grant for clinical scientists. Dubbed DISCO – Dissemination and Implementation Science in Cardiovascular Outcomes – the grant offers junior researchers an opportunity to develop expertise in dissemination and implementation and work on translational research relevant to heart, lung, blood, or sleep disorders, drawing on a team of mentors from key disciplines.

Duke is one of only 10 institutions to receive the grant, which aims to reduce the lag time between research results and effective implementation. Jamie Hughes, PhD, and Helen Vilme, DrPH, are researching behavioral sleep interventions in older veterans and farm-to-university nutrition at historically black colleges and universities, respectively.

In June 2018, the department offered a two-day summer institute to introduce key concepts in implementation science, measurement science, and qualitative research methods. More than 50 people attended the inaugural event in Durham, which featured hands-on learning led by department faculty and staff, including Dr. Bosworth; Amy Corneli, PhD; Brian Perry, MPH; Bryce Reeve, PhD; Asheley Skinner, PhD; and Kevin Weinfurt, PhD.
TOP DOWN AND GROUND UP

COURTNEY VAN HOUTVEN, PHD
PROFESSOR IN POPULATION HEALTH SCIENCES
The Veterans Administration (VA) is the federal government’s second largest department and provides health care for more than 9 million veterans each year. Beyond the department’s staff of more than 375,000, more than 2 million family members and friends serve as caregivers for veterans using VA health care. Courtney Van Houtven, PhD, professor in population health sciences, is helping the VA’s leaders understand this vital, largely volunteer workforce from the top down and building support for those caregivers from the ground up.

“We get to do things that get used at the highest levels. We can offer an evidence-based perspective that can shift policy.”

As director of the VA Caregiver Support Program Partnered Evaluation Center (VA-CARES), Dr. Van Houtven leads a national evaluation of the Program for Comprehensive Assistance for Family Caregivers (PCAFC). Congress created the program in 2010 to provide services and education to caregivers of post-September 11 veterans – the first effort of its kind. Participants must meet a long list of eligibility requirements in part because they can be paid a stipend for their work with veterans. VA-CARES did a rapid analysis of the first three years of PCAFC support’s impact on cost of care, which the Secretary of Veterans Affairs cited in congressional testimony advocating for expansion of the assistance to pre-September 11 veterans.

“We get to do things that get used at the highest levels,” Dr. Van Houtven said. “We can offer an evidence-based perspective that can shift policy.” The growing demand on the VA to provide caregivers with more assistance has the department searching for effective interventions.

Dr. Van Houtven also leads a four-year implementation study to expand a four-session caregiver support program called HI-FIVES (Helping Invested Families Improve Veterans Experiences) that was initially developed through a randomized trial she carried out at the Durham VA Medical Center.

The study will work with eight VA medical centers around the country to deploy HI-FIVES through instructional materials and support offered by Dr. Van Houtven and her colleagues, everything from model relaxation exercises to start the one-hour sessions to videos. “It’s all implementation science,” Dr. Van Houtven said. “You’re using existing clinical staff at each center to deliver the program.” Four sites have begun implementation, with another four being recruited. Approximately 320 caregivers will participate in the study across the eight sites.

The most apparent value of HI-FIVES has been on caregivers’ perceptions, Dr. Van Houtven said. Participants felt less alone and more aware of others facing similar challenges. Given the prevalence of depression and burnout among caregivers, that sense of community can be important. The VA’s benefit comes from participants’ increased satisfaction with care offered patients and caregivers, an increase of a half point on a 10-point scale, Dr. Van Houtven said. The hope is HI-FIVES will offer caregivers links to other existing assistance such as dementia support, telephone peer groups, and annual 30-day “respites” to which any caregiver is entitled. “There are so many resources in the VA, but it’s big and complicated for caregivers to find them,” she said.
CORE CAPACITY

CHRISTINA ZIGLER, PHD
ASSISTANT PROFESSOR IN POPULATION HEALTH SCIENCES

KEVIN WEINFURT, PHD
PROFESSOR IN POPULATION HEALTH SCIENCES AND VICE CHAIR OF RESEARCH

THERESA COLES, PHD
ASSISTANT PROFESSOR IN POPULATION HEALTH SCIENCES

BRYCE REEVE, PHD
PROFESSOR IN POPULATION HEALTH SCIENCES AND DIRECTOR OF THE CENTER FOR HEALTH MEASUREMENT
Health care needs better measurement tools to inform decisions in clinical research and delivery. Understanding the essential role of measurement, the Department of Population Health Sciences launched the Center for Health Measurement (CHM), whose mission is to direct and facilitate the design and use of patient-centered measures for improving research and enhancing patient care.

“We should measure outcomes that are most important to patients and are treatable by clinicians to improve patients’ quality of life,” said Bryce Reeve, PhD, who joined Duke in July 2017 to lead the CHM with co-director Kevin Weinfurt, PhD, the department’s vice chair of research. Dr. Reeve is an internationally recognized leader in patient-centered outcomes measurement and has been instrumental in the development of large-scale National Institutes of Health initiatives, including the Patient-Reported Outcomes Measurement Information System® (PROMIS®) and the Patient-Reported Outcomes version of the Common Terminology Criteria for Adverse Events (PRO-CTCAE).

The CHM has been building Duke’s capacity to meet the demand for measurement expertise. Theresa Coles, PhD, joined Duke as an assistant professor in population health sciences after working with RTI Health Solutions for nearly a decade overseeing a portfolio of research using patient-reported outcomes (PROs) for regulatory trials. At Duke, Dr. Coles’ work will focus on use of PROs in clinical practice settings to inform communication and decision making. Christina Zigler, PhD, an assistant professor in population health sciences recruited from the University of Pittsburgh, focuses on assessing patient-centered outcomes in rare disease pediatric populations.

That capacity, which differentiates the School of Medicine from most peers, has been recognized on and off the Duke campus. For example, the School of Medicine’s Divisions of Urology and Urogynecology are collaborating with the CHM to develop better ways to assess self-reported lower urinary tract symptoms, in the hopes of using these assessments to identify clinically meaningful subgroups of patients.

The Foundation for Angelman Syndrome Therapeutics sought out Duke’s expertise to develop better measures of communication ability in children with the disease to improve evaluation of emerging therapies. Dr. Reeve is working with Laura Schanberg, MD, of the Duke Clinical Research Institute to validate the PROMIS measures in pediatric populations of rheumatic diseases, cancer, and inflammatory bowel disease.

The interaction with clinicians and range of therapeutic areas involved is unprecedented, Dr. Weinfurt observed. “An appreciation for the value of having dedicated measurement experts has been evolving at Duke, and at this point we’re very engaged with a lot of our clinical colleagues,” he said. In addition, the CHM sponsors seminars and discussions to enhance measurement in research and to identify knowledge gaps that could drive future collaborations.

“We should measure outcomes that are most important to patients and are treatable by clinicians to improve patients’ quality of life.”

He recently served as president of the International Society for Quality of Life Research (ISOQOL). Dr. Weinfurt was a principal investigator in the PROMIS network, leading the development of the SexFS to measure sexual function and satisfaction, served as president of the PROMIS Health Organization, and serves on ISOQOL’s Board of Directors.
HELP TO ASK BETTER QUESTIONS

HILARY A. CAMPBELL, PHARMD, JD
RESEARCH ASSOCIATE AT DUKE-MARGOLIS CENTER FOR HEALTH POLICY

AARON McKETHAN, PHD
ASSISTANT PROFESSOR IN POPULATION HEALTH SCIENCES
North Carolina’s Medicaid program pays for more than half of the births in the state each year. Yet, of the 58,159 births in 2017 for which Medicaid paid for both prenatal care and delivery, nearly 18,000 (31%) involved mothers who do not receive assistance from the Special Supplemental Nutrition Program for Women, Infants, and Children, a federal program commonly known as WIC that has nearly identical income eligibility requirements as Medicaid. But the North Carolina Department of Health and Human Services (NCDHHS) has not had data and technology to routinely identify unserved mothers who qualify to get them signed up for the aid.

Aaron McKethan, PhD, assistant professor in population health sciences, uses this example to explain the many opportunities NCDHHS has for tapping data in innovative ways to benefit people served by programs addressing health, nutrition, foster care, and welfare. “We have many programs to help low-income and vulnerable people with prenatal care, postnatal care, and pediatric care, yet we have not had data systems to ensure that a mom delivering a new baby has enough food in her house,” he said. “We can use data in specific ways to make a bigger human impact.”

“We’re changing the business problem” in a way that increases demand for better use of a wider array of data to streamline services and meet the needs of program recipients.

Dr. McKethan’s interest in the transition is more than academic. Duke agreed to let him serve as the state department’s Chief Data Officer for 12 months at the request of NC DHHS Secretary Mandy Cohen, MD. In the role, he worked to design strategies to dismantle data siloes and rethink NCDHHS’ analytic agenda.

“The most important contribution the university can make to the state is to help it ask the right questions of data,” Dr. McKethan said. One example: under McKethan’s leadership, the department convened a May 2018 meeting among 75 experts from within NC DHHS, from universities, and from the private sector to map questions that could help North Carolina respond to the opioid epidemic, which kills nearly four people per day. The aim was not to share what the experts already knew about the crisis, but instead to clarify what is unknown. This was used to develop a set of high-impact research questions on which NCDHHS and scholars should focus to inform specific policies or programs. The group initially wrote about 150 questions, which have been distilled to a few dozen, Dr. McKethan said.

As a part of Dr. McKethan’s data strategy, NCDHHS agreed to share North Carolina Medicaid claims data with researchers at Duke. Now that Dr. McKethan is back on campus, he and other colleagues are mining this data to answer some of the high-priority opioid-related questions that can inform policy. While Duke becomes only the second such data repository in the state, the agreement also anticipates other forms of data flowing to Duke to support policy-relevant research that can benefit the state, Dr. McKethan said.

His time as a state official gave him important perspective on the translation of research to government policy and practice, Dr. McKethan said. Rather than assume researchers know what questions a state agency needs answered, researchers should study the specific policy decisions and alternatives policymakers face, and craft research to inform these decisions. Given the benefits that both NCDHHS and Duke received from his service, he hopes it will lead to a more formal process to embed other faculty members to contribute Duke’s intellectual assets to the work of other government agencies.

“The most important contribution the university can make to the state is to help it ask the right questions of data.”
COUNTY BY COUNTY, CHILD BY CHILD

ASHELEY SKINNER, PHD
ASSOCIATE PROFESSOR IN POPULATION HEALTH SCIENCES
The day that Asheley Skinner, PhD, started at Duke two and a half years ago, she and Sarah Armstrong, MD, sat down to write a grant together. Both childhood obesity researchers, Dr. Skinner, associate professor in population health sciences, and Dr. Armstrong, associate professor of pediatrics, had met at conferences and were eager to collaborate.

Dr. Skinner sees it as an essential element of population health sciences – bringing diverse expertise to a complex question. “Sarah and I co-lead everything,” she explained. “There’s almost nothing we both can do.”

They are working now to bring an obesity intervention called Bull City Fit created in partnership with the Durham Parks and Recreation Department to six sites around North Carolina (including Cumberland, Montgomery, Rowan, Wake, and Wayne Counties and a second Durham location).

“The first expansion site opened in Montgomery County in central North Carolina. There was apprehension about attendance because the county has no local pediatrician; Bull City Fit participants are referred by clinicians. Forty children attended on the opening night. In sites just getting underway, physicians already have begun referring children. “There’s all this pent-up need,” Dr. Skinner explained. She knows that need well as she leads a national study of the prevalence of childhood obesity.

The most recent report drew significant attention in early 2018 because it found that obesity has not been declining as widely reported in recent years and has in fact increased among children ages two to five. The prevalence noted by the national surveys she analyzes reinforce the need for programs like Bull City Fit, renamed ARCHES (Active Recreation through Community and Health Care Engagement Study) for its expansion beyond Durham, Dr. Skinner said.

To support the six new sites, the Duke team gives them a “backpack” of resources – a “trail guide” and “maps” that detail how to organize and carry out the program – along with onsite training. The program addresses many needs informed by Duke research, from cooking lessons to impart practical preparation skills and expand palates to structures to eliminate bias that overweight children routinely face outside the program from peers and popular culture “We’re fighting an entire environment,” Dr. Skinner said. “These kids in a whole, wide world.”

“Our big question is can you do this somewhere other than Duke,” Dr. Skinner explained. “This” is a program that involves weight management, physical activity, and healthy living education for children, teens, and in some places their families.

In Durham, the program has led to more activity, lower HDL cholesterol, and better reported quality of life for participants when compared to like children served only through the clinical pediatric weight management program.
MISSION
The Duke Department of Population Health Sciences’ mission is to produce important insights, guide them into practice, and prepare the next population health scientists well to improve the health of communities everywhere.

VISION
The Duke Department of Population Health Science pursues better health brought about by our discovery, dissemination, and implementation of knowledge.

VALUES

INTEGRITY
We do science transparently, accountably, and respectfully.

IMPACT
We strive to solve problems that matter and measure ultimate success through improved health of populations.

RIGOR
We demonstrate curiosity, creativity, and depth that yield insights to advance our field.

DIVERSITY
We tap diverse expertise, ideas, and perspectives to collaborate across traditional academic, social, and organizational boundaries.