



Center for Health Incentives
& Behavioral Economics



Annual Report FY 2016 - 2017



A Letter from our Director



I am delighted to share with you the annual report of the Center for Health Incentives and Behavioral Economics. Since CHIBE was founded within the University's Leonard Davis Institute of Health Economics in 2008, our faculty has generated an expansive range of behavioral insights that have been translated into health-improving programs in a wide range of private and public organizations. In just the past year, our investigators have published 349 peer-reviewed articles on topics ranging from medication adherence to mobile health and wearable technology to end-of-life care, while working on a wide range of efforts to improve population health.

In FY 2017, CHIBE was the recipient of a generous gift from the Otto Haas Charitable Trust, enabling our development team to strengthen the infrastructure and end-user interface of Way to Health, our software platform that automates many of the research functions necessary for conducting randomized controlled trials of behavioral interventions. CHIBE also created a number of new research collaborations with support from organizations such as Hawaii Medical Services Association, Advocate Health System, Caremore, Baptist Health System, Biogen, Novartis, PhRMA, the National University of Singapore, the Veterans Administration, the Bloomberg Foundation, and the Doris Duke Foundation. In partnership with the Penn Medicine Center for Health Care Innovation we have significantly expanded the use of the Way to Health platform in support of connected health initiatives within Penn Medicine.

A major success in the translation of our work this year was the deployment of payment transformation for primary care providers throughout the state of Hawaii, incentivizing value and quality over volume of services. This application of behavioral economics has given primary care clinicians throughout Hawaii the flexibility to care for their patients without the constraints of traditional fee-for-service billing.

I am pleased to report the addition of several talented new investigators to our affiliated faculty this year including welcoming new CHIBE Associate Director Harsha Thirumurthy to Penn. We now benefit from the expertise of seventy faculty members from across the University of Pennsylvania and from other top-tier universities across the United States. I look forward to further exciting new initiatives as CHIBE conducts research at the forefront of behavioral economics and health in the year ahead.

Sincerely,

Dr. Kevin Volpp

Janet and John Haas President's Distinguished Professor, Perelman School of Medicine and the Wharton School

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



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About our Center

Drawing on the expertise of faculty from across the University of Pennsylvania, the Center for Health Incentives and Behavioral Economics (CHIBE) conducts behavioral economics research aimed at reducing the disease burden from major U.S. public health problems. Originally founded within the University's Leonard Davis Institute of Health Economics, our mission is to inform health policy, improve healthcare delivery and increase healthy behavior.

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

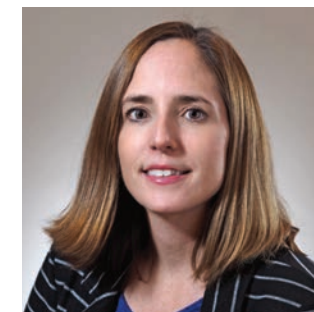
- To advance the science, knowledge, and application of behavioral economic interventions
- To train the next generation of leaders in the field
- To engage private and public sector partners to develop and test scalable and cost-effective applications

The Center, housed within the Department of Medical Ethics & Health Policy at the Perelman School of Medicine, has successfully conducted many randomized trials testing principles of behavioral economics in a wide variety of clinical, employer, and health plan contexts involving millions of patients nationally.

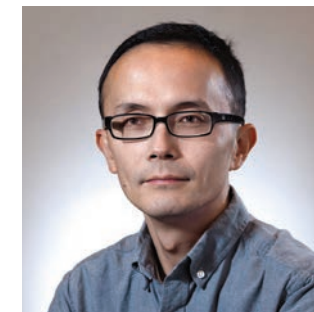
Center Leadership



George Loewenstein, PhD
Director, Roybal Pilot Program



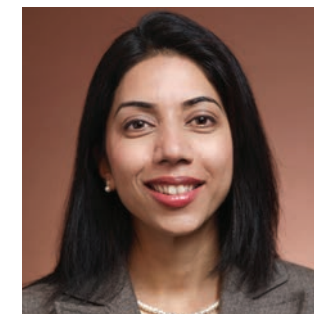
Joelle Friedman, MPA
Managing Director



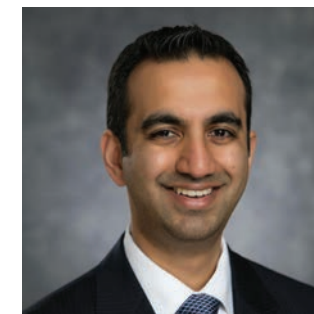
Jingsan Zhu, MS, MBA
Assistant Director, Data Analytics



Alison Buttenheim, PhD, MBA
Associate Director



Jalpa Doshi
Associate Director



Amol Navathe, MD, PhD
Associate Director



Harsha Thirumurthy
Associate Director



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



Elizabeth Cooney, MPH
Assistant Director, FIELDS Program



Kevin Volpp, MD, PhD
Director

External Advisory Board



Mitchell Blutt, MD, MBA
Consonance Capital



Troyen Brennan, MD, JD, PhD
CVS Health



Karen DeSalvo, MD, MPH
US Department of Health and Human Services
(formerly)



Robert Galvin, MD, MBA
The Blackstone Group



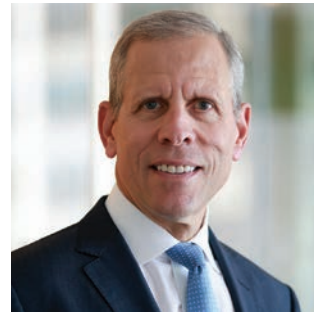
Mark Kelley, MD
Harvard University



David P. Kirchhoff, MBA
Snapkitchen



Vivian S. Lee, MD, PhD, MBA
University of Utah



Paul Mango, MBA
Candidate for Governor of Pennsylvania



Ralph Muller, MA
University of Pennsylvania Health System



Steven Schroeder, MD
University of California San Francisco



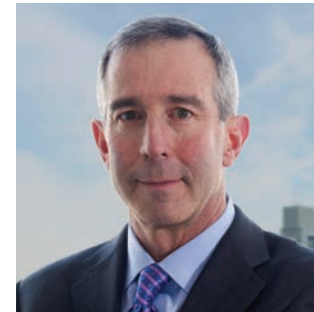
Deneen Vojta, MD
United Health Group



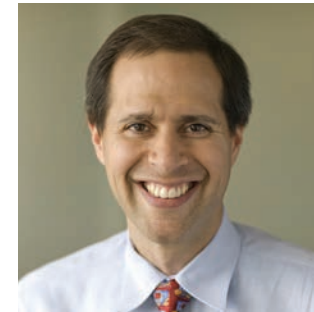
Sally Welborn, BA, CEBS
Wal-mart Stores, Inc. (formerly)



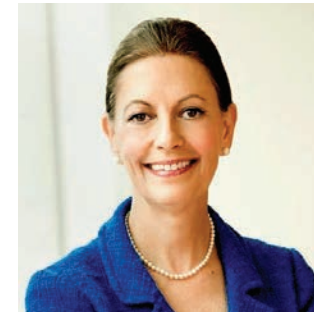
Gail Wilensky, PhD
Project HOPE



Michael Parmacek, MD
Perelman School of Medicine



Daniel Polsky, PhD, MPP
Leonard Davis Institute of Health Economics



Lynn Schuchter, MD
Perelman School of Medicine



Sankey Williams, MD
Perelman School of Medicine

Internal Advisory Board



David A. Asch, MD, MBA
Penn Medicine Center for Health Care Innovation



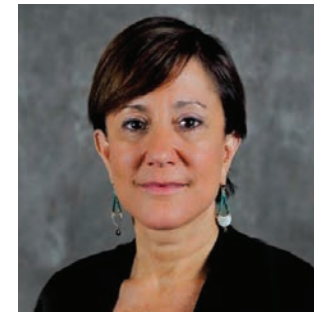
Barbara Kahn, PhD, MBA
Wharton School



Kevin Mahoney, MBA
University of Pennsylvania Health System



Mark Pauly, PhD
Wharton School



Caryn Lerman, PhD
Perelman School of Medicine

Faculty

Affiliations

70

**TOTAL # OF
AFFILIATED
FACULTY**

13

FACULTY MEMBERS

**Wharton
School of Business**

School of Nursing

PennLaw

**School of
Design**

Annenberg
School of
Communication

Graduate
School
of Education

School of Arts
& Sciences

13

FACULTY MEMBERS

Perelman
School of
Medicine

31

FACULTY MEMBERS

13

FACULTY MEMBERS

Other Universities

Carnegie Mellon University
Drexel University
Duke University

Harvard University
Rutgers University
University of California - Berkeley

University of Pittsburgh
University of Toronto
Yale University

Research Interests



Behavioral Economics and Health Annual Symposium

In partnership with the Robert Wood Johnson Foundation, CHIBE held its sixth annual Behavioral Economics and Health Symposium this year. Over 90 leading academics came to the Penn campus to discuss cutting-edge research in health-applied behavioral economics and goals for advancing the field forward.

L-R: Researchers from across the country gather at the University of Pennsylvania for CHIBE's academic symposium; The FIELDs team consists of more than 35 faculty, trainees and staff.



The FIELDs Program

Directed by Dr. Scott Halpern, the 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, FIELDs was established in 2012 with funding from the Otto Haas Charitable Trust. FIELDs trainees have received numerous F-, T-, and K-series career development awards from the NIH, have earned a dozen prestigious awards for their research, and have given many podium presentations

at the annual research meetings of leading professional societies. With roughly \$11 million in grant funding, FIELDs investigators are currently conducting more than 25 projects with a team of 35 faculty, trainees and staff. In FY 2017, several FIELDs junior investigators received career development awards, and the program received grant support for several large, multi-year studies. Likewise, the FIELDs program project portfolio, list of publications, and full-time staff have all expanded over the past year.

Penn Roybal Center

In 2009, CHIBE's Director, Dr. Kevin Volpp, collaborated with Dr. George Loewenstein at Carnegie Mellon University and successfully competed for NIH funding to establish the Penn Roybal Center on Behavioral Economics and Health. This is supported by a P30 center grant from the National Institute on Aging to conduct translational research in older populations. One of 13 Roybal Centers in the United States, 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.

The Penn Roybal Center distributes up to \$100,000 in pilot funding for projects testing interventions aimed at middle-aged and elderly Americans at high risk for premature morbidity and mortality. In FY 2017, we funded four pilot projects on topics including how to communicate the health risks of sugar-sweetened beverages, approaches to physician decision-making, and interventions to encourage uptake of colorectal screening.

Each year, our center holds a Roybal Retreat, attracting approximately seventy faculty, trainees, and staff from our team at the Perelman School of Medicine, the Penn Medicine Center for Health Care Innovation, and the Wharton School, as well as collaborators from Carnegie Mellon University. This year, the retreat drew affiliated scientists from Harvard, Johns Hopkins, Duke, New York University, Fordham, Rutgers and Case Western University.



Attendees at this year's Roybal Retreat work together to complete a scavenger hunt.



Clinical Translation and Science Award Program

CHIBE's pilot program supported by the Institute for Translational Medicine and Therapeutics (ITMAT) became an official part of the UPENN Clinical Translation and Science Award Community and Collaboration Core in FY 2017. As part of this program, CHIBE solicited proposals for pilot projects addressing 1) Improvement of enrollment in clinical trials and 2) Improvement of health outcomes or health behavior through the use of connected health interventions. CHIBE awarded six projects totaling \$238,000 in funding across both pilot programs. We were able to provide Way to Health 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.

Way to Health

Way to Health is an integrated, cloud-based platform that automates many of the research functions necessary for conducting randomized controlled trials of healthy behavior interventions and strategic telehealth programs. Operated as a partnership between CHIBE and the Penn Medicine Center for Health Care Innovation, the platform is an efficient, scalable, and low cost way to test behavioral interventions and can be deployed anywhere in the United States. To date, the platform has supported interventions that focus on medication adherence; weight loss; monitoring of blood sugar, blood pressure and weight; physical activity; safe driving; smoking cessation; sleep and patient compliance.

During FY 2017, the Way to Health team supported 49 projects including 38 research projects and 11 clinical pilots. Those projects are projected to engage with over 15,000 participants within the University of Pennsylvania Health System and across the United States. New clinical domains for this year include urology, oral health, mental health and addiction. With support from the Otto Haas Charitable Trust, the Way to Health team is working on significant revisions to become more like a self-service platform with modular features.



Penn Medicine Nudge Unit

Launched with support from CHIBE and the Penn Medicine Center for Health Care Innovation in 2016, the Penn Medicine Nudge Unit is the world's first health system based Nudge Unit. The group leverages insights from behavioral economics to design, test and scale interventions that steer clinicians and patients toward better decisions to improve health care delivery and outcomes. Within one year after launch, the Penn Medicine Nudge Unit has more than twenty active studies, including randomized trials testing price transparency for inpatient lab test ordering, active choice and peer comparisons for statin prescribing, defaults to reduce unnecessary imaging, and social incentives to increase patient mobility and reduce harms of hospitalization. The Penn Medicine Nudge Unit's work has been published in leading journals including JAMA Internal Medicine and has been featured in the New York Times and Forbes.



L-R, from top: Dr. Karen Glanz used Way to Health to conduct a study on financial and social incentives to increase walking in older adults; Dr. Heather Schofield joins ideas42 to discuss her work at the intersection of development, health and behavioral economics; The Nudge Unit meets to discuss new projects.



Behavioral Evidence Hub

The Behavioral Evidence Hub (B-Hub) is an online platform built by CHIBE with 2 other leading behavioral science groups, ideas42 and Innovations for Poverty Action, to put policy-relevant behavioral insights within easy reach of practitioners and problem-solvers. As a website, BHub.org, includes evidence-based initiatives that offer deep insight into tough problems impacting individuals in the U.S. and globally – from staying in college and increasing savings rates to improving medication adherence and vaccination uptake. The goal of the new site is to bridge the gap between promising academic research and large-scale deployment of behaviorally-informed solutions in products, systems and programs. Ongoing content development is supported by a growing network of contributors including the Behavioral Insights Group at the Harvard Kennedy School, the OECD, and the U.K.'s Financial Conduct Authority. The site is made possible in part by support from the Robert Wood Johnson Foundation.

Influential Research & Commentaries

Asch DA, Rosin R. **Engineering Social Incentives for Health.** *N Engl J Med.* 2016;375(26):2511-3.

Doshi JA, Lim R, Li P, Young PP, Lawnicki VF, State JJ, Troxel AB and Volpp KG. **A Synchronized Prescription Refill Program Improved Medication Adherence.** *Health Aff (Millwood).* 2016;35(8):1504-12.

John LK, Troxel AB, Yancy W, Friedman J, Zhu J, Yang L, Galvin R, Miller-Kovach K, Halpern SD, Loewenstein G, Volpp KG. **The Effect of Cost Sharing on an Employee Weight Loss Program: A Randomized Trial.** *Am J Health Promot.* 2016.

Larkin I, Ang D, Steinhart J, Chao M, Patterson M, Sah S, Wu T, Schoenbaum M, Hutchins D, Brennan T, Loewenstein G. **Association Between Academic Medical Center Pharmaceutical Detailing Policies and Physician Prescribing.** *JAMA.* 2017;317(17):1785-1795.

Liao JM, Fleisher LA, Navathe AS. **Increasing the Value of Social Comparisons of Physician Performance Using Norms.** *JAMA.* 2016;316(11):1151-1152.

Navathe AS, Emanuel EJ. **Physician Peer Comparisons as a Nonfinancial Strategy to Improve the Value of Care.** *JAMA.* 2016;316(17):1759-1760.

Navathe AS, Troxel AB, Liao JM, Nan N, Zhu J, Zhong W, Emanuel EJ. **Cost of Joint Replacement Using Bundled Payment Models.** *JAMA Intern Med.* 2017;177(2):214-222.

Rolnick JA, Asch DA, Halpern SD. **Delegalizing Advance Directives - Facilitating Advance Care Planning.** *N Engl J Med.* 2017;376(22):2105-2107.

Rubin EB, Buehler AE, Halpern SD. **States Worse Than Death Among Hospitalized Patients With Serious Illnesses.** *JAMA Intern Med.* 2016;176(10):1557-1559.

Sedrak MS, Myers JS, Small DS, Nachamkin I, Ziemba JB, Murray D, Kurtzman GW, Zhu J, Wang W, Mincarelli D, Danoski D, Wells BP, Berns JS, Brennan PJ, Hanson CW, Dine CJ, Patel MS. **Effect of a Price Transparency Intervention in the Electronic Health Record on Clinician Ordering of Inpatient Laboratory Tests: The PRICE Randomized Clinical Trial.** *JAMA Intern Med.* 2017.

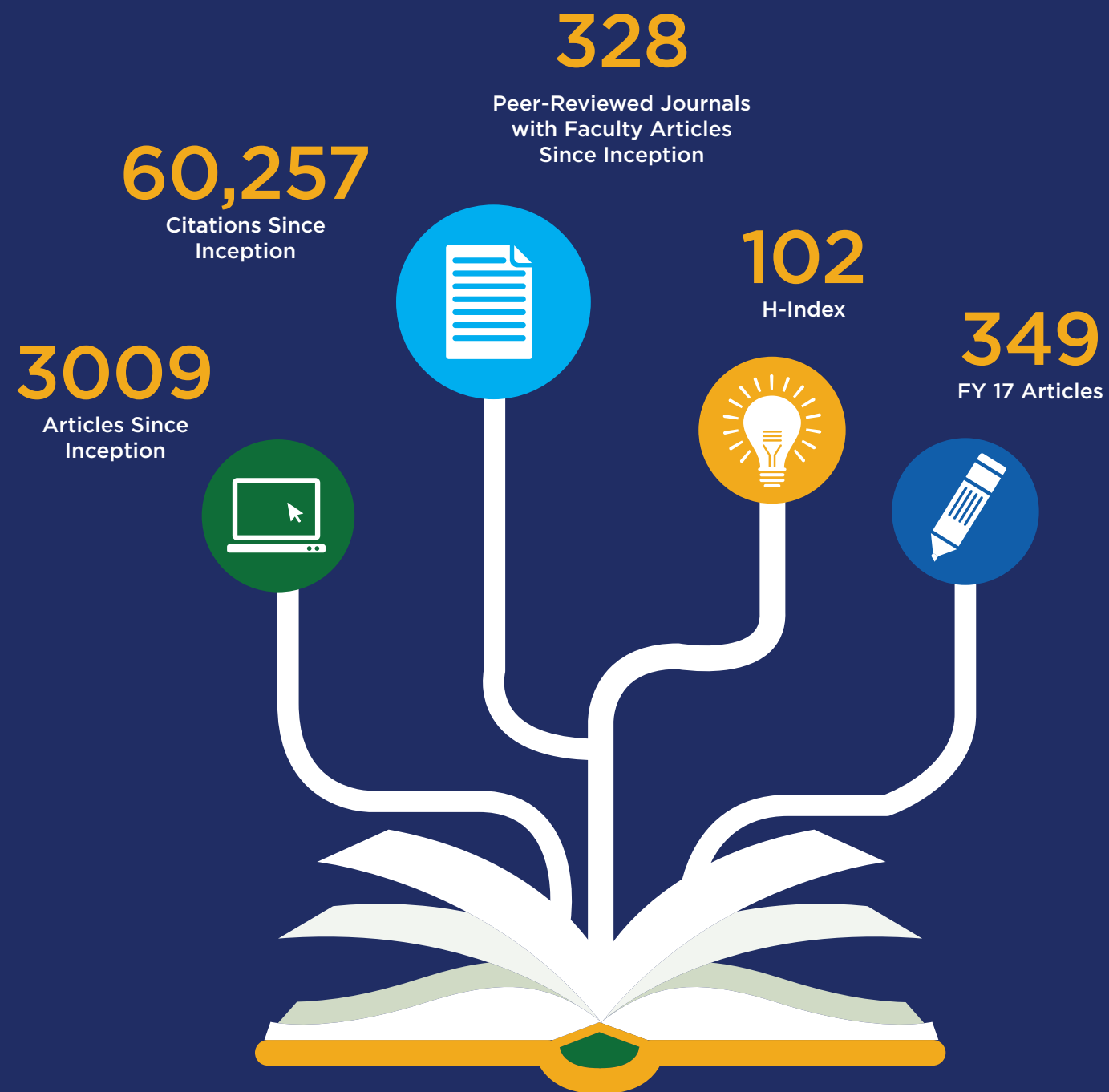
Skinner JS, Volpp KG. **Replacing the Affordable Care Act: Lessons From Behavioral Economics.** *JAMA.* 2017;317(19):1951-1952.

Vanepps EM, Roberto CA. **The Influence of Sugar-Sweetened Beverage Warnings: A Randomized Trial of Adolescents' Choices and Beliefs.** *Am J Prev Med.* 2016;51(5):664-672.

Volpp KG, Troxel AB, Mehta SJ, Norton L, Zhu J, Lim R, Wang W, Marcus N, Terwiesch C, Caldarella K, Levin T, Relish M, Negin N, Smith-McLallen A, Snyder R, Spettell CM, Drachman B, Kolansky D, Asch DA. **Effect of Electronic Reminders, Financial Incentives, and Social Support on Outcomes After Myocardial Infarction: The HeartStrong Randomized Clinical Trial.** *JAMA Intern Med.* 2017;177(8):1093-1101.

For a full list of publications, visit chibe.upenn.edu/publications

Publications by Numbers



Publication statistics since inception reflect total 2008-17 numbers for current CHIBE faculty affiliates.

Impactful Media Coverage

“Ordering in Advance Leads to Better Food Choices”
– New York Magazine
July 25, 2016

“States Worse Than Death as Perceived by the Seriously Ill”
– The Economist
August 1, 2016

“Patients More Likely to Take Medications When Refills Synced”
– Kaiser Health News
August 8, 2016

“Warning Labels May Discourage Teens from Purchasing Sugary Drinks”
– Forbes
September 8, 2016

“Here’s Why You Should Pay Your Children to Eat Their Vegetables”
– The Wall Street Journal
October 16, 2016

“Paying People to Walk More May Work until the Money Runs Out”
– Reuters
January 18, 2017

“The Perplexing Psychology of Saving For Health Care”
– NPR
February 15, 2017

“How Behavioral Economics Can Produce Better Health Care”
– The New York Times
April 13, 2017

“Doctors Prescribe Cheaper Drugs When Hospitals Limit Pharma-Rep Visits”
– VICE
May 4, 2017

“How Behavioral Economics Could Solve America’s Health Care Woes”
– Knowledge@Wharton
May 12, 2017

“Want to Employ Behavioral Economics for Good? Here’s a Helpful Collection of Ideas.”
– Fast Company
June 9, 2017

“There’s No Magical Savings in Showing Prices to Doctors”
– The New York Times
June 12, 2017

FY 17 Communications by Numbers

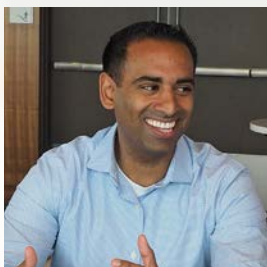
30% increase in newsletter subscribers

33,706 website pageviews

393% increase in twitter followers

For additional CHIBE news, visit chibe.upenn.edu/news

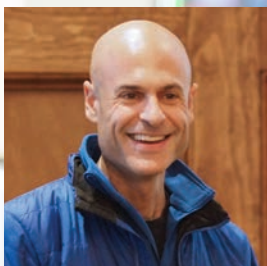
FY 17 Select Awards & Recognition



Philadelphia Business Journal 2016 Health Care Innovator Award
American Journal of Health Promotion Paper of the Year 2016, Editor's Choice Award

Mitesh Patel, MD, MBA, MS

Co-authors: Volpp KG, Rosin R, Bellamy SL, Small DS, Fletcher MA, Osman-Koss R, Brady JL, Haff N, Lee SM, Wesby L, Hoffer K, Shuttleworth D, Taylor DH, Hilbert V, Zhu J, Yang L, Wang X, Asch DA.



Association for Clinical and Translational Science Distinguished Investigator: Translation from Clinical Use into Public Benefit and Policy Award

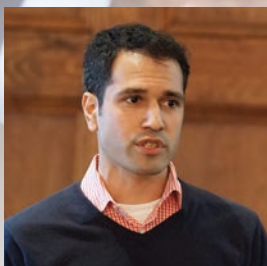
American Federation for Medical Research Outstanding Investigator Award

Scott Halpern, MD, PhD, MBE



Janet and John Haas President's Distinguished Professorship

Kevin Volpp, MD, PhD



Philadelphia Business Journal 2017 40 Under 40

Shivan Mehta, MD, MBA



National Heart Lung, and Blood Institute K23 Career Development Award

Joanna Hart, MD, MS

New Projects

This year, CHIBE was awarded several private sector grants, two grants from the National Institutes of Health and a large grant from the Bloomberg foundation. Through these contributions, our researchers have embarked on several new projects.



Drs. Angela Duckworth and Katherine Milkman collaboratively lead the Behavior Change for Good initiative.

Transforming Specialty Payment and Increasing Consumer Engagement for Hawaii Medical Services Association (Funder: HMSA)

CHIBE researchers are working to identify key social and behavioral determinants of health of individuals and communities in Hawaii in order to address gaps and determine areas for public health interventions. Building on this knowledge, our investigators are working with HMSA to address both clinical and social needs through health insurance benefit plan design, provider payment, and targeted community-based activities. The project includes developing and piloting specialty payment models by planning, testing, and implementing measures of quality, access, and cost.

Behavior Change for Good Initiative (BCFG)

(Funder: University of Pennsylvania & Chan Zuckerberg Initiative)

The Behavior Change for Good Initiative (BCFG) unites leaders in the social sciences, medicine, computer science, and neuroscience at the University of Pennsylvania to solve the problem of enduring behavior change. BCFG connects this world-class scientific team with partner organizations to run large-scale field experiments focused on improving daily decisions in education, health, and financial savings.

Improving Glycemic Control among Type II Diabetics (Funder: Doris Duke Foundation)

Social incentives are a patient-centered approach to leverage and enhance existing connections and influences on an individual, and also have the potential to be a scalable intervention that impacts population health. In this study, we use a randomized, controlled trial to test the effectiveness of different forms of social incentives delivered through gamification - game design used in a non-game setting - among obese, type II diabetics to improve glycemic control and to promote physical activity and weight loss.

New Projects



Dr. Christina Roberto leads a PEACH Lab team meeting.

Evaluation of the Philadelphia Beverage Tax (Funder: Bloomberg Foundation)

On January 1, 2017 Philadelphia became only the second U.S. city to pass a beverage tax on sugary and diet drinks. There is considerable interest in sugary drink taxes as a cost-effective way to lower consumption of sugary beverages and improve dietary habits, but few studies have examined how they influence consumers. CHIBE researchers at the Psychology of Eating and Consumer Health Lab (PEACH Lab) are studying the effect the tax has on beverage prices, purchases, and consumption as well as food retail businesses in Philadelphia.

Evaluating Connected Health Approaches to Improve the Health of Veterans (Funder: Veteran's Administration Career Development Award)

CHIBE investigators are conducting a randomized, controlled trial to test behavioral economic approaches to increase physical activity among overweight and obese veterans using either social incentives delivered through gamification, financial incentives or both approaches.

National University of Singapore Pilot Studies

CHIBE expanded its international footprint in FY 2017 by forging a partnership with the National University of Singapore (NUS), ranked the top university in Asia by the United Kingdom's QS World University Rankings. The CHIBE-NUS partnership aims to launch a number of joint behavioral economics pilot studies. Main focus areas will include better management of diabetes, medication adherence, the promotion of healthier lifestyles, and the use of wearable monitoring devices for chronic disease management.

Prevention of Urinary Stones with Hydration (Funder: NIH 1U01DK110961)

The objective of this study is to determine whether a multi-component program of behavioral interventions incorporating patient choice and remote monitoring of fluid intake through a smart water bottle will result in reduced risk of kidney stone disease recurrence and/or progression over a two year period.

UPENN Clinical Translation and Science Award Community and Collaboration Core (Funder: NIH 1UL1TR001878)

The goal of the community and collaboration core of the UPENN CTSA is to enhance engagement of a series of communities – patients, investigators, administrators and the public at large – through outreach efforts, enhanced utilization of mobile technologies and social media. We will explore the utilization of incentives and assess the effectiveness of such interventions with randomized trials. We will also advance translational research and health equity research through regional and national collaborations to facilitate testing, implementation and dissemination of effective prevention and treatment modalities and community-engaged research methods.

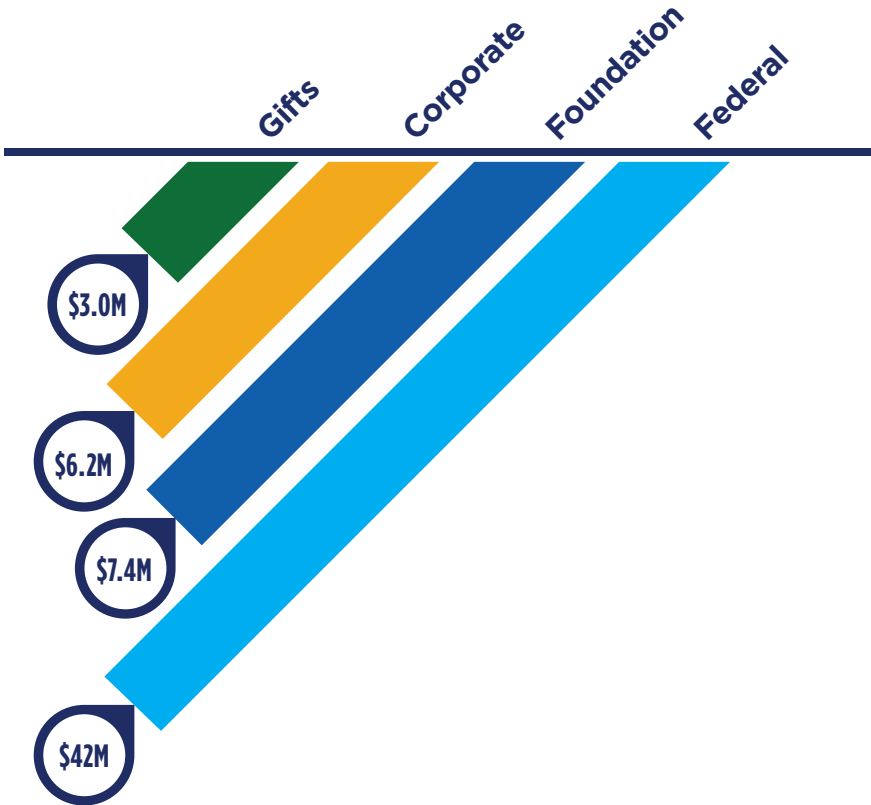
Funding Portfolio

CHIBE currently receives almost \$60M in 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 Perelman School of Medicine, Department of Medical Ethics & Health Policy and the Department of Medicine as well as the University of Pennsylvania Health System. This support has enabled us to make strategic investments and strengthen our infrastructure. We were also fortunate to receive two gifts from the Otto Haas Charitable Trust. This Foundation gift enables 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.

CHIBE was the recipient of generous support from the following sponsors this year: Hawaii Medical Services Association, Oscar, The Vitality Group, Bloomberg Foundation, Commonwealth Fund, Doris Duke Foundation, Greenwall Foundation, Otto Haas Charitable Trust, Moore Foundation, Robert Wood Johnson Foundation, Donaghue Foundation, Centers for Disease Control, National Institute on Aging, National Heart, Lung and Blood Institute, Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institute of Dental and Craniofacial Research, National Cancer Institute, National Center for Advancing Translational Sciences, and the Commonwealth of Pennsylvania.

Our current distribution of funding



Partners and Collaborators

New and Ongoing Partnerships

In FY 2017, we continued to diversify our research portfolio and were successful in getting support to design and test new ideas in partnership with private and public sector entities. We anticipate continued significant opportunities to develop and test scalable and cost-effective applications of behavioral economics in health care.

aetna

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ASCENSION

Biogen

oscar

Sutter Health
We Plus You

Humana

SEPTA

CVS Health

Independence

weightwatchers

Cigna

CAREMORE
It's what we do.™

NEW YORK STATE

NOVARTIS

PARTNERSHIP
HEALTHPLAN
of CALIFORNIA

Your Health
Choices for a Healthy Life

REGENERON

OrthoCarolina
EXCELLENCE
IN ORTHOPEDICS

Pfizer

SANOFI

Vitality

Horizon

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 both existing and new initiatives, our dedicated faculty and staff, and the many strong partnerships we have with collaborating organizations who share our goals of improving health and health care. We will continue to revamp our Way to Health platform to move towards a more modular self-service design and accelerate efforts to support pilot tests of clinical deployment among Penn Medicine patients in settings in which the health system bears financial risk.

We thank all of you 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 further improve the health of populations and to make the resources being spent on health and health services as impactful as possible.





Center *for* Health Incentives
& Behavioral Economics

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