

■ 2023 *ANNUAL REPORT*

HARVARD
PILGRIM
HEALTH CARE
INSTITUTE



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MISSION

The Institute's mission is to improve health care delivery and population health through research and education, in partnership with health plans, delivery systems, and public health agencies.

WHO WE ARE

The Department of Population Medicine (DPM) in the Harvard Pilgrim Health Care Institute is a research and teaching collaboration between Harvard Pilgrim Health Care and Harvard Medical School. The Department is housed in the Harvard Pilgrim Health Care Institute, a limited liability corporation of Harvard Pilgrim Health Care. We are one of 15 Harvard Medical School affiliates. In 2021, Harvard Pilgrim Health Care combined with Tufts Health Plan, creating Point32Health. The Institute is also part of Point32Health and now partners with both health plans.

As the nation's first medical school appointing department based in a health plan, we're strategically positioned to improve population health and health care delivery locally, nationally, and internationally. We're distinctive for our scope, expertise, and collaborations.

Our mission and activities are highly consonant with the National Academy of Medicine's advocacy for a national Learning Health System — one that incorporates evidence-based practices into routine care, captures new knowledge as part of the ongoing delivery of care, and then applies new knowledge in a timely manner.

We are **41** core faculty, **19** research scientists, **27** fellows, and more than **200** staff working with hundreds of institutional and individual collaborators around the globe.

LETTER FROM THE CHAIR



DEAR COLLEAGUES,

I could not be more delighted and honored to have taken on the role of Chair of the Department of Population Medicine and Institute President in January. Next year, I'll have the chance to celebrate all we accomplished in 2024. For now, I'd like to take this opportunity to reflect on what brought us to this point.

Over 2 decades ago, Rich Platt became the second Chair of the Department of Ambulatory Care and Prevention (now Department of Population Medicine) at Harvard Pilgrim Health Care (now part of Point32Health) and Harvard Medical School (no change yet!). After the fallout of the 2008 financial crisis, the Harvard Pilgrim Health Care Institute was founded to be the new institutional home for the Department, with Rich as its inaugural President.

I've heard it said that an organization can't be considered a true institution unless it outlasts the tenure of its founder. By this and many other measures, the Institute did, and continues to do, pretty great. So much has changed during Rich's tenure as Chair and President. Our department has a new name and different institutional reporting structure. Our faculty increased from 19 to more than 40. We went from no research scientists to almost two dozen. The overall count of employees more than doubled. Our extramural funding increased from \$10 million in 2000 to \$89 million last year!!

The many successes of 2023 build on the solid foundation of growth, impact, and collaboration that we have enjoyed under Rich's leadership. We continued to expand our portfolio of research projects on the health of populations ([see page 12](#)), many of which have had concrete influence on local, national, and international policies and programs ([page 16](#)). Our teaching and mentoring programs are anchored and elevated by faculty and the staff that support them ([page 20](#)).

I kick off this new role ready to take on new opportunities and growth. I know I won't be alone in these efforts. As we reflect on another year of collaboration, the evidence is strong: we're poised to achieve great things as long as we continue working together.

Warmly,

Emily Oken, MD, MPH

Professor and Chair, Department of Population Medicine
President, Harvard Pilgrim Health Care Institute

41 CORE FACULTY

60 PROJECT/ PROGRAM STAFF

42 ADMINISTRATIVE STAFF

104 RESEARCH STAFF

19 RESEARCH SCIENTISTS

27 FELLOWS

09 AFFILIATED FACULTY

31 AFFILIATED CLINICAL FACULTY

42 NEW HIRES IN 2023

15 STATES FROM WHICH WE TELECOMMUTE



RESEARCH

We conduct research on individuals' behaviors and environments as well as the structures, processes, and outcomes of the health care and public health systems. Our work blends a population and public health focus, is anchored in health care delivery, and leverages unprecedented data resources derived from health care delivery systems along with methodologic expertise in analyzing those resources.



MAJOR INSTITUTE PROGRAMS

MDPHNET: INFECTIOUS AND CHRONIC DISEASE MONITORING

Institute researchers have partnered with the Massachusetts Department of Public Health (MDPH) for almost two decades to operate and enhance a distributed data network that uses electronic health record data to support real-time detection and reporting of notifiable infectious diseases including hepatitis, HIV, and tuberculosis; weekly assessment of respiratory virus like illness; and monitoring for chronic conditions such as obesity, hypertension, smoking, and [diabetes](#)¹. The network currently covers approximately 50% of the Massachusetts population at 16 partner sites, with 4 new sites currently being onboarded.

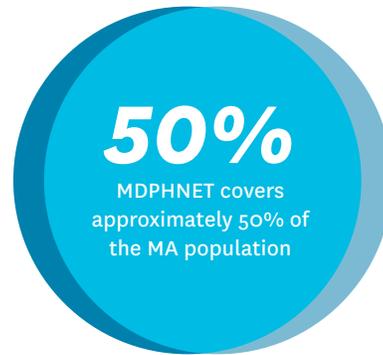
YEAR FOUNDED: 2007

PRINCIPAL INVESTIGATORS: **Michael Klompas** and **Noelle Cocoros**

2023 HIGHLIGHTS INCLUDE:

- Development of statistical models to improve estimates at both the state and local levels. These models adjust for differences between the people included in MDPHnet vs. the rest of the state. These ongoing, prospective estimates of conditions such as asthma and hypertension are being used as a complement to existing public health data sources.
- Introduction of a web-based population management tool to support partner practices to promote the uptake of preexposure prophylaxis (PrEP) for people at high risk of HIV. This work utilizes an HIV risk model developed at the Institute and provides sites with a list of their at-risk patients to target for PrEP outreach.

¹ <https://www.esphhealth.org>



- Creation of a novel surveillance tool for monitoring respiratory viral activity that integrates both laboratory tests and diagnosis codes. This tool helps both practices and public health agencies to monitor the full spectrum of respiratory viral illnesses and includes both tested and untested patients.

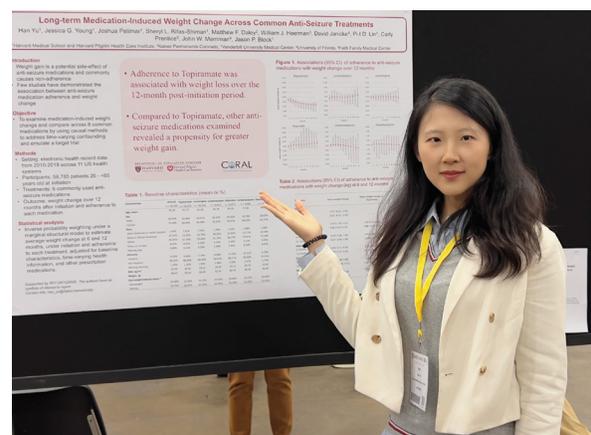
PCORNET

Institute researchers play a key role in [PCORnet](#)², the National Patient-Centered Clinical Research Network, an innovative research network that facilitates multi-site clinical and epidemiologic research using electronic health record data from health systems across the United States. The Institute was a Coordinating Center for PCORnet from its inception in 2014 through 2021. Institute researchers continue to lead work within PCORnet for research and population health surveillance.

YEAR FOUNDED: 2014

PRINCIPAL INVESTIGATOR: **Jason Block**

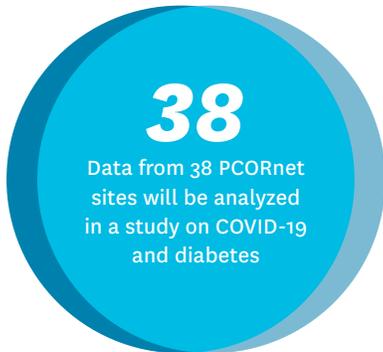
² <https://pcor.net/org/>



● Research fellow Han Yu presents a PCORnet study poster at The Obesity Society annual conference.

2023 HIGHLIGHTS INCLUDE:

- A recent [paper](#)³ found that among 1.5 million patients with COVID-19, higher blood pressure and glycated hemoglobin prior to infection were associated with more severe COVID-19 outcomes. Findings suggest that adults with the poorest control of hypertension or diabetes might benefit from efforts to prevent and initiate early treatment of COVID-19.
- Institute researchers are exploring the association of new prescriptions used for varied chronic diseases on weight change over time. Initial findings show that most patients starting antidepressants experience mild weight gain, with bupropion use associated with the least weight gain over a 2-year follow-up period.
- Vanderbilt University Medical Center was awarded an NIH grant to explore the relationship between COVID-19 and diabetes. **Jason Block** is one of the Principal Investigators of the study, and a team of Institute researchers will provide important contributions in analyzing data from 38 PCORnet sites to assess varied aspects of the relationship between COVID-19 and diabetes.



PROJECT VIVA

Led by Institute faculty, [Project Viva](#)⁴ is a landmark study of lifecourse influences on health and disease. Continuously funded by the NIH since 1998, Viva has followed a cohort of pregnant women and their (now young adult) offspring for more than two decades.

3 Jackson SL, Woodruff RC, Nagavedu K, Fearington J...Block JP; PCORnet Collaboration Authors*. Association Between Hypertension and Diabetes Control and COVID-19 Severity: National Patient-Centered Clinical Research Network, United States, March 2020 to February 2022. *J Am Heart Assoc.* 2023 Nov 7;12(21):e030240.

4 <https://www.projectviva.org>

COLLABORATING WITH HEALTH PLANS

As the nation's first medical school appointing department based in a health plan, we see it as our responsibility to understand the impact of ongoing and emerging issues on the health plan's members and on society. We greatly value the partnership between researchers at the Harvard Pilgrim Health Care Institute and Point32Health. Our work has helped to inform and evaluate new and innovative strategies for the health plan to implement to continue offering members high-value, evidence-based care. Past studies have focused on health insurance exchange plans, management of high-cost cancer medications, and coverage issues for genome-based technologies.

In 2023, 10 projects were active, including one project newly launched. Based on this work, our team published three papers:

[Research](#)⁵ led by former fellow Claire Abraham with co-mentor **Laura Garabedian** and Institute colleagues examined whether a state influenza vaccine mandate and elevated community COVID-19 severity affected a child's probability of receiving an influenza vaccine during the 2020-2021 influenza season, given the child's previous vaccination history. Results showed that vaccine mandates are an effective but not sufficient strategy to achieve optimal vaccine coverage rates.

Mei-Sing Ong and colleagues examined⁶ the association of inborn errors of immunity (IEI) disorders with the severity of COVID-19 infection and the development of long COVID. Results showed a significant risk for severe illness among IEI patients with COVID-19 infection.

[Work](#)⁷ led by former fellow Bryant Shuey with co-mentor **Hefei Wen** and Institute colleagues examined the effects of the Massachusetts 7-day opioid prescribing limit law on opioid prescriptions on post-operative orthopedic patients. Results show the law was associated with a 4% reduction in opioid prescriptions greater than 7 days, driven by lower prescriptions for less painful surgeries.

5 Abraham C, **Garabedian LF**, **LeCates RF**, Galbraith AA. Vaccine Mandates and Influenza Vaccination During the Pandemic. *Pediatrics.* 2023 Nov 1;152(5):e2023061545

6 Farmer JR, Galbraith A, **Ong MS**. Association of inborn errors of immunity with severe COVID-19 and post-acute sequelae of COVID-19. *J Allergy Clin Immunol Pract.* 2023 Aug;11(8):2616-2617.e2.

7 Shuey B, **Zhang F**, **Rosen E**, Goh B, Trad NK, Wharam JF, **Wen H**. Massachusetts' opioid limit law associated with a reduction in postoperative opioid duration among orthopedic patients, *Health Affairs Scholar*, Volume 1, Issue 6, December 2023, qxado68.

Project Viva has expanded its focus to include a wider range of experiences that influence health extending into midlife for the mothers, and young adulthood for their children. Health exposures of interest now include not only diet but also physical activity, sleep, environmental chemicals, air pollution, stressors, mental health, and others.

YEAR FOUNDED: 1998

PRINCIPAL INVESTIGATORS: **Emily Oken** and **Marie-France Hivert**

2023 HIGHLIGHTS INCLUDE:

- Project Viva turned **25!** The next era of research kicked off with conducting the Young Adult Visit, the 7th in-person visit with “Viva Kids” since birth. Read more about the history of Project Viva in the [birthday report](#)⁸.
- The team launched a new [web-based research portal](#)⁹ to support data sharing, called the Research Operations and Data Management Platform (Viva ROADMaP).
- A total of **53** publications using Project Viva data were published in 2023, the highest number in any year since the founding of the study.

53
Publications using Project Viva data were published in 2023

25 YEARS OF PROJECT VIVA!

⁸ <https://www.projectviva.org/copy-of-25-years-of-project-viva>

⁹ https://vivaroadmap.net/users/sign_up?invitation_code=welcome-to-viva-roadmap [vivaroadmap.net]

THE U.S. FOOD AND DRUG ADMINISTRATION (FDA) SENTINEL SYSTEM

68
Analyses were run in the Sentinel System by the FDA

The Harvard Pilgrim Health Care Institute led the development, maintenance, and expansion of the [FDA Sentinel System](#)¹⁰, a program that allows the FDA to work with the nation’s leading health care organizations and data partners to monitor the safety and effectiveness of marketed medical products. Sentinel created a distributed electronic health data network. Curated data covering tens of billions of hospital stays, outpatient visits, and pharmacy dispensings remains with the participating organizations to ensure the privacy and security of patients’ health information.

YEAR FOUNDED: 2009

PRINCIPAL INVESTIGATOR: **Darren Toh**

2023 HIGHLIGHTS INCLUDE:

- **11** publications were posted to the Sentinel website, with **13** actively under review by academic journals.
- The FDA ran **68** analyses in the Sentinel System.
- Analyses conducted within the Sentinel System informed the FDA’s approval of medications, reversal of medication approvals, adjustments to the communication of medication warnings, and reclassification of medications ([see page 17](#)).

¹⁰ <https://www.sentinelinitiative.org/>

FOLLOW US ON SOCIAL



TOP 5 MOST WIDELY SHARED PUBLICATIONS ON SOCIAL MEDIA & NEWS

- 11 Ehrenzeller S, **Klompas M**. Association Between Daily Toothbrushing and Hospital-Acquired Pneumonia: A Systematic Review and Meta-Analysis. *JAMA Intern Med*. 2024;184(2):131-142.
- 12 Choi SE, **Shen Y, Wright DR**. Cost-effectiveness of Dental Workforce Expansion Through the National Health Service Corps and Its Association With Oral Health Outcomes Among US Children. *JAMA Health Forum*. 2023;4(3):e230128.
- 13 **Pak TR, Rhee C, Wang R, Klompas M**. Discontinuation of Universal Admission Testing for SARS-CoV-2 and Hospital-Onset COVID-19 Infections in England and Scotland. *JAMA Intern Med*. 2023;183(8):877-880.
- 14 **Aris IM, Perng W...James P, Oken E**; Environmental Influences on Child Health Outcomes. Neighborhood Opportunity and Vulnerability and Incident Asthma Among Children. *JAMA Pediatr*. 2023 Oct 1;177(10):1055-1064.
- 15 **Klompas M, Baker MA, Rhee C**. Is Nosocomial SARS-CoV-2 Still Worth Preventing? *JAMA Netw Open*. 2023;6(11):e2344704.

2023 RESEARCH HIGHLIGHTS

DISPARITIES

We continue to expand our portfolio of cross-cutting research examining health inequities and disparities with the ultimate goal of eliminating them.

- **Peter James** and colleagues [evaluated](#)¹⁶ the distribution of natural environments across the U.S., including satellite-based vegetation, park data, and water access, which may protect against several adverse health outcomes. They found that multiple facets of the natural environment are inequitably distributed, which may partially explain health disparities observed across the country.
- Social determinants of health, though key to improving clinical health outcomes, are difficult to capture in traditional health care data workflows. A team

16 Klompmaaker JO, Hart JE...James P. Racial, Ethnic, and Socioeconomic Disparities in Multiple Measures of Blue and Green Spaces in the United States. *Environ Health Perspect.* 2023 Jan.



- Alon Peltz's work focuses on health and social policy, outcomes measurement, and human-centered design.

led by **Anjum Khurshid** successfully [piloted](#)¹⁷ a digital platform using real-world clinical data in health care settings. The pilot shows the importance of and promise in the proposed methods of sharing data across sectors and service providers for scalable patient-level care coordination and community-level insights.

- **Alon Peltz** and colleagues examined Medicaid emergency department (ED) reimbursement algorithms for evidence of potential racial and ethnic bias. [Results](#)¹⁸ showed that Black and Hispanic children visiting the ED were significantly more likely to have their visits classified as nonemergent and thus potentially subject to lower reimbursement. These results suggest that bias contained in data algorithms may introduce inequity in health care payments.

GENOMICS

Rapid advances in genomic technologies, screening, and the availability of increasing amounts of genomic information influence how health care is provided. Institute researchers identify and evaluate genomics practices to improve individual and population health.

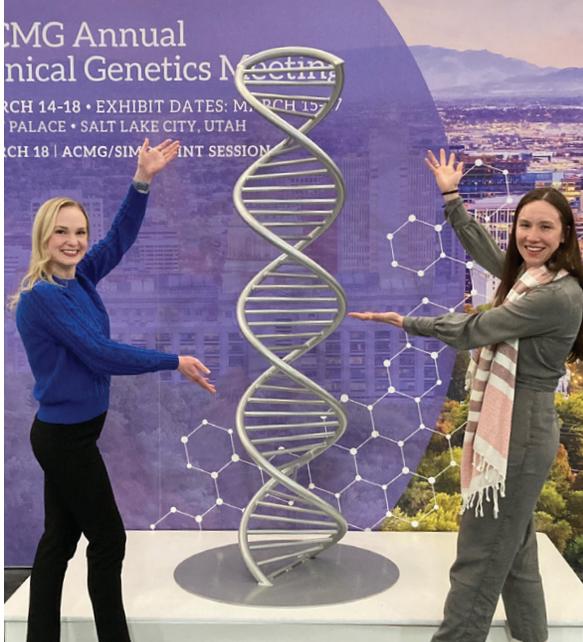
- **Kurt Christensen** and a team of Institute investigators and other colleagues [developed](#)¹⁹ a model to estimate the impact of newborn genetic screening for hypertrophic cardiomyopathy in a birth cohort of 3.7 million newborns. Results suggested that newborn genetic screening would reduce disease-related deaths during childhood by about 20%, but at a high cost and would require many healthy children to undergo monitoring.
- **Hadley Stevens Smith** and colleagues [assessed](#)²⁰ the parent-reported clinical utility of pediatric genomic

17 **Khurshid A, Hautala M, Oliveira E...**Sohail R. Social and Health Information Platform: Piloting a Standards-Based, Digital Platform Linking Social Determinants of Health Data into Clinical Workflows for Community-Wide Use. *Appl Clin Inform.* 2023 Oct;14(5):883-892.

18 Pomerantz A, De Souza HG...**Peltz A.** Racial and Ethnic Differences in Insurer Classification of Nonemergent Pediatric Emergency Department Visits. *JAMA Netw Open.* 2023 May 1.

19 **Christensen KD, McMahon PM, Galbraith LN...**Wu AC. Benefits, harms, and costs of newborn genetic screening for hypertrophic cardiomyopathy: Estimates from the PreEMPT model. *Genet Med.* 2023 Apr;25(4):100797.

20 **Smith HS, Ferket BS...**Russell HV. Parent-Reported Clinical Utility of Pediatric Genomic Sequencing. *Pediatrics.* 2023 Aug 1;152(2):e2022060318.



● Hadley Stevens Smith and former research fellow Monica Wojcik at the 2023 ACMG Annual Clinical Genetics Meeting.

sequencing. Results showed that in diverse pediatric clinical contexts, genomic sequencing results can lead to recommendations of follow-up care, but they likely do not prompt large increases in the quantity of care received.

HEALTH POLICY

Institute researchers seek to inform policies and system innovations that improve health outcomes, especially among vulnerable populations. We engage in research and capacity-building in both the United States and around the world.

- New [work](#)²¹ led by **Daniel Nelson** and **Hao Yu** examined the effects of a federal policy implemented during the COVID-19 pandemic requiring continuous enrollment in Medicaid. Results showed the continuous enrollment policy led to a significant reduction in the rates of becoming uninsured for adult Medicaid enrollees.
- **Joshua Petimar** and colleagues [investigated](#)²² changes in dental decay after the implementation of a tax on sweetened beverages in Philadelphia. Study results found that while the tax was not associated with reduced tooth decay in the general

21 **Nelson DB**, Goldman AL, **Zhang F**, Yu H. Continuous Medicaid coverage during the COVID-19 public health emergency reduced churning, but did not eliminate it. *Health Aff Sch.* 2023 Nov;1(5):qxado55.

22 **Petimar J**, Gibson LA...**Block JP**, Roberto CA. Changes in Dental Outcomes After Implementation of the Philadelphia Beverage Tax. *Am J Prev Med.* 2023 Aug.

population it was associated with reduced tooth decay in adults and children on Medicaid, suggesting potential health benefits for low-income populations.

- **Jason Block** and colleagues [reviewed](#)²³ current evidence surrounding several nutrition policies intended to improve diet quality and decrease rising obesity prevalence, including beverage taxes, calorie labeling, and nutritional changes to federal nutrition programs. They suggest that though some individual policies have been shown to affect dietary choices and possibly body weight, multiple policies acting in concert are more likely to be successful than single policies.
- **Mahnum Shahzad**, Anita Wagner, and colleague [examined](#)²⁴ the potential effects of reforming the FDA's accelerated approval pathway which expedites drug development by approving drugs on the basis of an effect on a surrogate endpoint as opposed to a clinical endpoint. Results indicate that requiring pre-approval initiation of trials that aim to confirm the expected clinical benefit may result in timelier regulatory action on drugs initially approved on the basis of limited evidence.

INFECTION CONTROL AND DETECTION

Institute investigators and clinicians remain invested in studying the impacts of COVID-19 as well as surveillance and control of many other infections.

- Former Institute fellow Claire Shappell, mentored by **Michael Klompas** and **Chanu Rhee**, [summarized](#)²⁵ recent insights into the epidemiology of sepsis and highlight several urgent questions and priorities catalyzed by COVID-19. They note the growing consensus that severe COVID-19 causing organ dysfunction is appropriate to label as sepsis, even though it is treated very differently from bacterial sepsis. They suggest that surveillance strategies be modified

23 Hua SV, Collis CE, **Block JP**. Developing Effective Strategies for Obesity Prevention. *Gastroenterol Clin North Am.* 2023 Jun;52(2):469-482.

24 **Shahzad M**, Naci H, **Wagner AK**. Association Between Preapproval Confirmatory Trial Initiation and Conversion to Traditional Approval or Withdrawal in the FDA Accelerated Approval Pathway. *JAMA.* 2023;329(9):760-761.

25 Shappell C, **Rhee C**, **Klompas M**. Update on Sepsis Epidemiology in the Era of COVID-19. *Semin Respir Crit Care Med.* 2023 Feb;44(1):173-184.



“Our portfolio of research continues to grow, constantly expanding to add new populations, data sources, and topics that arise in medicine and population health.”

JASON BLOCK, INSTITUTE DIRECTOR OF RESEARCH

to reliably identify these cases to fully capture and delineate the current burden of sepsis.

- New [work](#)²⁶ from Institute researchers, including former fellow Claire Shappell and senior author **Chanu Rhee**, developed and validated an electronic health record-based surveillance definition for COVID-19-associated sepsis and demonstrated that COVID-19 accounted for 1 in 6 cases of sepsis during the first 33 months of the pandemic, highlighting the importance of viral sepsis.

INNOVATING HEALTH CARE DELIVERY

Institute investigators apply rigorous research methods to robust data sources to evaluate clinical care processes to improve care delivery and, ultimately, outcomes.

- In a 137-hospital CDC-funded clinical [trial](#)²⁷, **Richard Platt** and colleagues addressed questions arising from their landmark REDUCE [study](#)²⁸. This previous

26 Shappell CN, Klompas M, Chan C, Chen T, Kanjilal S, McKenna C, Rhee C; CDC Prevention Epicenters Program. Use of Electronic Clinical Data to Track Incidence and Mortality for SARS-CoV-2-Associated Sepsis. *JAMA Netw Open*. 2023 Sep 5;6(9):e2335728.

27 Huang SS, Septimus EJ...**Platt R**. Nasal Iodophor Antiseptic vs Nasal Mupirocin Antibiotic in the Setting of Chlorhexidine Bathing to Prevent Infections in Adult ICUs: A Randomized Clinical Trial. *JAMA*. 2023 Oct 10;330(14):1337-1347.

28 Huang SS, Septimus E...**Platt R**; CDC Prevention Epicenters Program; AHRQ DECIDE Network and Healthcare-Associated Infections Program. Targeted versus universal decolonization to prevent ICU infection. *N Engl J Med*. 2013 Jun 13;368(24):2255-65. Erratum in: *N Engl J Med*. 2013 Aug 8;369(6):587. Erratum in: *N Engl J Med*. 2014 Feb 27;370(9):886.

study demonstrated that daily bathing of ICU patients with antimicrobial soap plus a nasal antibiotic ointment, mupirocin, markedly reduced infections. In response to concerns that mupirocin would increase antimicrobial resistance, investigators tested it against an iodine-based antibacterial and found: 1) the iodine group had more infections; 2) mupirocin resistance had not increased, and 3) iodine was better than nothing. This work is one of several studies performed in partnership with HCA Healthcare.

- In a randomized clinical [trial](#)²⁹ of children with mild sleep-disordered breathing, **Rui Wang** and colleagues examined whether early adenotonsillectomy compared with watchful waiting with supportive care would improve neurodevelopment, behavior, health, or sleep-related outcomes. At the 12-month follow-up, adenotonsillectomy did not significantly improve cognition or attention, however, those who had undergone the surgery had improved symptoms, behavior, and lower blood pressure.

MATERNAL HEALTH

The health of women during pregnancy, childbirth, and thereafter is a quickly growing research focus among Institute researchers, spanning research divisions and disciplines.

- [Research](#)³⁰ led by Institute fellow **Diana Soria Contreras** and other Institute researchers, including senior author **Emily Oken**, showed that women who had their first birth at a younger (<23 years) or older age (≥40 years) and those who had four or more lifetime births had a higher trajectory of weight, waist circumference, and body fat up to 20 years after their final birth. The findings show timing of first birth and parity might contribute independently to changes in weight and adiposity that persist years beyond the end of a woman's reproductive stage.

29 Redline S, Cook K...**Wang R**; Pediatric Adenotonsillectomy Trial for Snoring (PATS) Study Team. Adenotonsillectomy for Snoring and Mild Sleep Apnea in Children: A Randomized Clinical Trial. *JAMA*. 2023 Dec 5;330(21):2084-2095.

30 **Soria-Contreras DC, Aris IM, Rifas-Shiman SL, Perng W, Hivert MF, Chavarro JE, Oken E**. Associations of age at first birth and lifetime parity with weight and adiposity across midlife in women from Project Viva. *Obesity (Silver Spring)*. 2023 Sep;31(9):2407-2416.

→ A genome-wide transcriptomic [study](#)³¹ spearheaded by **Marie-France Hivert** revealed novel genes potentially implicated in placental biologic response to higher maternal BMI in early pregnancy. The team's findings may offer some insight into underlying mechanisms by which maternal BMI may influence the placental transcriptome and may offer novel targets for the development of future interventions to limit the adverse pregnancy or perinatal outcomes associated with maternal obesity.

RESEARCH METHODS

Institute researchers are highly skilled at fine-tuning novel research methods and innovating ways to apply these methods to public health issues.

- Sharing individual-level data can be challenging in multi-site studies due to feasibility and privacy concerns. **Dongdong Li, Rui Wang**, and a team of Institute investigators and colleagues [developed](#)³² a general distributed methodology for fitting Cox proportional hazards model that uses only summary-level statistics from each site, without requiring iterative file transfers.
- Estimating the causal treatment effect on outcomes that are only defined as conditional on a posttreatment event status can be challenging due to the potential effect of treatment on the posttreatment event. **Jessica Young** and colleagues [proposed](#)³³ the conditional separable effects to quantify causal effects of the study treatment in a subset of the population defined on post treatment events and provided general conditions under which these effects can be identified and estimated.

31 Sordillo JE, White F..., **Hivert MF**. Higher Maternal Body Mass Index is associated with Lower Placental Expression of EPYC: A Genome-Wide Transcriptomic Study. *J Clin Endocrinol Metab*. 2023 Oct 21:dgad619.

32 **Li D, Lu W, Shu D, Toh S, Wang R**. Distributed Cox proportional hazards regression using summary-level information. *Biostatistics* 2023, 24(3): 776-794.

33 Stensrud MJ, Robins JM, Sarvet A, Tchetgen Tchetgen EJ, **Young JG**. Conditional separable effects. *The Journal of American Statistical Association* 2023, 118 (544), 2671-2683.

THOUGHT PIECES

As authorities in their areas of research, faculty often pen think pieces on timely, relevant topics in health care and medicine in high-impact journals and media.

In a *JAMA Viewpoint*³⁴, **Michael Klompas, Chanu Rhee**, and colleagues recount that the Center for Medicare & Medicaid Services Severe Sepsis/Septic Shock Early Management Bundle (SEP-1), launched in 2015, has failed to improve sepsis outcomes for patients. They acknowledge SEP-1's role in highlighting the need for improved sepsis care, discuss evidence of its shortcomings, and advocate for a shift in sepsis quality measures from processes to outcomes.

In a *New England Journal of Medicine Perspective*³⁵ timed with the FDA's approval of the first over-the-counter (OTC) oral contraceptive pill, **Douglas Krakower** and **Julia Marcus** advocate for OTC access to preexposure prophylaxis (PrEP), an antiviral medication to prevent HIV infection, as a start to alleviating barriers to access, particularly for people who face stigma in health care settings.

In a *New England Journal of Medicine Perspective*³⁶, **Meghan Baker, Michael Klompas, Chanu Rhee**, and colleague discuss two conflicting issues: the unique vulnerability of hospitalized patients to respiratory viruses, including COVID-19; and widespread masking fatigue among health care workers. In response, they advocate for the use of strategic masking in health care settings to protect patients from all respiratory viruses by limiting masking requirements to clinical interactions alone during periods when viral activity in the community is elevated.

34 **Klompas M, Rhee C, Singer M**. The Importance of Shifting Sepsis Quality Measures From Processes to Outcomes. *JAMA*. 2023;329(7):535-536.

35 **Krakower D, Marcus JL**. Free the PrEP - Over-the-Counter Access to HIV Preexposure Prophylaxis. *N Engl J Med*. 2023 Aug 10;389(6):481-483.

36 **Klompas M, Baker MA, Rhee C, Baden LR**. Strategic Masking to Protect Patients from All Respiratory Viral Infections. *N Engl J Med*. 2023 Jul 6;389(1):4-6.

CREATING *IMPACT*

Much of our research generates actionable findings that lead to concrete changes in local, national, and international policies and programs.

Research³⁷ led by Julia Marcus examining the life expectancy of people with and without HIV contributed to legislation that protects people living with HIV in California from discrimination by life and disability insurance companies.

which went into effect on January 1, 2023, includes data from her research on life expectancy for people with HIV.

Vaccine safety monitoring research³⁸ through the CDC's Vaccine Safety Datalink, led by Judith Maro and Katherine Yih, used tree-based scan statistics to look for clusters of >60,000 possible adverse events after 1.3 million doses of bivalent COVID-19 vaccination. Study results provided reassurance of the safety of mRNA COVID-19 vaccines.

Unique advantages of this method are its broad, untargeted nature and its inherent adjustment for the many post-vaccination diagnoses and time windows evaluated.

Research³⁹ by Douglas Krakower, Julia Marcus, and research fellow Michael Traeger has shown that doxycycline as sexually transmitted infection prophylaxis (doxyPEP) can be strategically prescribed to maximize impact on sexually transmitted infections while minimizing harms linked to antibiotic overuse.

Their work is cited as evidence to support recommendations in the [National Guidelines for the Use of DoxyPEP](#) from the Centers for Disease Control and Prevention (CDC) and [doxyPEP clinical guidelines](#) from the New York State Department of Health's AIDS Institute Clinical Guidelines Program. This work also informed [national guidance for doxyPEP prescribing](#) from the Australasian Society for HIV, Viral Hepatitis and Sexual Health Medicine, a leading organization for STI guidelines in Australia and New Zealand.

The Institute plays a leadership role in the FDA Sentinel System, a program that allows the FDA to monitor the safety and effectiveness of marketed medical products (see page 10).

Sentinel analyses contributed to the FDA's approval of the oral antiviral Paxlovid in 2023. Paxlovid is the fourth drug — and first oral antiviral pill — approved for the treatment of COVID-19 in adults; specifically, it is recommended for mild-to-moderate cases for those at high risk for progression to severe COVID-19, including hospitalization or death.

Sentinel-led systematic reviews to critically evaluate and interpret the medical literature on the effectiveness and potential harms of marijuana were cited in the FDA's recommendation to the Drug Enforcement Administration (DEA) for a change in Schedule for marijuana as a controlled [substance](#)⁴⁰. The National Institute on Drug Abuse (NIDA)'s original ruling citing marijuana as a Schedule I controlled substance under 21 U.S.C. 811(c). NIDA loosened the classification of marijuana to a Schedule III controlled substance.

Many new therapies come to market via the FDA's accelerated approval pathway, which allows the approval of drugs for marketing that are reasonably likely to provide clinical benefit. One such drug, Makena, approved to reduce the risk of preterm birth in women pregnant with one baby who have a history of spontaneous preterm birth, had its approval [withdrawn](#)⁴¹ by the FDA in 2023, concluding that the benefits of the drug no longer outweigh the risks. Sentinel results were presented at a 2019 FDA Advisory Committee Meeting leading to this suggestion.

A Sentinel analysis of new female users of Lotronex, approved for the treatment of irritable bowel syndrome, from 2016 to 2020 found the rate of ischemic colitis consistent with that listed in the Prescribing Information. This [evidence](#)⁴² informed the FDA's removal of the risk evaluation and mitigation strategies (REMS) programs associated with the drug. While safety risks remain, the standard Postmarket Drug Safety Information for Patients and Providers was deemed sufficient for prescribing of the drug.

37 **Marcus JL**, Chao CR...Silverberg MJ. Narrowing the Gap in Life Expectancy Between HIV-Infected and HIV-Uninfected Individuals With Access to Care. *J Acquir Immune Defic Syndr*. 2016 Sep 1;73(1):39-46.

38 **Yih WK**, Daley MF...**Maro JC**. Safety signal identification for COVID-19 bivalent booster vaccination using tree-based scan statistics in the Vaccine Safety Datalink. *Vaccine*. 2023 Aug 14;41(36):5265-70.

39 **Traeger MW**, Mayer KH, **Krakower DS**, Gitin S, Jenness SM, **Marcus JL**. Potential impact of doxycycline post-exposure prophylaxis prescribing strategies on incidence of bacterial sexually transmitted infections. *Clin Infect Dis*. 2023 Aug 18:ciad488.

40 <https://www.sentinelinitiative.org/methods-data-tools/methods/medical-literature-and-data-cannabis-use>

41 <https://www.fda.gov/news-events/press-announcements/fda-commissioner-and-chief-scientist-announce-decision-withdraw-approval-makena>

42 <https://www.fda.gov/drugs/postmarket-drug-safety-information-patients-and-providers/lotronex-alosetron-hydrochloride-information>

TEACHING

Our mission includes leading educational programs that give physicians and population scientists-in-training the tools they need to become health care leaders of the future. We take education beyond the classroom and into the types of settings where these trainees will eventually practice. Our teaching programs are enriched by our focus on the health of populations and our understanding of the diverse health issues that face our society in the 21st century.



CLASSROOM TEACHING

HARVARD MEDICAL SCHOOL

CLINICAL EPIDEMIOLOGY AND POPULATION HEALTH | LED BY IZZUDDIN ARIS, JASON BLOCK, AND LAURA GARABEDIAN

Institute faculty have led this curriculum as our core course since 1996. This longitudinal curriculum spans three required courses in the pre-clerkship and post-clerkship phases of the HMS curriculum: Essentials of the Profession I, Transition to the Principal Clinical Experience, and Essentials of the Profession II. 13 faculty, 5 research scientists, and 4 research fellows participated in teaching the courses in 2023.

“Our goal is to equip students with the skills to critically evaluate evidence and use it appropriately in clinical decisions and population health management.”

LAURA GARABEDIAN, INSTITUTE DIRECTOR OF TEACHING, CLINICAL EPIDEMIOLOGY AND POPULATION HEALTH



● Pictured from left to right: Jason Block, Laura Garabedian, and Izzuddin Aris, co-leads of Clinical Epidemiology and Population Health.

ADVANCED INTEGRATED SCIENCE COURSE (AISC): NUTRITION, METABOLISM, AND LIFESTYLE MEDICINE | MARIE-FRANCE HIVERT (CO-LEAD)

CURRICULAR THEME: NUTRITION AND LIFESTYLE MEDICINE | MARIE-FRANCE HIVERT

MECHANISMS OF MICROBIAL PATHOGENESIS | SANJAT KANJILAL

COURSE LEADERSHIP AND TEACHING AT THE HARVARD T.H. CHAN SCHOOL OF PUBLIC HEALTH

Institute faculty also bring their analytical and statistical methods expertise to lead several courses at the Harvard T.H. Chan School of Public Health.

ANALYSIS OF MULTIVARIATE AND LONGITUDINAL DATA | TOM CHEN

BUILT ENVIRONMENT, NATURE, AND HEALTH | PETER JAMES

CORE PRINCIPLES OF DATA SCIENCE | DONGDONG LI

CONFOUNDING CONTROL: A COMPONENT OF CAUSAL INFERENCE | JESSICA YOUNG

GENDER AND HEALTH | BRITTANY CHARLTON

INTRODUCTION TO STATISTICAL GENETICS | SHARON LUTZ (CO-LEAD)

STATISTICAL INFERENCE I | RUI WANG

“As scientists, we all hope to make a difference in population health. In this course, students gain exposure to how science on the epidemiology of built and natural environments is translated into policy and action, and build the key skills needed to conduct their own.”

PETER JAMES, BUILT ENVIRONMENT, NATURE, AND HEALTH

ADDITIONAL TEACHING ACTIVITIES

HARVARD SEXUAL AND GENDER MINORITY HEALTH MENTORING PROGRAM | BRITTANY CHARLTON

HARVARD SOGIE REPRODUCTIVE HEALTH SEMINAR SERIES | BRITTANY CHARLTON



● Rui Wang leads an advanced statistics course geared toward doctoral students across Harvard University.

“Statistical Inference I equips Biostatistics doctoral students with the commonly-used tools for data reduction, hypothesis testing, estimation, and inference, and prepares them for their doctoral qualifying exams and dissertation research.”

RUI WANG, STATISTICAL INFERENCE I

“We have spent considerable time finding the right balance between conveying fundamental principles of microbial pathogenesis, and pragmatic skills, such as taking a proper infection history and diagnostic reasoning. We have also sought to integrate health equity into core content given its outsized importance in explaining patterns of disease and informing management.”

SANJAT KANJILAL, MECHANISMS OF MICROBIAL PATHOGENESIS

A CATALYST FOR A SUCCESSFUL RESEARCH CAREER

We are so proud of the accomplishments of our trainees. 2023 highlights include:

15 COMPLETED FELLOWSHIPS
Resulting in clinical, research, and faculty positions

23 FIRST-AUTHOR PAPERS
Led by fellows, mentored by Institute faculty

11 NEW FELLOWS
Joined in 2023

COLLABORATING IN THE COMMUNITY

We continue our collaborations outside of the office by participating in volunteer events. In 2023, we volunteered in person and virtually at a variety of nonprofit organizations across Massachusetts.

- 1 Community Servings
- 2 My Brother's Keeper
- 3 Walker Therapeutic and Educational Programs
- 4 Wonderfund of Massachusetts
- 5 Healthy Waltham
- 6 Community Harvest Project
- 7 The Emerald Necklace Conservancy (Boston)
- 8 Ironstone Farm



FELLOWSHIPS AND *MENTORING*

Institute research fellows receive support and regular feedback on their work and strong mentorship to guide their paths toward their desired goals and career trajectories. The Institute leads 5 fellowship programs and welcomes additional fellows outside of official programs.

- Harvard Medical School Fellowship in General Medicine and Primary Care
- Harvard-wide Pediatric Health Services Fellowship
- Fellowship in Health Policy and Insurance Research
- Thomas O. Pyle Fellowship
- Fellowship in Pharmacoepidemiology and Real-world Evidence

- Institute fellows meet as a group regularly to discuss their research, share resources, and build camaraderie.

WE WELCOMED 11 NEW FELLOWS IN 2023

ELLEN DELUCA | MENTOR: DAVENE WRIGHT

MIKE EBER | MENTOR: ANITA WAGNER

SEHWAN KIM | MENTOR: RUI WANG

ALEXANDRA GEANACOPOULOUS |
MENTOR: ALON PELTZ

SOREN HARNOIS-LEBLANC |
MENTOR: MARIE-FRANCE HIVERT

DANIEL HARRELL | MENTOR: ANJUM KHURSHID

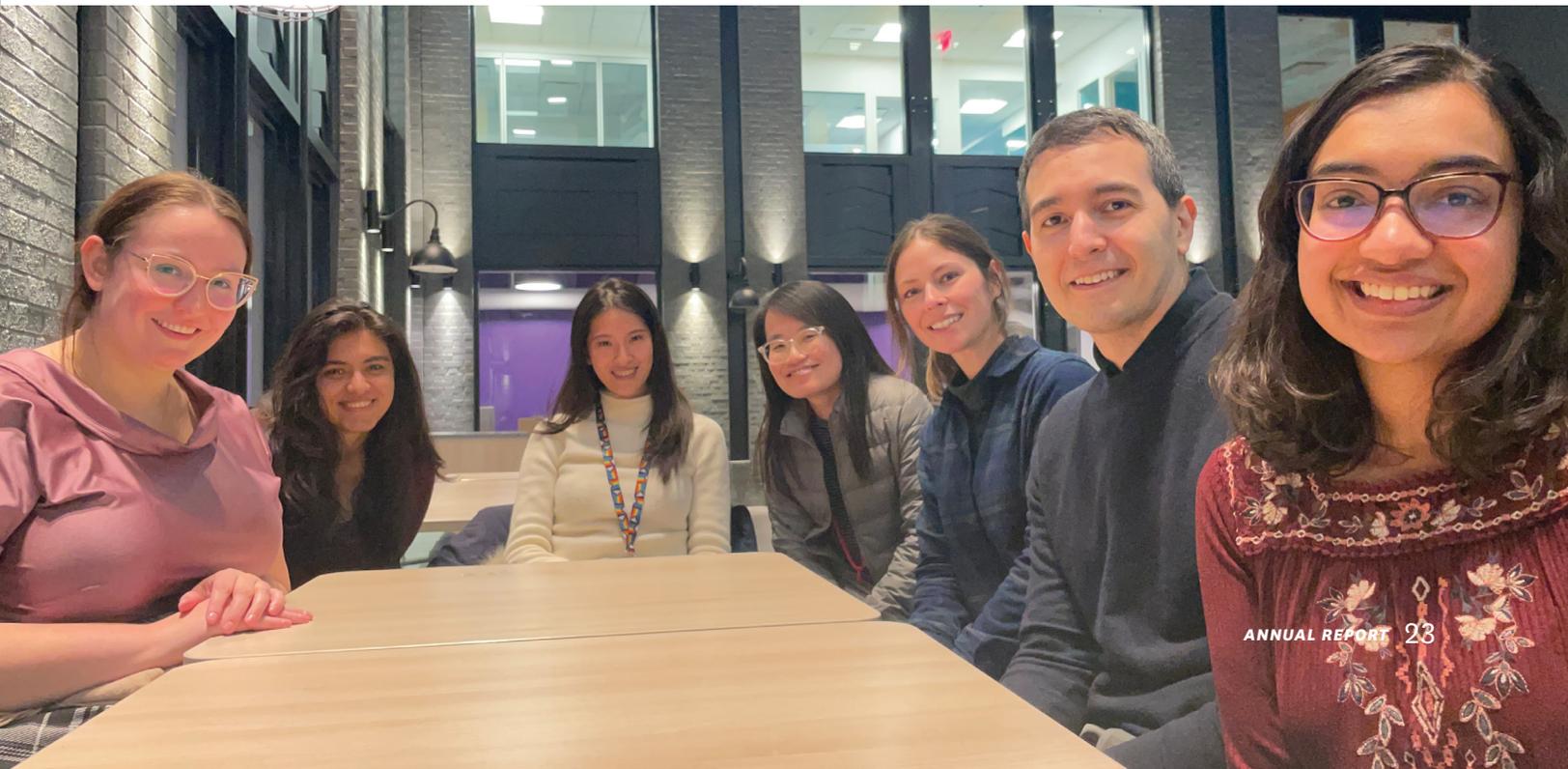
LANDON HUGHES |
MENTOR: BRITTANY CHARLTON

RYAN PERKINS | MENTOR: LAURA GARABEDIAN

YE SHEN | MENTOR: HAO YU

NICHOLAS VENTURELLI |
MENTOR: LAURA GARABEDIAN

LI YI | MENTOR: PETER JAMES



HONORS AND AWARDS

THE SUZANNE AND ROBERT FLETCHER PRIZE IN POPULATION MEDICINE

This annual prize is named for Professors Emeriti Suzanne and Robert Fletcher, who have been national leaders in advancing the field of clinical epidemiology.

SAHIL SANDHU, HARVARD MEDICAL SCHOOL STUDENT

SUBMISSION: Electronic Patient-reported Outcomes: The Missing Link in Population Health Efforts

GORDON MOORE AWARD FOR EXCELLENCE IN MENTORING

The Institute's annual mentoring award celebrates outstanding Institute members who inspire, support, and catalyze a colleague's development to become the best they can be in their careers and lives.

NICOLE BORNKAMP, SENIOR PROJECT MANAGER
DAVENE WRIGHT, ASSOCIATE PROFESSOR

ROBERT H. EBERT CAREER DEVELOPMENT AWARDS

The Institute's career development award, named for the founder of Harvard Community Health Plan and former Dean of Harvard Medical School, provides resources to Institute faculty to develop leading-edge programs in teaching and research and to pursue scientific and professional activities consistent with the Institute's mission.

KURT CHRISTENSEN, ASSISTANT PROFESSOR

Outcomes Toolkit for Genomic Screening

PROJECT: Develop a database of tools and strategies to guide the unbiased evaluation of genomic screening.

ANJUM KHURSHID, MEMBER OF THE FACULTY

Feasibility Study for Setting Up a National HIE Data Network for Supporting Population-based Research

PROJECT: Investigate the feasibility of a national network of Health Information Exchanges, which can provide a geographically comprehensive and interlinked patient-level database in near real-time for epidemiological and population health research.

EBERT FELLOWSHIP, HARVARD MEDICAL SCHOOL ELEANOR AND MILES SHORE FACULTY DEVELOPMENT AWARD

This fellowship is awarded to junior faculty to support research and career development in population medicine.

HADLEY STEVENS SMITH, ASSISTANT PROFESSOR

PROJECT: To understand the value of genomic sequencing at the family level to inform clinical implementation and payment policy by assessing public attitudes and preferences regarding familial communication of genetic results and follow-up testing in relatives.

THE AAKA PANDE AND SUMIT MAJUMDAR MEMORIAL AWARD

The Division of Health Policy and Insurance Research sponsors this annual award, which recognizes the talents of current and former research fellows who are making significant contributions to health policy dialogue through papers, blogs, or op-eds.

MAHNUM SHAHZAD, RESEARCH FELLOW

HARVARD MEDICAL SCHOOL | OUTSTANDING RESEARCH MENTOR AWARD

This student-nominated award by the Harvard Medical School Class of 2023 recognizes those who have made an outstanding impact on its cohort.

XIAOJUAN LI, ASSISTANT PROFESSOR

**HARVARD T.H. CHAN SCHOOL
OF PUBLIC HEALTH |**

LAGAKOS DISTINGUISHED ALUMNI AWARD

This award recognizes Department of Biostatistics alumni whose research in statistical theory and application, leadership in biomedical research, and commitment to teaching have had a major impact on the theory and practice of statistical science.

RUI WANG, ASSOCIATE PROFESSOR

STUDENT MENTORING AWARD

This student-nominated award recognizes an individual who has enriched a student’s academic, professional, or personal development at the Harvard T.H. Chan School of Public Health.

BRITTANY CHARLTON, ASSOCIATE PROFESSOR

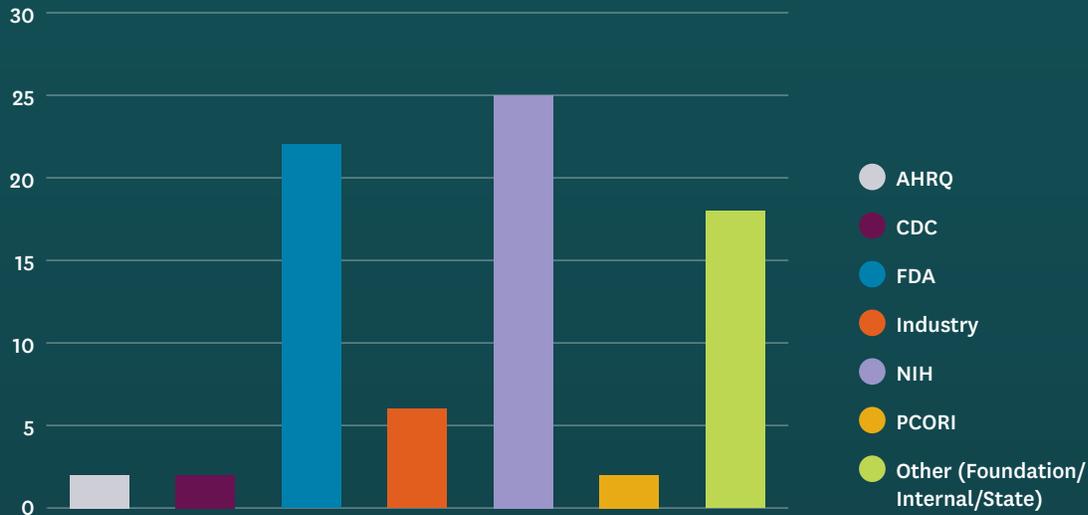


**THE RETURN OF THE ANNUAL
THOMAS S. INUI LECTURE**

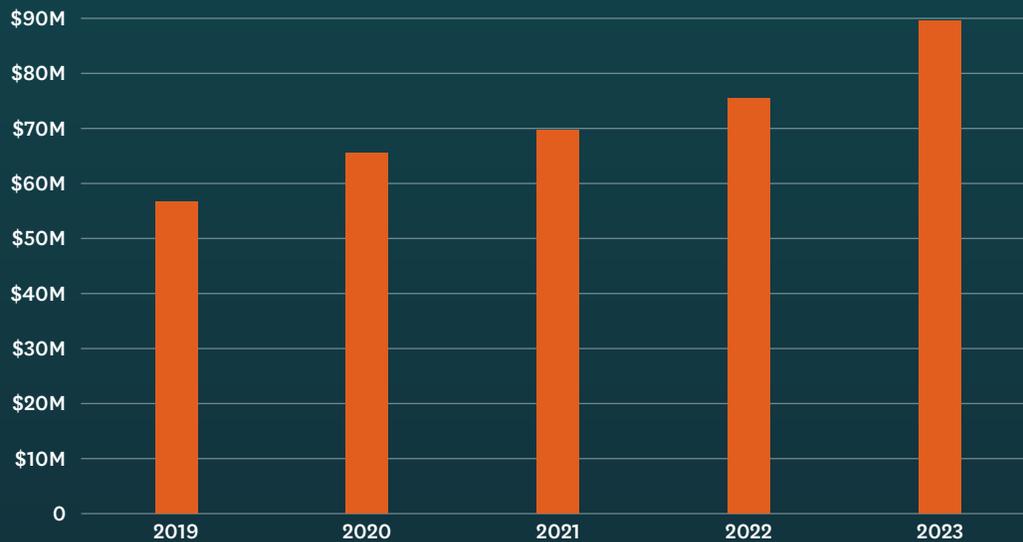
The annual Thomas S. Inui lecture returned after a pandemic-driven hiatus, welcoming Institute alumna Maureen T. Connelly, now Senior Associate Dean for Academic and Community Affairs at the Kaiser Permanente Bernard J. Tyson School of Medicine. As an inaugural member of the school’s leadership team, Dr. Connelly had a front-row seat for the school’s opening in July 2020, and brought 3 years’ hindsight to share with lecture attendees in her talk, “Shifting the Paradigm: Centering a New Medical School in an Integrated Health System”. She discussed the challenges facing medical education through holistic admissions and innovative curriculum, exposure to multiple health systems, service learning, elevation of health systems, and sharing lessons learned for the benefit of other medical education professionals and programs.

2023 *BY THE NUMBERS*

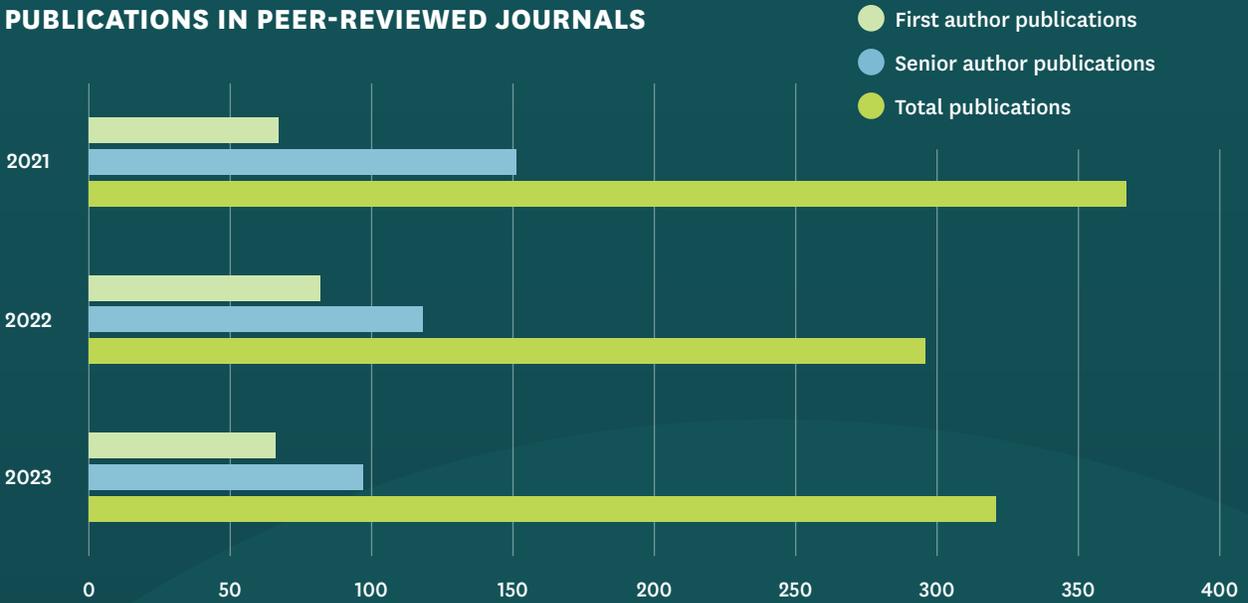
NUMBER OF NEW AWARDS (BY FUNDER)



TOTAL RESEARCH INCOME (IN MILLIONS)



PUBLICATIONS IN PEER-REVIEWED JOURNALS



AWARDS + GRANTS

258 
 ACTIVE GRANTS/CONTRACTS

77 
 NEW AWARDS

148 
 NEW PROPOSALS SUBMITTED

321 
 PUBLICATIONS

\$89.3M 
 IN GRANT/CONTRACT REVENUE

MISSION

The Institute's mission is to improve health care delivery and population health through research and education, in partnership with health plans, delivery systems, and public health agencies.

HARVARD PILGRIM HEALTH CARE INSTITUTE

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DEPARTMENT OF
POPULATION
MEDICINE



Harvard Pilgrim
Health Care Institute