



Center for Health Incentives
& Behavioral Economics



ANNUAL REPORT



FY 2018-19

There is extensive research showing that it is important for people to take their medications, exercise, eat healthy food, get a good night's sleep, and quit smoking. And yet, despite all the evidence, we know people struggle with these actions. How do you motivate people to follow through and do what the evidence suggests would be in their long-term self interest?

CHIBE is at the forefront of looking at the psychological, emotional, economic, and social factors and testing what drives our behavior and how to effect real, lasting change. Examining how patients and clinicians act and how we might nudge them to make better decisions is one of the most important and direct ways to change health outcomes.

Whether it was through our examinations into different types of financial incentives, our research on taxes on artificially sweetened beverages in Philadelphia, or our advising the Surgeon General Vice Admiral Jerome M. Adams, CHIBE has worked hard this year to determine how we can improve population health.

In FY 19, our affiliated faculty grew, won awards, and were placed on influential committees and commissions. Our signature programs expanded and offered new opportunities, like the Penn Medicine Nudge Unit's inaugural Nudge Units in Health Care Symposium, which was attended by executives and leadership from 22 health systems across the United States and Canada. Also, this year's signature program spotlight on pages 14 and 15 is on our Way to Health platform, which has now supported more than 137 research trials and clinical deployments on connected health at more than 25 universities.

We also invite you to take a look at What People Are Saying About CHIBE on pages 8 and 9. You will find a variety of voices from our internal and external advisory boards and from our affiliated faculty extolling the work CHIBE is doing.

Stay apprised of our work throughout the year on our website, through our monthly Healthy Nudge newsletter, or on our Twitter account @PennCHIBE. We thank you for your continued support, interest, and contributions. We look forward to another year of striving to most effectively use the science of behavioral economics to design and test ways to improve people's health.



KEVIN VOLPP, MD, PHD

Director, CHIBE

Founders President's Distinguished Professor, Perelman School of Medicine and the Wharton School

Health Policy Division Chief, Department of Medical Ethics & Health Policy, Perelman School of Medicine

ALISON BUTTENHEIM, PHD, MBA

Interim Director, Associate Director, CHIBE

Patricia Bleznak Silverstein and Howard A. Silverstein Endowed Term Chair, Global Women's Health

Associate Professor of Nursing, Department of Family and Community Health, School of Nursing

Associate Professor of Health Policy, Division of Health Policy, Perelman School of Medicine

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ABOUT OUR CENTER

Drawing on the expertise of faculty from across the University of Pennsylvania and beyond, the Center for Health Incentives and Behavioral Economics (CHIBE) conducts behavioral economics research aimed at reducing the disease burden from major public health problems. Originally founded within the University's Leonard Davis Institute of Health Economics, our mission is to use behavioral economics to generate knowledge and develop interventions that lead to better health and higher value health care.

As one of just two original NIH-funded Centers in Behavioral Economics and Health in the United States, CHIBE has three primary goals:

- To advance the science, knowledge, and application of behavioral economic interventions
- To train the next generation of leaders in the field
- To engage private and public sector partners to develop and test scalable and cost-effective applications

The Center has successfully conducted many observational studies and randomized trials testing principles of behavioral economics in a wide variety of clinical, employer, and health plan contexts that have resulted in programs benefitting tens of millions of patients nationally.



CENTER LEADERSHIP



Kevin Volpp, MD, PhD
Director



Alison Buttenheim, PhD, MBA
*Interim Director,
Associate Director*



Jalpa Doshi, PhD
Associate Director



Joelle Friedman, MPA
Managing Director



Scott Halpern, MD, PhD, MBE
Director, FIELDS Program



George Loewenstein, PhD
Director, Roybal Pilot Program



Amol Navathe, MD, PhD
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*Assistant Director for Research
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Mitesh Patel, MD, MBA, MS
*Director, Penn Medicine
Nudge Unit*



Christina Roberto, PhD
Director, PEACH Lab



Meghan Ross
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Associate Director

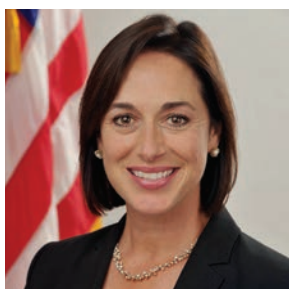


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Assistant Director, Data Analytics

EXTERNAL ADVISORY BOARD



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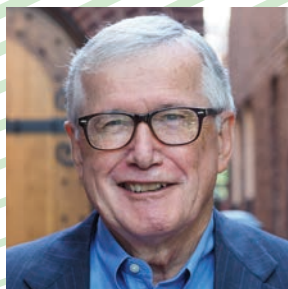
Mark Smith, MD, MBA
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University of Pennsylvania Health System



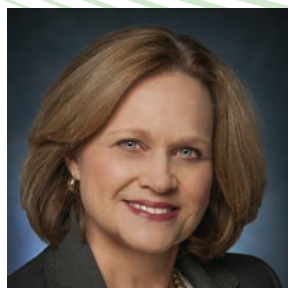
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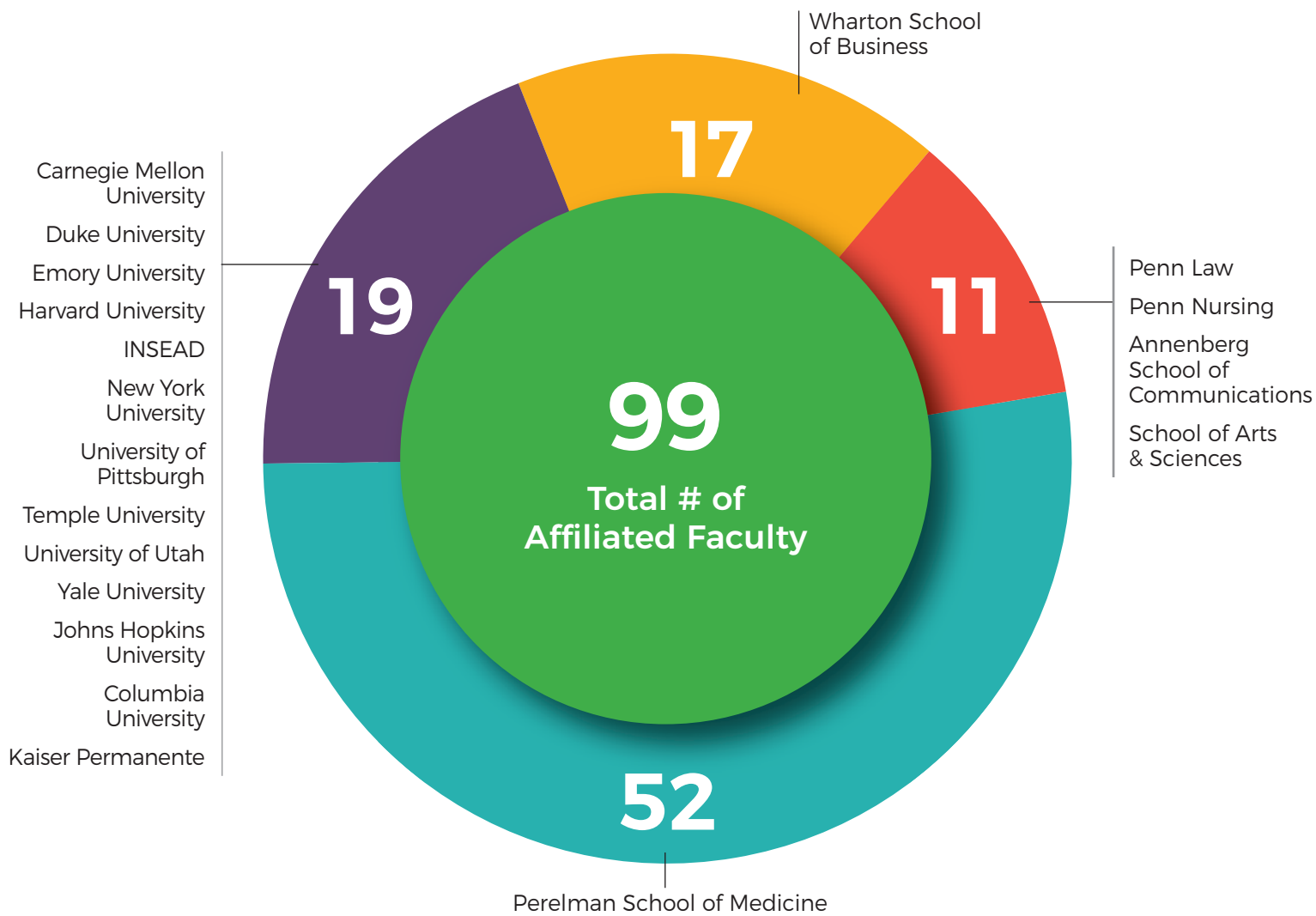


Lynn Schuchter, MD
Perelman School of Medicine



Sankey Williams, MD
Perelman School of Medicine

BY THE NUMBERS



153
H-INDEX
for CHIBE-
authored articles

593
2018 CHIBE-
AUTHORED
ARTICLES

40,180
2018
CITATIONS

AWARDS AND RECOGNITION



2018 Michael P. O'Donnell Paper of the Year
American Journal of Health Promotion
Leslie John, PhD
Andrea Troxel, ScD



(additional authors)
William S. Yancy, Jr, MD;
Joelle Friedman, MPA;
Jingsan Zhu, MBA, MS;
Robert Galvin, MD, MBA;
Scott D. Halpern, MD, PhD;
George Loewenstein, PhD;
Kevin Volpp, MD, PhD



2019 Best Published Research Paper of the Year
Society of General Internal Medicine
Atheendar Venkataramani, MD, PhD



2019 John M. Eisenberg National Award for Career Achievement in Research
Society of General Internal Medicine
2019 Award for Distinguished Contributions to Behavioral Medicine
American College of Physicians
Kevin Volpp, MD, PhD



2018 Robert Wood Johnson Foundation David E. Rogers Award
Association of American Medical Colleges
2019 Distinguished Investigator Award for Translation into Public Benefit and Policy
Association for Clinical and Translational Science
David A. Asch, MD, MBA



2019 Young Physician-Scientist Award
American Society for Clinical Investigation
Mitesh Patel, MD, MBA, MS



Appointed to Medicare Payment Advisory Commission (MedPAC)
Amol Navathe, MD, PhD



Elected into Association of American Physicians
Scott Halpern, MD, PhD, MBE



Appointed to the National Academies of Sciences, Engineering, and Medicine's Committee on Evidence-Based Clinical Practice Guidelines to Prescribing Opioids for Acute Pain
(his second NASEM committee appointment)
Kit Delgado, MD, MS



Patricia Bleznak Silverstein and Howard A. Silverstein Endowed Term Chair, Global Women's Health
University of Pennsylvania School of Nursing
Alison Buttenheim, PhD, MBA

“The best part about CHIBE is the opportunity to learn from and collaborate with brilliant mentors and colleagues outside my clinical specialty and launch innovative work with the help of pilot grant support.”

— Kit Delgado, MD, MS
*Faculty member, Perelman School of Medicine
University of Pennsylvania*

“Thanks to CHIBE’s funding sources and connections, I’ve been able to do vastly more impactful research on health behavior change than I had ever hoped to prior to joining the Penn faculty and CHIBE community.”

— Katherine L. Milkman, PhD
*Faculty member, Wharton School
University of Pennsylvania*

“CHIBE has been pivotal in my growth as an early-career investigator, including providing me with direct funding support through pilot grants and inspiration through my inclusion in its community of innovative and passionate researchers.”

— Joanna Hart, MD, MSHP
*Faculty member, Perelman School of Medicine
University of Pennsylvania*

“CHIBE’s work sits at the very core of society’s pursuit of health, aiming to understand and augment the motivations that shape health-seeking or health-avoiding behaviors.”

— Mitchell J. Blutt
Consonance Capital

“CHIBE is tackling some of the most prevalent and important public and population health challenges and brings together scientists from a wide range of backgrounds, united in the belief that most health challenges are thwarted by behaviors that are resistant to change. Adopting an agile mindset that bridges academia and real-world medical practice, CHIBE tests its theories of behavioral economics fearlessly. CHIBE’s work has also converted health care leaders across industries to integrate its tools into their practices, achieving a real multiplier effect!”

— Vivian Lee, MD, PhD, MBA
Verily



WHAT PEOPLE ARE SAYING ABOUT CHIBE

“CHIBE’s work is the most trusted voice at the cutting edge of one of the most important issues in health care—how to help people make healthy choices—and uses well-designed research to develop approaches to help people help themselves.”

— Robert Galvin, MD, MBA
The Blackstone Group

“CHIBE sets the evidence-based standard on what works and what doesn’t in health incentives, allowing providers, insurers, and employers to use practices that actually deliver.”

— David P. Kirchhoff, MBA
iFLY

“Being a CHIBE member provides me opportunities to interact with colleagues who focus on the basic decision process mechanisms that underlie health outcomes in real-world settings.”

— Gretchen Chapman, PhD
Faculty member, Carnegie Mellon University

“I admire CHIBE for actively seeking practical solutions to some of today’s most challenging public health concerns through innovative research and collaboration that focus on improving value and quality of care.”

— Rebekah E. Gee, MD, MPH, MHSR
Louisiana Department of Health



“CHIBE brings together a wide range of stakeholders focused on testing and implementing innovative approaches to improve health and health care. This network has created many opportunities for my research endeavors and created a platform by which the evidence we generated can be disseminated to key stakeholders for implementation.”

— Mitesh Patel, MD, MBA, MS,
*Faculty member, Perelman School of Medicine and Wharton School,
University of Pennsylvania*

SIGNATURE PROGRAMS



PENN ROYBAL CENTER

In 2009, CHIBE Director Kevin Volpp, MD, PhD, collaborated with George Loewenstein, PhD, at Carnegie Mellon University and successfully competed for NIH funding to establish the Penn CMU Roybal Center on Behavioral Economics and Health (now the Penn Roybal Center on Behavioral Economics and Health). This program is supported by a P30 center grant from the National Institute on Aging to conduct translational research in older populations. When created, CHIBE was one of 13 Roybal Centers in the United States — and 1 of 2 focused on behavioral economics and health. Our center specializes in research and dissemination strategies that foster the translation of behavioral economic theories to improve health behaviors and health care delivery in older adults.

Over the years, the Penn Roybal Center has distributed roughly \$1.1 million in pilot funding for projects testing interventions aimed at middle-aged and elderly Americans at high risk for premature morbidity and mortality. This year, we funded three pilot projects on how to foster better sleep habits, approaches to improve screening for liver cancer, and interventions to decrease sodium intake among patients with cirrhosis.

Each year, our center holds a Roybal Retreat for the CHIBE faculty, trainees, and staff. In FY 2019, we held our largest-ever Roybal Retreat in the Poconos, with 116 faculty, trainees, and staff participating.

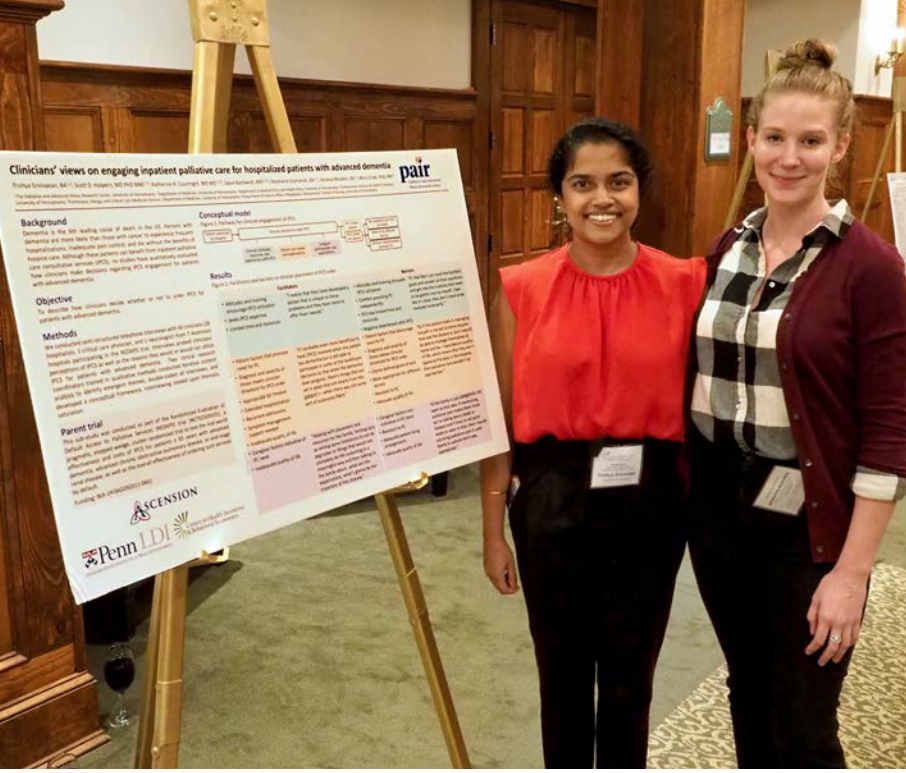
PENN NIMH ALACRITY P50 CENTER

The National Institutes of Mental Health (NIMH) Advanced Laboratories for Accelerating the Reach and Impact of Treatments for Youth and Adults with Mental Illness (ALACRITY) supports an ALACRITY Center at Penn to facilitate the rapid development, testing, and refinement of novel and integrative approaches for (1) optimizing the effectiveness of treatments for and prevention of mental disorders; and (2) organizing and delivering mental health services in community settings. Three principal investigators lead the center: Rinad Beidas, PhD, David Mandell, ScD, and Kevin Volpp, MD, PhD. Alison Bittenheim, PhD, MBA, has served as multiple principal investigator while Dr. Volpp is on sabbatical.

The Penn ALACRITY Center, a partnership between CHIBE and the Penn Center for Mental Health, was in the first cohort of these centers to be funded in the nation. It combines principles of behavioral economics and implementation science to improve mental health service delivery. In addition to specific research projects, the center supports the development of



novel statistical methods and study designs to increase our knowledge of what contributes to successful implementation of evidence-based mental health treatments and tests ways to leverage this knowledge to increase the quality of mental health care and outcomes.



THE FIELDS PROGRAM

Directed by Scott Halpern, MD, PhD, MBE, the Fostering Improvement in End-of-Life Decision Science (FIELDS) program is the world's first research program dedicated to using principles of behavioral economics to understand and improve upon the end-of-life decisions made by patients, caregivers, and clinicians. A core program of CHIBE and the Palliative and Advanced Illness Research (PAIR) Center, FIELDS was established in 2012 with development funding from the Otto Haas Charitable Trust. FIELDS investigators are conducting studies ranging from small pilot projects to mixed methods research, and multi-year pragmatic trials within large health systems around the country.

SIGNATURE PROGRAMS



BEHAVIORAL SCIENCE AND HEALTH ANNUAL SYMPOSIUM

This year marked CHIBE's eighth annual Behavioral Science and Health Symposium. Over 75 leading academics came to the Penn campus to discuss cutting-edge research in health-applied behavioral economics and goals for advancing the field forward. Keynote speakers have included many of the most influential and leading figures in the field nationally and internationally.



CLINICAL TRANSLATIONAL SCIENCE PILOT AWARD PROGRAM

The Institute for Translational Medicine and Therapeutics (ITMAT), part of the University of Pennsylvania Clinical Translation and Science Award Community and Collaboration Core, supports CHIBE's Clinical Translational Science Pilot Award Program. As part of this program, CHIBE solicited proposals for pilot projects addressing 1) increasing enrollment in clinical trials and 2) improvement of health outcomes or health behavior through the use of connected health interventions. CHIBE awarded 10 projects totaling \$437,148 in funding

across both pilot programs this fiscal year. We were able to provide use of the Penn Way to Health software platform (for more information see pages 14-15) free to applicants through funding support from ITMAT, in addition to a gift from the Otto Haas Charitable Trust. The awarded teams were comprised of investigators from the Perelman School of Medicine, the Wharton School, and the Children's Hospital of Philadelphia, with each of the teams including at least one inter-school collaboration.



PENN MEDICINE NUDGE UNIT

Launched with support from CHIBE and the Penn Medicine Center for Health Care Innovation, the Penn Medicine Nudge Unit is the world's first behavioral design team embedded within the operations of a health system. The team's mission is to leverage insights from behavioral economics and psychology to design and test approaches to steer medical decision-making and daily health behaviors toward higher value and improved patient outcomes. Since launching in 2016, the team has worked on more than 50 projects including nudging clinicians, nudging patients, predicting decision-making and health behaviors, and behavioral phenotyping. Many of these projects have been scaled either throughout Penn Medicine or implemented in other health systems. In 2018, the team held the Inaugural Nudge Units in Health Care Symposium on the University of Pennsylvania campus (see picture below). This event was attended by executives and leadership from 22 health systems across the United States and Canada who were interested in developing their own nudge unit.

PSYCHOLOGY OF EATING AND CONSUMER HEALTH (PEACH) LAB

The mission of The **Psychology of Eating and Consumer Health** (PEACH) lab is to identify innovative policies and interventions to promote healthy eating habits and prevent nutrition-related chronic diseases. This year the lab published a significant study in the *Journal of the American Medical Association* demonstrating that Philadelphia's 1.5 cent per ounce sweetened beverage tax led to a 38% reduction in sales of taxed beverages one year after the tax. These findings provide important evidence that sweetened beverage taxes may be one of the most effective policy tools to decrease consumption of sugary drinks. The lab also received two different grants this year from the Robert Wood Johnson Foundation to develop and test counter marketing messages to dissuade parents from serving their children high-sugar fruit drinks.

We also successfully launched an NIH-funded R01 study testing the influence of a behavioral economic intervention deployed through an online ordering system at a local food pantry. The goal of this work is to promote healthy food choices among a high-need population with limited resources. We have also completed the first year of an NIH-funded R01 study that enabled us to randomize vending machines across Philadelphia to different health-promoting messages.



SIGNATURE PROGRAM SPOTLIGHT

WAY TO HEALTH

About a decade ago, CHIBE Director Kevin Volpp and Executive Director of the Penn Medicine Center for Health Care Innovation David Asch were frustrated that there was no platform to quickly develop, test, and scale their ideas related to behavioral economics. They wanted a tool that could assess patient engagement and behavioral economics-based interventions and see how they affected health outcomes. Out of this frustration (and thanks to NIH seed money), Way to Health was born.

Now, Way to Health offers an efficient, low-cost way to conduct randomized controlled trials with many automated functions. It's been used for 137 projects, engaging more than 60,000 patients, and not only is the default program for behavioral economics studies at the University of Pennsylvania, it is also used by leading research and clinical organizations such as CHOP, Duke, Harvard, Cornell, and a large health insurer.

THE SKY'S THE LIMIT

Way to Health is incredibly flexible, allowing researchers to mix and match modules from the suite of available tools to personalize interventions. The platform is built to accommodate the needs of small pilot studies, large research studies, and clinical roll-outs. Available functions include:

- Automated consent, enrollment, and randomization
- Choice of a variety of communication mediums (texting, emails, surveys, etc)
- Integration of devices with seamless and easy data capture
- A library of behavioral economics tools, such as social and financial incentives to nudge or change behavior that are pre-programmed and easy to modify
- Gamification techniques to engage patients
- Simple or complex rules to test various interventions, and trigger actions by time or data captured from patients
- Natural language understanding techniques for communication with patients



CUTTING-EDGE TECHNOLOGY WITH AN EYE ON THE FUTURE

Way to Health integrates directly with a number of biomedical devices to capture vitals directly from patients. Fitbit, Misfit, Omron, and iHealth are just a few of the devices that are already integrated, and additional devices can be added. The platform also provides bi-directional integration with EPIC (and additional EHRs on request).

Way to Health also uses intelligent chatbots that understand how patients truly speak, and the platform has recently become internationalized so that researchers can deploy a project in multiple languages.

Way to Health also has an eye on the future, providing subsidized support to young researchers who want to quickly try out innovative ideas. With nearly 10 years on the ground, Way to Health offers the expertise to help guide what happens from Day 1 to Day 365. Not simply a tech platform, Way to Health is a partner to researchers with the shared goal of reducing the time it takes for interventional research to be applied in specific patient contexts.

WAY TO HEALTH APPLIES BEHAVIORAL ECONOMICS TO HEALTH CARE AND IS FOCUSED ON APPLYING LESSONS LEARNED TO IMPROVE PATIENT ENGAGEMENT.



CASE STUDY

PRE-ECLAMPSIA

HEART SAFE MOTHERHOOD

Sindhu Srinivas, MD, MSCE; Adi Hirshberg, MD; Katy Mahraj, MSI

Tested whether text-based remote monitoring of blood pressure could drive better maternal outcomes, improve the care experience, and reduce the total cost of care for women with pregnancy-related and chronic hypertension in the immediate postpartum period.

WAY TO HEALTH USES

- Used two-way texting for reminders and also to receive blood pressure data
- Implemented a clinician-designed algorithm to detect abnormalities for follow-up
- Created alerts to providers or other care providers in case of high blood pressure
- Facilitated two-way integration to EPIC to auto-enroll patients into the program and push data back into the patient flowsheet

OUTCOMES

- Increased guideline adherence by 80%
- Reduced 7-day readmission by 80%
- Improved patient care experience (led to 98% patient satisfaction rate)
- Created a national leadership model to meet American College of Obstetricians and Gynecologists guidelines

Adi Hirshberg, Katheryne Downes, and Sindhu Srinivas. Comparing Standard Office-Based Follow-Up with Text-Based Remote Monitoring in the Management of Postpartum Hypertension: A Randomised Clinical Trial. *BMJ Quality & Safety*. 2018.





HEALTHY BEHAVIORS

Our investigators conduct research to understand the behavioral factors that influence food choice, medication adherence, physical activity, and smoking cessation, among other behaviors.

FY 2019 PUBLICATION HIGHLIGHTS

Use of Financial Incentives and Text Message Feedback to Increase Healthy Food Purchases in a Grocery Store Cash Back Program: A Randomized Controlled Trial.

Anjali Gopalan, Pamela A. Shaw, Raymond Lim, Jithen Paramanund, Deepak Patel, Jingsan Zhu, Kevin G. Volpp, and Alison M. Buttenheim. *BMC Public Health*.

Taxes and Front-Of-Package Labels Improve the Healthiness of Beverage and Snack Purchases: A Randomized Experimental Marketplace.

Rachel B. Acton, Amanda C. Jones, Sharon I. Kirkpatrick, Christina A. Roberto, David Hammond. *International Journal of Behavioral Nutrition and Physical Activity*.

The Uncertain Effect of Financial Incentives to Improve Health Behaviors.

Harsha Thirumurthy, David A. Asch, Kevin G. Volpp. *JAMA*.

FY 2019 NEW PROJECT HIGHLIGHTS

Be Active

Principal Investigators

Kevin Volpp, MD, PhD; Mitesh Patel, MD, MBA, MS

Funder: National Heart, Lung, and Blood Institute

Regular physical activity has been shown to reduce the risk of atherosclerotic cardiovascular disease (ASCVD), but less than 50% of U.S. adults achieve enough physical activity to obtain these benefits. The objective of this study is to use a randomized controlled trial to test the effectiveness of using behaviorally designed gamification, loss-framed financial incentives, or both to increase physical activity among patients with elevated risk for ASCVD. This extends work done in a successful pilot, the first intervention study done with the Framingham Heart Cohort.

Comparing Smoking Cessation Interventions Among Underserved Patients Referred for Lung Cancer Screening

Principal Investigators

Scott Halpern, MD, PhD, MBE; Joanna Hart, MD, MSHP

Funder: The Patient-Centered Outcomes Research Institute

This is the largest study to date comparing different ways to help underserved patients who receive lung cancer screening stop smoking. The goal of this trial is to understand which interventions work best to help underserved patients quit smoking. This study also evaluates if different interventions work better for specific groups; for example, for people of different races, ethnicities, incomes, and degrees of tobacco dependence.

— FY 2019 NEWS — HIGHLIGHTS

Forbes Paying People To Lower Their Cholesterol Works But Is It Cost Effective?

Forbes, September 2018

WHYY Black and Hispanic Americans Have a Harder Time Quitting Cigarettes: Will This Penn Study Find a Way to Help?

WHYY, December 2018

The Philadelphia Inquirer Anti-Vaccine Parents Are Often White, College-Educated, 'Whole Foods Moms'

The Philadelphia Inquirer, April 2019

The Washington Post A Smarter Way to Think About Willpower

The Washington Post, April 2019

TIME Soda Taxes Are a 'No Brainer' for Public Health, Says the Author of a New Study on Them

TIME, May 2019








HEALTH CARE DELIVERY

Our researchers explore innovative behavioral economic solutions to improve health outcomes while reducing costs through the transformation of health care delivery.

FY 2019 PUBLICATION HIGHLIGHTS

-  **Incentivizing Healthy Behaviors at Scale.** Joshua M. Liao, Amol S. Navathe. *JAMA Network Open*.
-  **Effect of Financial Incentives on Patient Use of Mailed Colorectal Cancer Screening Tests: A Randomized Clinical Trial.** Shivan J. Mehta, Rebecca S. Pepe, Nicole B. Gabler, Mounika Kanneganti, Catherine Reitz, Chelsea Saia, Joseph Teel, David A. Asch, Kevin G. Volpp, Chyke A. Doubeni. *JAMA Network Open*.
-  **Transforming Mental Health Delivery Through Behavioral Economics And Implementation Science: Protocol For Three Exploratory Projects.** Rinad S. Beidas, Kevin G. Volpp, Alison M. Buttenheim, Steven C. Marcus, Mark Olfson, Melanie Pellecchia, Rebecca E. Stewart, Nathaniel J. Williams, Emily M. Becker-Haimes, Molly Candon, Zuleyha Cidav, Jessica Fishman, Adina Lieberman, Kelly Zentgraf, David Mandel. *JMIR Research Protocols*.

FY 2019 NEW PROJECT HIGHLIGHTS

Behavioral Economics and Population-based Colorectal Cancer Screening

Principal Investigator
Shivan Mehta, MD, MBA

Funder: *National Cancer Institute*

Recent studies from behavioral economics show that we can harness ways that humans are predictably irrational to overcome inertia and increase health promoting behavior like screening for colorectal cancer, which is the second-leading cause of cancer death. This is a pragmatic trial that incorporates principles of behavioral economics and consumer marketing to increase participation in screening colonoscopy and reduce the burden of colorectal cancer in that population.

Parents Quit IT: Tailored Messaging and Decision Support to Help Parents Quit Smoking in Pediatric Settings

Principal Investigator
Brian Jenssen, MD, MSHP

Funder: *National Cancer Institute of the National Institutes of Health*

Secondhand smoke exposure affects more than 40% of the U.S. pediatric population and exacerbates and/or increases the risk of disease morbidity and mortality. This project entails developing theory-based messages that engage parents in tobacco cessation treatment, identifying effective methods for delivering these messages using clinical decision support tools, and measuring the impact of these messages on parent quit rates.

— FY 2019 NEWS HIGHLIGHTS —

-  **Using Behavioral Nudges to Treat Diabetes**
Harvard Business Review, October 2018
-  **Would You Take An At-Home Colon Cancer Test for \$10?**
The Philadelphia Inquirer, March 2019
-  **Doctor On Video Screen Told a Man He Was Near Death, Leaving Relatives Aghast**
The New York Times, March 2019
-  **Seriously Ill Children Often Resist Treatment. Can Offering Simple Rewards Change That?**
PBS NewsHour, April 2019
-  **Improving Health Care by Gamifying It**
Harvard Business Review, May 2019





DIGITAL HEALTH & WEARABLES

Researchers at CHIBE apply principles of behavioral economics to connected health through interventions that leverage CHIBE's Way to Health software platform, as well as wearable fitness trackers and apps.

FY 2019 PUBLICATION HIGHLIGHTS

- Gamification Use and Design in Popular Health and Fitness Mobile Applications.** Victor Cotton, Mitesh S. Patel. *American Journal of Health Promotion.*
- Cost-effectiveness of Financial Incentives for Patients and Physicians to Manage Low-Density Lipoprotein Cholesterol Levels.** Ankur Pandya, David A. Asch, Kevin G. Volpp, Stephen Sy, Andrea B. Troxel, Jingsan Zhu, Milton C. Weinstein, Meredith B. Rosenthal, Thomas A. Gaziano. *JAMA Network Open.*
- Effect of an Automated Patient Dashboard Using Active Choice and Peer Comparison Performance Feedback to Physicians on Statin Prescribing: the Prescribe Cluster Randomized Clinical Trial.** Mitesh S. Patel, Gregory W. Kurtzman, Sneha Kannan, Dylan S. Small, Alexander Morris, Steve Honeywell Jr, Damien Leri, Charles A. L. Rareshide, Susan C. Day, Kevin B. Mahoney, Kevin G. Volpp, David A. Asch. *JAMA Network Open.*

FY 2019 NEW PROJECT HIGHLIGHTS

The Engage Trial

Principal Investigator
Mitesh Patel, MD, MBA, MS

Funder: CHIBE

Most wearables are preset to an immediate 10,000 daily step goal. Since people vary in their baseline and motivation, they may also vary in their response to different types of goal-setting. This is a 24-week clinical trial among patients with elevated risk for cardiovascular disease to compare four different methods of goal-setting in a gamification intervention.

Leveraging Social and Sexual Networks to Reach Young Men with HIV Testing and Linkage Services

Principal Investigator
Harsha Thirumurthy, PhD

Funder: Bill and Melinda Gates Foundation

This project uses insights from behavioral economics and mHealth-based interventions to promote HIV testing among young men in South Africa. The goal is to conduct a series of short-duration pilots that identify promising approaches as well as implementation barriers that will either lead to "failing quickly," should the interventions prove not successful, or larger-scale tests in which both the ideas and the implementation approach are refined.

— FY 2019 NEWS — HIGHLIGHTS

 **Reuters** **Fitness Trackers' Accuracy Varies Widely for Calories Burned**
Reuters, October 2018

 **Psychology Today** **What's in a Wearable? Tracking Health and Performance**
Psychology Today, October 2018

 **The Philadelphia Inquirer** **Opioid Use Down for Spine Surgery Patients with New Penn Program**
The Philadelphia Inquirer, January 2019

 **Reuters** **Apple Watch Detects Irregular Heart Beat in Large U.S. Study**
Reuters, March 2019

 **WHYY** **Why We Can't Stop Using Our Phones While Driving**
WHYY, May 2019





HEALTH POLICY & FINANCING

Our researchers examine the impact of policy initiatives and shifts in health incentives on patient, clinician, and health system outcomes through a mixture of secondary data studies and experimental work.

FY 2019 PUBLICATION HIGHLIGHTS

➤ **Association of a Beverage Tax on Sugar-Sweetened and Artificially Sweetened Beverages With Changes in Beverage Prices and Sales at Chain Retailers in a Large Urban Setting.** Christina A. Roberto, Hannah G. Lawman, Michael T. LeVasseur, Nandita Mitra, Ana Peterhans, Bradley Herring, Sara N. Bleich. *JAMA*.

➤ **Effect Of Financial Bonus Size, Loss Aversion, And Increased Social Pressure On Physician Pay-For-Performance: A Randomized Clinical Trial And Cohort Study.** Amol S. Navathe, Kevin G. Volpp, Kristen L. Caldarella, Amelia Bond, Andrea B. Troxel, Jingsan Zhu, Shireen Matloubieh, Zoe Lyon, Akriti Mishra, Lee Sacks, Carrie Nelson, Pankaj Patel, Judy Shea, Don Calcagno, Salvatore Vittore, Kara Sokol, Kevin Weng, Nichia McDowald, Paul Crawford, Dylan Small, Ezekiel J. Emanuel. *JAMA Network Open*.

➤ **Experiences With Medical Exemptions After a Change in Vaccine Exemption Policy in California.** Salini Mohanty, Alison M. Bittenheim, Caroline M. Joyce, Amanda C. Howa, Daniel Salmon, Saad B. Omer. *Pediatrics*.

FY 2019 NEW PROJECT HIGHLIGHTS

Kentucky Population Survey on Medicaid Waiver Policy

Principal Investigators

Atheendar Venkataramani, MD, PhD; Kristen Underhill, JD, DPhil, MSc

Funders: Donaghue Foundation and Rx Foundation

The purpose of this study is to evaluate attitudes and beliefs in the general population around personal responsibility and Medicaid receipt, particularly as it relates to the Kentucky Section 1115 Waiver. This study compares differences between new Medicaid enrollees and the general population regarding the role of the state in health care and in beliefs, knowledge, and support for the program.

Specialist Transformation in Hawaii: The Design of Orthopedic, Oncology, and Cardiology Bundled Payment Programs

Principal Investigators

Amol S. Navathe, MD, PhD; Kevin Volpp, MD, PhD; Ezekiel Emanuel, MD, PhD

Funder: Hawaii Medical Services Association (HMSA)

This project develops new payment models for specialist care providers (orthopedic, oncology, and cardiology), implements randomized controlled trials, and evaluates the impact of incentive design features from classical and behavioral economics.

— FY 2019 NEWS — HIGHLIGHTS

The
New York
Times

A Health Insurer Tells Patients It Won't Pay Their E.R. Bills, But Then Pays Them Anyway
The New York Times, July 2018

Vox

One of Obamacare's Big Experiments to Lower Costs Is Working Surprisingly Well
Vox, September 2018

WHYY

Hospitals Could Play a Bigger Role in Preventing Gun Violence, Study Says
WHYY, January 2019

HealthLeaders

Bonus Pay for Doctors Can Boost Quality of Care
HealthLeaders, February 2019

HealthAffairs

Three Lessons From A Philanthropic Partnership To Expand Evaluation of the Kentucky HEALTH Medicaid Waiver
HealthAffairs, April 2019



FY 2019 IMPACT

RESEARCH THAT DRIVES ACTION

Director of the PEACH lab Christina Roberto, PhD, published a significant study showing that Philadelphia's 1.5 cent-per-ounce sweetened beverage tax led to a 38% drop in sales of the taxed drinks, one year after the tax. Upon publication of these findings, Dr. Roberto's work received widespread media coverage, and the City of Philadelphia was lauded locally, nationally, and globally for its efforts to lower sweetened drink consumption.



CHIBE Associate Director Amol Navathe, MD, PhD, was appointed by the U.S. Government Accountability Office as a new member of the Medicare Payment Advisory Commission (MedPAC). MedPAC is the primary advisory body for Congress on issues affecting the Medicare program and will also analyze access to care and quality of care, among other issues affecting Medicare.

Kit Delgado, MD, MS, an affiliated faculty member, and colleagues from CHIBE, Scott Halpern, MD, PhD, MBE; Kevin Volpp, MD, PhD; Roy Rosin, MBA; and Dylan Small, PhD; in partnership with Progressive Insurance, launched the largest-ever randomized trial of behavioral strategies to reduce distracted driving from cell phone use. In the span of 72 hours in May 2019, the team enrolled over 2,100 customers from across the United States in Progressive's Snapshot smartphone usage-based auto-insurance program to participate in the trial. This line of work was launched with funding from CHIBE's pilot grant programs.

The U.S. Government Accountability Office's report "Voluntary and Mandatory Episode-Based Payment Models and Their Participants" to Senator Ron Wyden, ranking member of the Senate Finance Committee, this December cited research by CHIBE Associate Director Amol Navathe, MD, PhD. Dr. Navathe was asked for his testimony on this subject.

CHIBE co-sponsored a number of policy-driven conferences this year, including the Behavioral Science and Policy Association's 5th Annual Conference, the Snowbird Health Summit, and a conference on distracted driving with Travelers Insurance. CBS Philly filmed a TV spot about this conference and interviewed Kit Delgado, MD, MS, and the Travelers' CEO was in attendance. CHIBE Director Kevin Volpp, MD, PhD, also co-organized the National Academies of Sciences, Engineering and Medicine's Workshop on Behavioral Economics and the Promotion of Health Among Aging Populations.

CHIBE Director Kevin Volpp, MD, PhD, CHIBE Interim Director and Associate Director Alison Buttenheim, PhD, MBA, and CHIBE faculty affiliate Kit Delgado, MD, MS, met with Surgeon General Vice Admiral Jerome M. Adams, MD, MPH, to discuss opportunities to improve population health. The Surgeon General invited ongoing involvement from CHIBE in his signature initiative, "Community Health and Economic Prosperity," with the specific goal of engaging businesses as change-makers and supporters of community health.



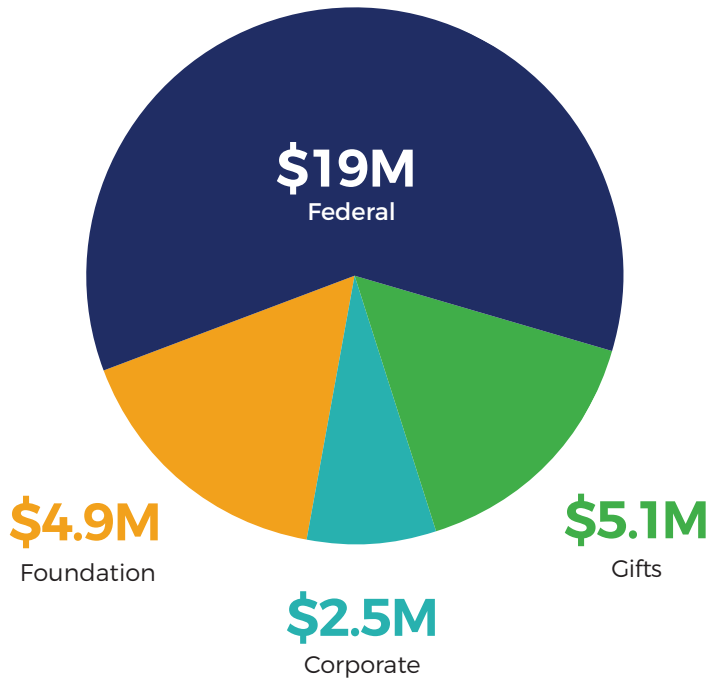
FUNDING PORTFOLIO

CHIBE receives project-specific funding from foundation, corporate, and federal sponsors. Diversification of our portfolio has been a strategic priority over the past several years, and we have been successful in securing funding from several commercial entities and foundations.

In addition, CHIBE receives support from the University of Pennsylvania Health System and the Perelman School of Medicine that has enabled us to make strategic investments, strengthen our infrastructure, and support junior faculty and trainees. We were also fortunate to receive two gifts from the Otto Haas Charitable Trust. The Otto Haas Charitable Trust gift has enabled us to strengthen the infrastructure of Way to Health, making it more accessible to junior faculty and trainees by increasing the ease of use and reducing the cost and also creating a CHIBE permanent endowment fund. We also received a generous 6-figure gift from an anonymous donor to establish a Director's innovation fund for the support of high priority, quick-turnaround initiatives.

\$124.4M
TOTAL AWARD FOR
FY19 ACTIVE PROJECTS

THE DISTRIBUTION FOR
FY19 GRANT ACTIVITY
IS AS FOLLOWS



OUR PARTNERS



FUTURE DIRECTIONS



In the coming year, CHIBE will continue to build on considerable progress being made in behavioral economics and health. We are excited by the energy and enthusiasm of existing faculty and staff and the many strong partnerships we have with collaborating organizations who share our goals of improving health and health care. We are pleased to welcome two new External Advisory Board members in the year ahead: Lisa Simpson, MB, BCh, MPH, FAAP, the President and CEO of AcademyHealth, and Jeffrey Kang, MD, MPH, former Chief Quality Officer of CMS, former CMO of Cigno, and former President of ChenMed, a privately held, scalable primary care practice that cares for the low- to moderate-income elderly.

One area of growth for CHIBE is in global health. Behavioral insights can be very useful for addressing “last mile” challenges, and when powerful and effective biological tools to combat

diseases exist, but they are not utilized widely, low-cost behavioral interventions can move the needle on utilization. CHIBE projects are applying this approach abroad to increase demand for services such as micronutrient supplements to reduce malnutrition, HIV testing, HIV prevention services, childhood vaccination services, and clean cooking technologies to reduce household air pollution overseas. We are also exploring ways to promote sustained behavior change when it comes to medication adherence and retention in care for chronic diseases.

We thank all of our collaborators for your efforts to support CHIBE faculty, trainees, and staff in the creation of new knowledge on how to most effectively use behavioral economic strategies to improve the health of populations. We look forward to working further with you to make resources spent on health and health services as impactful as possible.






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