A quarter-century journey to improve health

Celebrating the silver anniversary of the Department of Population Medicine

25

Years

About Us

The Department of Population Medicine (DPM) is a unique research and academic partnership between Harvard Pilgrim Health Care (HPHC) and Harvard Medical School (HMS). The Department, formerly the Department of Ambulatory Care and Prevention (DACP), was created in 1992 to focus on research and education as they relate to the care of large defined populations. We are the nation's only medical school appointing department that sits in a health plan. Since 2009, the Department has been housed in the Harvard Pilgrim Health Care Institute, a limited liability corporation that includes DPM and the Office of Sponsored Programs.

Our Harvard-appointed faculty use our position within both a medical school and a health plan to conduct research to identify effective interventions and systems of care that can improve health care delivery, inform and enhance prevention efforts, evaluate and inform health care policy, and contribute to public health. Our research spans many axes: from prenatal care to palliative care; from ambulatory clinics to intensive care units; and from policy to practice. Although faculty research interests are diverse, the common thread of all of our work is a focus on population health. This big-picture perspective connects individual care to wider systems of care to improve health across the country and the world.

The mission of our Department also includes 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 kinds of diverse health issues that face our society in the 21st century.

It's been an inspiring 25-year journey. Let us tell you about it.

In 1992, the DACP consisted of unfinished and unfilled space, boundless potential and challenges similar to that of any startup built from scratch – securing funding, meeting outside expectations and recruiting top talent with little more than the promise of great things to come. Back then, one could practically hear the ideas bouncing off the walls and reverberating through the warehouse-like space, as the first faculty and staff members worked to implement the vision of the founding Chair, Thomas S. Inui, ScM, MD, MACP: to create a protected environment in which dedicated people could do the work they were passionate about. You could count the employees on two hands.

Today, walk the length of the Department through our divisions, from Therapeutics Research and Infectious Disease Epidemiology (TIDE) to Chronic Disease Research Across the Lifecourse (CoRAL), circle through Health Policy and Insurance Research (HPI) and the Center for Healthcare Research in Pediatrics (CHeRP), and wave at the biostatisticians, until you've covered all 58,000 square feet of our open bright, Art Deco-accented space. You'll hear the sounds of inspiration and collaboration. What does that sound like? Perhaps it's a kickoff conference call for a newly funded project, an impromptu brainstorming session in one of many collaboration-inspiring huddle rooms, a working meeting among the palm trees on our atrium balcony or a videoconference with medical students across the world in the Inui meeting room. As the DACP evolved into the DPM over two and a half decades, it steadily outgrew not one, but two office spaces before landing in our state-of-the-art facility in the historic Landmark Center. Today, the Department's faculty and staff number in the 200s – and climbing.

Twenty-five years after our humble beginnings, our network spans the globe, with alumni in 22 states and 20 countries. The Department of Population Medicine remains agile and strong, one of fewer than 10 departments of population medicine/health located in a medical school in the United States. **In other words, we've been on the cutting edge of a trend since before it existed.**

I invite you to read on to learn more about how we got started, and what we've been up to.

Richard Platt

Richard Platt, MD, MSc
Professor and Chair, Department of Population Medicine

Founding DPM: Answering the need for a

In the late 1980s and early 1990s, many health care services shifted from the hospital to the ambulatory setting. To ensure that medical students gained important clinical decision-making, diagnostic and therapeutic skills, a greater emphasis on teaching and research in ambulatory practice was needed. In addition, while the public was showing an increasing awareness of and interest in health promotion and disease prevention, most medical students felt inadequately trained to guide their patients about these topics.

At the time, Harvard Medical School (HMS) did not have a department whose mission included prevention, primary care, ambulatory care and clinical research – all new topics in medical teaching. Moreover, the newly created Ambulatory Care Clerkship, required for all Harvard medical students, lacked available teaching sites. This need for more teaching opportunities prompted HMS Dean Daniel Tosteson, MD, and Executive Dean James Adelstein, MD, PhD, to reach out to Gordon Moore, MD, MPH, and Stephen Schoenbaum, MD, MPH, physician-leaders at Harvard Community Health Plan (HCHP, which later evolved into Harvard Pilgrim Health Care) about collaboration. As HCHP included both teaching and research in its mission when HMS Dean Robert H. Ebert, MD, DPhil, AM, founded the managed care organization in 1969, HMS and HCHP saw a new joint venture as a way to give greater emphasis to this mission.

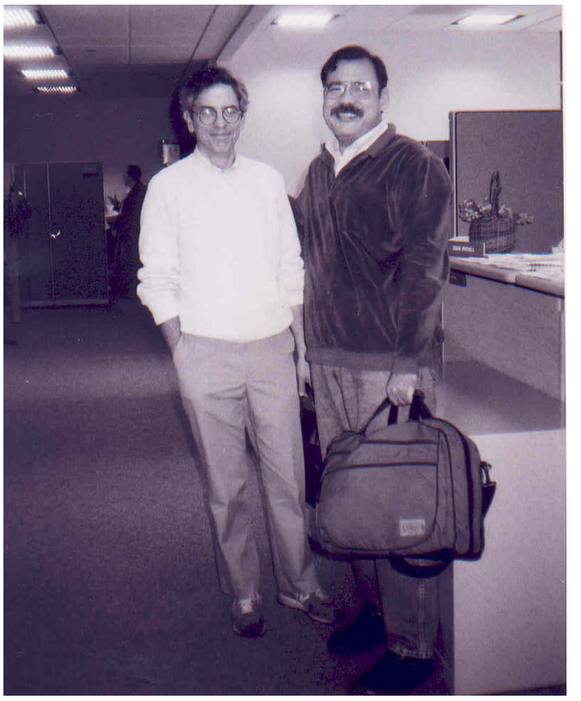
A partnership is born

These discussions led to the creation of the new Department of Ambulatory Care and Prevention (now known as the Department of Population Medicine), launched in 1992 with a mission to develop educational and research programs for preventive medicine, and for the practice of medicine in the ambulatory setting. After a nationwide search, Thomas S. Inui was recruited to become the first Chair of the Department at HMS and the Medical Director for Research and Teaching at HCHP.

With a Department Chair in place, a search committee was formed to recruit multiple faculty members to the new Department. Within the first year, this committee recruited several faculty, staff, and one fellow to join this new venture.

Meanwhile, the Drug Policy Research Group (now the Division of Health Policy and Insurance Research, HPI), which had been founded within HMS's Department of Social Medicine in 1989, was looking for a new home to better support its global and domestic focus. Convinced by Dr. Inui that their work would flourish in this new department, the Drug Policy Research Group transitioned over in 1993, becoming the department's first research group. *(For more information on HPI, see page 13.)*

new approach



Current Department Chair Richard Platt (L), with founding Department Chair Thomas S. Inui (R), 1995

Around the same time, the core faculty of the HCHP Teaching Center – the state-of-the-art teaching facility led by Director Gordon Moore – decided that merging with the Department was a logical next step. Moore proposed to Inui that the two departments join forces in a partnership, as their missions were strikingly similar. Bringing the HCHP Teaching Programs into the Department was a natural progression of the long-standing support each institution had historically offered the other. Thus, the overlapping teaching and research missions of the Department were born.

Changing of the guard

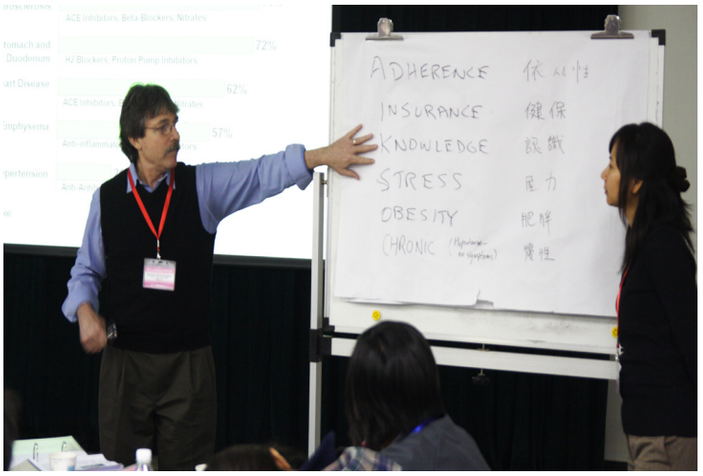
In 2000, after eight years of leading the Department, Thomas Inui stepped down as Chair. Richard Platt, MD, MSc, was appointed Interim Chair upon his departure, and was appointed Chair in 2003. In 2009, the Department was renamed the Department of Population Medicine to more accurately reflect our mission. In addition, a new organizational structure was put in place to accommodate the Department's size and administrative complexity, focusing on streamlining reporting and decision processes. Our corporate home became the newly created Harvard Pilgrim Health Care Institute. HPHC provides management oversight of the Institute, while HMS provides academic oversight and departmental reviews. In this way, the Department benefits from its continuing organizational relationships with both HMS and HPHC.

"What an opportunity DACP/DPM represented! To prime the pump for research, Dan Tosteson and HMS provided sufficient resources to recruit an inaugural cohort of faculty and a 'ladder' to grow as we garnered grants. Integrating the superb Teaching Center faculty and research faculty created a 'full service' academic department in Harvard Community Health Plan, a fulfillment of Bob Ebert's vision. It was my privilege to pursue this development within an exemplary health care delivery system with an enrolled population, an electronic medical record, a foundation dedicated to academic activities and community service, and executive leadership dedicated to innovation and continuous quality improvement."

Thomas S. Inui, ScM, MD, MACP, Founding Chair

Teaching:
A hotbed of inspiration ar

We lead robust teaching activities that integrate population health in the training of medical students, residents, doctoral and post-doctoral research fellows, policy makers, and health system leaders, to improve the health of populations through clinical care, research, and delivery system and health policy leadership. All training experiences are informed by the health system and population perspectives of DPM, and all faculty members.



Faculty members Dennis Ross-Degnan (L) and Christine Lu (R) lead a Medicines and Insurance Coverage Initiative (MedIC) course on Pharmaceutical Policy Analysis in Beijing, China, 2009

Sowing seeds of a new model

Our teaching history began 11 years prior to the launch of the Department with the formation of the Teaching Center at HCHP in 1981. Founding faculty Gordon Moore and James Sabin, MD, believed that medical teaching and research should be based within clinical practice. An energetic hub of activity, the Teaching Center produced many cutting-edge educational innovations, including the development of the Longitudinal Internship in Clinical Medicine, a two-year course in which Harvard medical students studied topics such as statistics and epidemiology, and the Ambulatory Care Clerkship at HMS, which had its pilot at HCHP. Dr. Moore applied the ideas developed at the Teaching Center to design the New Pathway for HMS, Harvard's ground-breaking student-directed curriculum. With the creation of the HMS/HCHP Department of Ambulatory Care and Prevention in 1992, the incorporation of the Teaching Center within this newly formed joint department was a natural fit.

Creating a nurturing environment

From its start, the Teaching Center served as a home for those with an innovative spirit and a love of learning as well as teaching. Early members of the Teaching Center recall it as a nurturing environment for those willing to experiment with new ideas, however unconventional, in the interest of advancing learning. With a founding mission to advance medical education, particularly where managed care could offer a differentiating experience for health care students, the Teaching Center provided students with a broad-based education focused on the patient, as well as larger populations and systems of care that prepared them to be good caregivers.

As the health care landscape changed and evolved, so did the need for adaptable teaching programs to keep pace. Initially, Department faculty and staff led five courses in which Harvard Community Health Plan served as a

nd initiative

primary teaching site. Developing curricula and fine-tuning them as the health care landscape changed became something of a department specialty.

Today, we lead teaching programs supported by a range of local, national and international sponsors. Our teaching programs consist of four domains: coursework; mentoring activities; training programs; and national leadership of training in systems and practice improvement. These domains use different teaching strategies and occur in a variety of settings, including ambulatory clinics, hospitals, research offices, and national and international courses.

Instilling skills and knowledge

DPM has taken the lead at HMS in training medical students in both the interpretation of evidence to inform practice and in the integration of population health perspectives into their professional roles. Our courses instill clinical skills, as well as a sound knowledge of public and population health issues, including innovations in science and medicine, health care insurance systems, and disease prevention.

A Foundation for the Future: The Five Original Courses

Patient/Doctor I
Patient/Doctor II
Epidemiology and Critical Reading of the Literature
Nutrition and Preventive Medicine
Ambulatory Care Clerkship

The integration of Clinical Epidemiology and Population Health

Since 1996, DPM faculty have led the HMS Clinical Epidemiology course, a required part of the curriculum for first-year medical and dental students. In its original form, the course focused on study design, diagnostic testing, clinical decision making, and critical reading of the literature. DPM faculty who led this course include William Taylor, MD, Matthew Gillman, MD, SM, and Steven Simon, MD, MPH.

In 2005, with leadership from DPM faculty, Harvard Medical School was selected as a Regional Public Health-Medicine Health Educational Center by the Association of American Medical Colleges and the US Centers for Disease Control and Prevention. A primary initiative of this Center was the development of a new course for first-year medical and dental students entitled "Clinical Epidemiology and Population Health," introduced as a component of a larger curriculum redesign initiative at Harvard Medical School. Center Director Jonathan Finkelstein, MD, MPH, and co-Director Emma Morton-Eggleston, MD, MPH, broadened the focus of the course to include Population Health, as well as Clinical Epidemiology. This new version used examples such as obesity, breast cancer and tobacco to examine population-level approaches to improving health. The course also addressed the role of health care delivery and public health systems in public health emergencies through a "table top" simulation of an influenza pandemic. This approach encouraged all students, regardless of career path, to develop an appreciation of the continuum of medical care for individuals and the health of populations.

In 2015, HMS initiated another major overhaul of in-classroom learning, restructuring 21 months of pre-clinical coursework into 14 months to expedite students' progression to clinical work in a hospital setting. The former one-time course has evolved into a longitudinal curriculum, with sessions interspersed throughout the four years of medical school. Clinical Epidemiology and Population Health is a core component of the January Essentials of the Profession I course, which also incorporates ethics, social medicine and health policy content. Special sessions are co-taught with clinical experts, focused on the application of evidence to inform physical examination and diagnosis. Other sessions guide students in how to find, appraise and apply evidence in practice. Today, DPM faculty are developing Essentials of the Profession II, a required month-long course for third- and fourth-year students that will incorporate components of case-based collaborative learning as developed at Harvard Business School, and focus on real-world application of clinical epidemiology and population health tools. Laura Garabedian, PhD, Jason Block, MD, MPH, and Emily Oken, MD, MPH, developed and co-direct this curriculum, joined by over a dozen other DPM faculty who teach in these multiple settings.

A multi-faceted approach to mentorship

Our strong tradition of mentorship is built on processes to support professional development at all stages of career advancement. Our faculty have received multiple honors for mentoring, including prestigious mentoring awards from Harvard Medical School and the Harvard T.H. Chan School of Public Health.

Students - The Scholars in Medicine program (SiM) provides students at Harvard Medical School with the opportunity to perform a mentored, scholarly project with members of the faculty. DPM is actively involved with this program through mentoring students and serving on proposal review committees. DPM faculty also mentor medical, public health and graduate students on a large variety of other projects, including international projects.

Annual Review Process – Since its inception, the DPM has conducted and continually evolved an active internal mentoring program through multiple processes that include faculty at all ranks, and culminate in an annual Department-wide faculty performance review. The DPM's mentoring program changes the culture of mentoring by moving beyond the traditional one-to-one mentoring model to engage the entire faculty. It highlights the importance of mentorship and demonstrates to all faculty the value that senior leadership and the entire faculty place on supporting each member's successful development. Tangible results of the program have included the establishment of funded Departmental career development awards for both junior- and mid-career faculty (the Robert H. Ebert Faculty Development Awards), and the creation by mid-career faculty of two cross-Departmental centers of excellence in areas in which DPM faculty lead research: the Precision Medicine Translational Research and the Cancer Policy and Program Evaluation Centers. DPM's approach was identified as a model process during external review of the department. It has been disseminated to the Kaiser Northern California Division of Research and the Environmental Influences on Child Health Outcomes Program at the National Institutes of Health.

Cultivating skills and honing futures

DPM is home to pre- and post-doctoral programs that serve trainees from clinical and research disciplines. While each has its own structured curriculum, mentored research and connection to other Harvard resources, the programs all have in common the health system and population focus of DPM. In our 25-year history, DPM faculty have mentored almost 150 pre- and post-doctoral fellows from 20 countries. In fact, 12 current DPM faculty members were trained in DPM fellowships. Residency and fellowship graduates have gone on to positions at major universities, leading roles in government (including Surgeon General), editorial roles at major publications and more.

"Over the past 25 years, DPM has been involved with teaching at all levels, from medical and other graduate students, to residents, and to graduate doctors. The common thread has been a passion to focus on learning rather than teaching. That has meant activating learners to become self-directed, involved, and committed to being the best they can be. That goal binds us together as a teaching faculty and is a large factor, not just in our success in preparing many graduates for their careers, but also in making our educational efforts rewarding for those who have and continue to teach."

Gordon Moore, MD, MPH, Founding Director, DPM Teaching Programs

Fellowships and programs include:

Health Policy and Insurance Research Fellowship
This fellowship addresses the gap between research evidence and policy by training clinician-researchers, PhD students, post-doctoral students, mid-career university faculty, and policy decision makers. It's the country's first medical school-based program to train future leaders in research on the impact of pharmaceutical policy decisions. Since 2001, the fellowship has trained 42 pre- and post-doctoral fellows and 10 visiting scholars from 16 countries.

General Internal Medicine and Primary Care Fellowship
Harvard's nationally recognized Fellowship Program in General Internal Medicine and Primary Care includes six sites: Beth Israel Deaconess Medical Center, Brigham and Women's Hospital, Massachusetts General Hospital, VA Boston Healthcare System, Cambridge Health Alliance and DPM. This program provides research, training and mentorship to post-doctoral fellows who have already demonstrated outstanding clinical skills in internal medicine. Thirteen general medicine fellows have been trained at DPM.

Pediatric Health Services Research Fellowship
The Harvard-wide Pediatric Health Services Research Fellowship trains researchers to address critical gaps in medical care for children, including socioeconomically disadvantaged and minority populations. The program benefits from an established collaboration of faculty at Boston Children's Hospital, Massachusetts General Hospital for Children, the Institute for Healthcare Improvement and DPM. Since 1999, 29 pediatric health services research fellows have been trained at DPM.

Primary Care Residency Program
Established in 1990, the Residency Program in Primary Care and Population Medicine is a collaboration among a tertiary academic hospital (Brigham and Women's Hospital), a system of connected outpatient care practices (Atrius Health) and a medical school department (DPM). These institutional arrangements and progressive educational program have supported medical residents who are making noteworthy contributions to the improvement of health care delivery and population health. One hundred primary care residents have been trained at DPM.

A national training initiative focused on systems and quality improvement

In 1996, the Pew Charitable Trusts selected the Department to be the Program Office of a national initiative to introduce a new set of competencies into the post-graduate training of primary care doctors and advanced practice nurses. The program, called Partnerships for Quality Education, was picked up by the Robert Wood Johnson Foundation, which supported the initiative until 2010. During this time, the program supported hundreds of primary care doctors and nurses studying to be nurse practitioners at 38 different academic sites. Each program designed and delivered an educational experience, developed in academic collaboration and with financial support from the Department, to teach its trainees about systems thinking, population medicine and quality improvement.

Faculty members Jason Block (L) and Emily Oken (R) receive the Excellence in Mentoring Awards from Harvard Medical School in recognition of their distinguished records of mentoring, 2017

Research:
A sharp focus on actionab

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

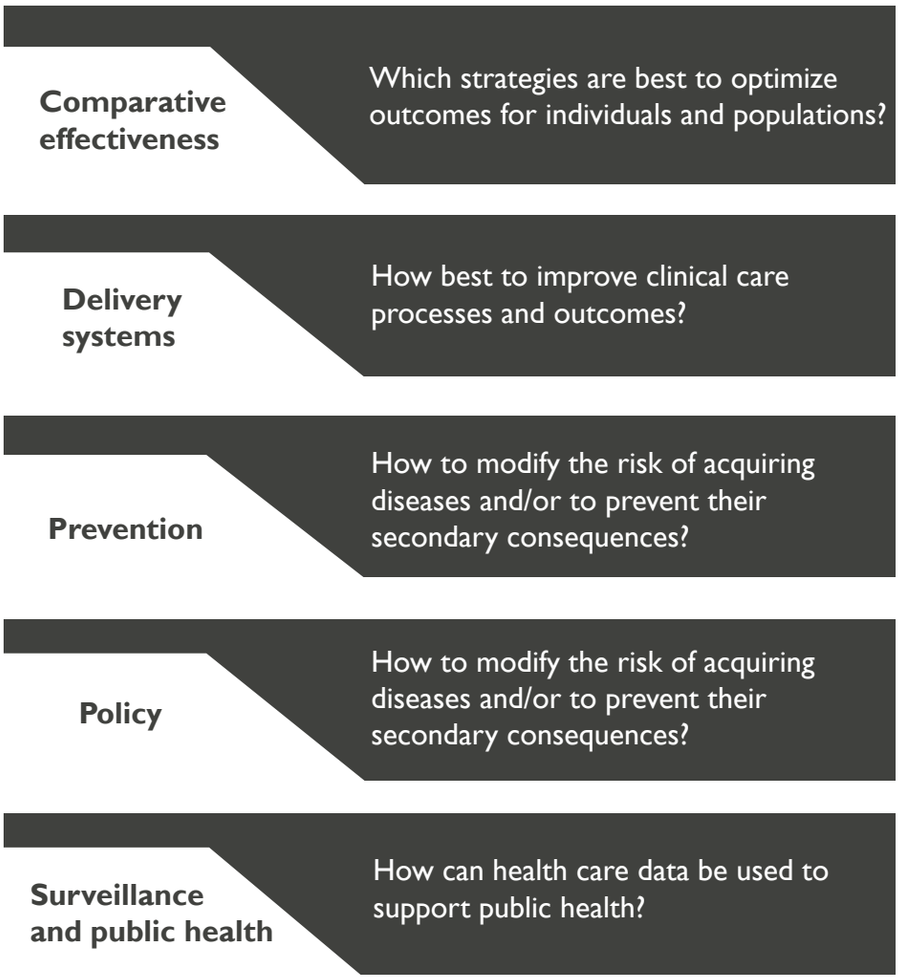
Our work blends a population and public health focus, is anchored in health care delivery, and leverages unprecedented data resources derived from health care delivery systems. Much of our research generates immediately actionable findings that lead to concrete changes in local, national, and international policies and procedures.

"When Steve Soumerai and I first discussed moving the Drug Policy Research Group to the newly formed Department of Ambulatory Care and Prevention in 1993, we were captivated by Tom Inui's vision of creating a collaborative, nurturing, and academically stimulating setting in which bright and committed faculty members could pursue research that was important to them and to society. What an ambitious idea! Tom, and now Rich Platt, have succeeded in building a thriving and constantly evolving department where world-class research and teaching take place, but where everyone also looks forward to coming to work every day. It's been a wonderful 25 years."

Dennis Ross-Degnan, ScD, Director of Research, DPM

le findings

Our research is focused in the following areas:

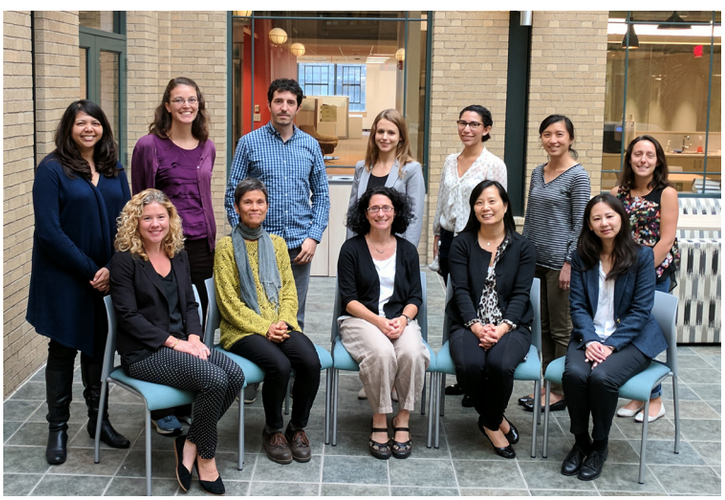


Research faculty members are aligned with one or more research divisions. Here's a snapshot of the divisions and highlights of their work.

Center for Healthcare Research in

CHeRP | CENTER FOR HEALTHCARE RESEARCH IN PEDIATRICS

The mission of CHeRP is to conduct research that enhances health care decision making by patients and their families, clinicians, and policymakers, and improves the quality of pediatric care in health care delivery systems. Founded in 2003 as the Center for Child Health Care Studies, the Center is a multidisciplinary group that conducts a broad range of research to drive improvements in population health for infants, children and pregnant women, using rigorous methodologic approaches. Current areas of excellence include: vaccines, asthma, cancer, precision medicine, health insurance design and the implementation of science/health communication research. After the departure of founding Director Tracy Lieu, MD, MPH, in 2012, the Center was rebranded as the Center for Healthcare Research in Pediatrics. CHeRP researchers leverage collaborations with health insurers, public health departments and national health care delivery systems to identify optimal approaches to improve health care quality and population health.



Current CHeRP faculty, staff, and trainees

Asthma

Asthma is the most common chronic disease of childhood. Our research focuses on understanding disparities in asthma, improving adherence to medications and identifying genetic factors that may affect response to medications. The NIH-funded Parents, Asthma and Communications Experiences study (PACE), which examined factors that limit adherence to preventive asthma medications in children, was awarded in 2003. It became the springboard for ongoing DPM work in asthma, including the establishment of the Population-based Effectiveness in Asthma and Lung Diseases (PEAL) Network, a collaboration with five external research groups launched in 2010. In addition, in 2015, the Age-Dependent Pharmacogenomics of Asthma Treatment (ADAPT) studies were initiated with the goal to improve understanding of pharmacotherapy for asthma in order to allow individualized treatment in children with asthma using genetics and genomics.

Asthma highlights include:

- Determining risk factors for suboptimal control of asthma and controller medication underuse among children
- Identifying that mismatching exists between guidelines, providers and parents on asthma medication use
- Determining the impact of copayment changes on children's albuterol inhaler use and costs after the Clean Air Act Chlorofluorocarbon ban
- Discovering multiple genes associated with the development of asthma and response to asthma medications

Pediatrics (CHeRP)

Childhood Infections

CHeRP researchers have conducted community-based research on common childhood infections, examined the impact of vaccines on antimicrobial use and resistance, conducted nearly real-time surveillance of adverse events associated with vaccines, evaluated the impact of costs and cost-effectiveness of vaccines on population health, and led hospital-based research networks to support prevention of infections in neonatal and pediatric settings.

Health Policy

In the past 14 years, CHeRP faculty have been on the forefront of child health policy research. Much of this work has focused on evaluating the impact of new health insurance designs on the health and health care of children and families. Our faculty conducted some of the first studies of high-deductible health insurance plans starting in 2005. These studies have employed a number of different approaches to provide a rich understanding of complex, evolving insurance policies, including quasi-experimental claims-based analyses, survey research and qualitative methods. This line of research continues today with a recently awarded PCORI-funded project to study the impact of preventive drug lists for families with asthma in high-deductible plans. Our research also has focused on the impact of health reform policies such as health insurance exchange plans, and dependent coverage expansions on health plan decision making, coverage, and costs. This ongoing work continues to inform policy deliberations. Center faculty have also focused on whether payment policies, such as the hospital-acquired conditions policy or value-based purchasing, have led to meaningful improvements in patient outcomes.

"The mission of the Center for Healthcare Research in Pediatrics (CHeRP) is driven by the goal of improving pediatric medical care. Our focus areas include current or emerging issues affecting health care for children. Our multidisciplinary research helps inform those caring for our children–families, clinicians and policymakers."

Ann Chen Wu, MD, MPH, Interim Director, CHeRP

Childhood Infections highlights include:

- Leading one of the largest longitudinal studies of colonization with pneumococcus, a major cause of disease in children worldwide, including investigations of the impact of newly introduced vaccines on carriage, disease and resistance
- Leading a randomized behavior change intervention trial in Massachusetts to promote judicious antibiotic use
- Informing national policy recommendations by the Advisory Committee on Immunization Practices on Tdap use in the U.S.
- Examining the risk of febrile seizures after the measles-mumps-rubella-varicella vaccine, and following simultaneous administration of influenza and pneumococcal vaccines, leading to changes in CDC recommendation or in the Vaccine Information Statement provided to families of young children

Health Policy highlights include:

- Finding increased risk for delayed and forgone care and health care-related financial burden among families with chronic conditions in high-deductible plans, especially for those with lower incomes
- Demonstrating that children are also at risk for delayed and forgone care in high-deductible plans, but not for preventive services that are exempt from the deductible
- Identifying challenges faced by families choosing and using coverage from health insurance exchanges, and risk factors for experiencing shopping challenges and financial burden from out-of-pocket costs
- Demonstrating the lack of impact of payment penalties implemented by CMS on rates of healthcare-associated infections in over 400 U.S. hospitals.

Chronic Disease Research Across t

CoRAL
DIVISION OF
CHRONIC DISEASE RESEARCH ACROSS THE LIFECOURSE

Founded in 2006 by Matthew Gillman as the Obesity Prevention Program (OPP) and currently led by DPM Vice-Chair Emily Oken, **the mission of the DPM's CoRAL Division is to lessen the burden of chronic diseases and obesity-related disorders by conducting research studies within defined populations.** CoRAL is a multidisciplinary program that fosters collaboration among research investigators, both nationally and internationally, and across the Harvard campus. It serves as a springboard for training the next generation of researchers in chronic disease and obesity prevention. Over the 11-year life of OPP/CoRAL, dozens of faculty, research scientists, staff and trainees have worked together to produce a large body of influential research.

Current CoRAL faculty, staff, and trainees

Project Viva

Project Viva is the first, and still one of very few, modern U.S. cohorts to make lifecourse epidemiology a primary focus. Between 1999 and 2002, Project Viva enrolled over 2,600 mothers in early pregnancy and 2,128 single-birth infants, and has followed over 1,200 of them for almost two decades. Viva has served as fertile ground for many novel and seminal papers, including analyses of associations between maternal gestational weight gain and offspring obesity; infant sleep and childhood obesity risk; the combined public health impact of multiple pre- and peri-natal risk factors on obesity; prenatal fish, mercury, and offspring cognition; maternal vitamin D status and offspring asthma; and neonatal leptin levels as a driver of infant growth and later obesity. Project Viva is currently funded through at least 2022 and will follow mothers and their offspring into late adolescence and early adulthood.

CoRAL's three primary areas of

- **Epidemiologic studies** of the development of chronic metabolic syndrome, diabetes, cardiovascular disease, airwa This area invokes the life course approach to chronic disea earliest stages of human development.

- **Interventions** to prevent chronic diseases. This area's f primary care settings, with an additional interest in commu

- **Health services research** on the effects of prevalence relation to:
  - Health plan policies and programs
  - Clinical therapeutic interventions such
  - Decision support or new technology fo
  - Cost-effectiveness of clinical and policy

he Lifecourse (CoRAL)

PROBIT (the PROmotion of Breastfeeding Intervention Trial)

The PROBIT study is the largest-ever randomized controlled trial to examine the effects of breastfeeding on children's later health outcomes. In 1996 and 1997, researchers enrolled 17,046 children born at 31 maternity hospitals in Belarus in the PROBIT study. Half of the hospitals were randomly selected to adopt the World Health Organization's "Baby-Friendly Hospital" Initiative, which promotes breastfeeding and provides support to new mothers and babies; the other hospitals continued their usual practices. On average, babies born at the "Baby-Friendly" hospitals were exclusively breastfed for longer than those born at the control hospitals. In initial analyses, babies who were breastfed longer were found to be less likely to contract gastrointestinal infections or atopic eczema during their first year of life. CoRAL researchers joined the PROBIT team in 2007 and have examined the associations of prolonged and exclusive breastfeeding with childhood height, weight, adiposity, blood pressure, cognitive ability, lung function, vision and other health outcomes through adolescence Results from PROBIT have led to more than 40 publications and have influenced guidelines for infant feeding.

"In CoRAL, all the work we do emerges from the simple premise that prevention is better than cure. We conduct research to understand which exposures, behaviors, and experiences can set an individual on the path towards health and wellness, or alternatively on a trajectory of greater risk for disease, disability, and premature death. We then work to translate our new knowledge into policies and interventions that promote health."

Emily Oken, MD, MPH, Director, CoRAL

research expertise are:

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Health Policy and Insurance Researc

Founded by Stephen Soumerai, ScD, and Dennis Ross-Degnan, ScD, and currently led by Frank Wharam, MB, BCh, BAO, MPH, **the mission of HPI is to produce rigorous evidence and build research capacity to inform the development of health policies and health system innovations that improve access to care and health outcomes, especially among vulnerable populations in the United States and around the world.** For more than 20 years, HPI faculty have published studies on pharmaceutical use in large populations, methods for improving clinical decision-making, and the effects of changes in health insurance coverage in the U.S., Europe, Canada and developing countries. HPI faculty and their work are widely recognized nationally and internationally.

Current HPI faculty, staff, and trainees

Understanding the pitfalls of medicine cost containment

Dr. Soumerai was Principal Investigator of three widely-cited NIH studies (published in NEJM) which show that arbitrary Medicaid drug payment caps (e.g. three-prescription limits) adversely affect health status and increase more costly hospitalization and nursing home admissions among the poor and chronically ill (including chronically elderly and the severely mentally ill). One study found that denying access to medications for mental illness increased the costs of emergency mental health services and partial hospitalization 17 times more than the drug "savings," which did not account for the unquantifiable increase in the pain and suffering of patients and their families. In essence, limiting drug coverage was found to be "penny-wise and pound foolish." The belief that no one should become impoverished by their need for medically essential drugs was backed up by sound research and evidence, with far-reaching policy impacts:

- The study was used by Congress and the Centers for Medicare and Medicaid Services to create the low-income subsidy in the first prescription drug benefit in Medicare, the largest Medicare reform to date. This allowed millions of elderly beneficiaries to gain drug coverage if their incomes were between poverty and 150% of poverty.

- The National Alliance for the Mentally Ill (NAMI) developed a 10-point policy to ensure access to effective medications for people with severe mental illnesses in state Medicaid programs.

- AARP has used findings from the study to advocate for expanded prescription drug coverage for low-income persons and against restrictions on prescription drug coverage in states including New York, Massachusetts, Wisconsin, Texas and Illinois.

- Based in part on HPI studies, the government of Australia rejected proposed drug benefit limits, and Quebec, Canada, agreed to reverse a province-wide high-deductible medication plan for welfare patients.

h (HPI)

"The motto of Harvard is veritas – truth. Indeed, "truth" is emblazoned on a shield as if protecting from other influences on learning and society. I believe that when studying effects of health policies, we can find true answers and that investigators must make exhaustive efforts to arrive at such truth. These rigorous answers can then become the foundation for health policies that promote well-being, equity, and life for all members of our society."

Frank Wharam, MB, BCh, BAO, MPH, Director, HPI

Global leadership in improving use of medicines

To provide evidence for policy making, HPI's global programs focus on developing, implementing, evaluating and disseminating results from innovative approaches to medicines policy, quality improvement and systems change, in partnership with ministries of health, health delivery systems, and communities. Led by Dr. Ross-Degnan and Anita Wagner, PharmD, MPH, DrPH, HPI's global work encompasses applied health systems research, professional in-service training and program evaluations, conducted with support from the World Health Organization (WHO), the U.S. Agency for International Development, the UK Department for International Development, the Gates Foundation and the World Bank, among others. From 2003 to 2012, in recognition of its leadership globally and within countries, HPI was home to the WHO Collaborating Center on Pharmaceutical Policy. HPI faculty have provided technical leadership in the development of WHO publications that describe standard methodologies for measuring appropriate use of medicines, medicines prices, adherence to antiretroviral therapy and household access to medicines in low-resource settings.

In response to recommendations by international experts, HPI has developed the Medicines and Insurance Coverage (MedIC) Initiative, a global partnership between academics, health care delivery systems, health financing institutions and international organizations. Under the leadership of Dr. Wagner, HPI faculty and fellows have published some of the seminal work on the effects of insurance benefit policies in low- and middle- income countries and have conducted a series of training programs on pharmaceutical policy development in insurance systems in Africa and Asia. In 2016, Drs. Wagner and Ross-Degnan also authored the chapter on promoting quality use of medicines in the 2016 report on Essential Medicines for Universal Health Coverage by the Lancet Global Commission on Essential Medicines.

Exploring the impacts of high-deductible health plans

HPI investigators, led by Dr. Frank Wharam, published rigorous evaluations of modern high-deductible health plans (HDHPs). Early studies in the HPHC population detected surprising levels of value-seeking behavior among high-deductible members such as reductions in low-severity (but not high-severity) emergency department visits, and substitution of low-cost for high-cost colorectal cancer screening. However, studies also detected potentially concerning findings among low-income HDHP members including large reductions in high-severity emergency department visits and hospitalizations.

To address crucial unanswered questions about vulnerable populations and the potential adverse health outcomes of HDHPs, the HPI team has worked in recent years with a large national health insurer's claims, currently covering over 65 million people from 2000 to 2016. Studies have revealed that the Affordable Care Act improved colorectal cancer screening among HDHP members, but that HDHPs were associated with increased emergency department visits and visit acuity for diabetes complications among low-income patients. Through these and other high-visibility projects, HPI faculty have become pioneers in using "big data" to rigorously evaluate health policies. For example, other studies have examined the controversial 2009 change in screening mammography recommendations, bariatric surgery outcomes, interventions affecting opioid misuse and the impacts of the Choosing Wisely campaign. The faculty members and analysts on the HPI team have assembled the data into a readily analyzable learning laboratory that will be used for rich "big data/big policy" research for years to come.

Therapeutics Research and Infectiou

Founded by Director and Department Chair Richard Platt, the Division of Therapeutics Research and Infectious Disease Epidemiology (TIDE) has pursued two major streams of work. **The first is to bridge the gap between clinical medicine and traditional public health, particularly by developing, implementing and disseminating ways to use routinely collected electronic health information that arises from clinical care to monitor the health status of entire populations.** To do this locally, TIDE investigators have partnered with large group practices in Massachusetts, especially including Atrius Health, Fenway Health, the Cambridge Health Alliance and the Massachusetts League of Community Health Centers.

Nationally, TIDE investigators served as founding partners of the Health Care Systems Research Network (formerly the HMO Research Network), a network of research departments attached to health care systems and health plans. TIDE also developed partnerships with national insurers Aetna, Humana, Optum and the HealthCore (Anthem). In support of this work, TIDE investigators pioneered the development of public domain software, such as PopMedNet (www.popmednet.org), and analytic methods to enable large-scale distributed analyses that allow the original data owners to collaborate in creation of very large populations without having to share individual-level data. **The second major research domain is in clinical trials, especially hospital-level cluster randomized trials of methods to prevent healthcare-associated infections.** The Hospital Corporation of America has been TIDE's principal partner in this arena. TIDE is also home to Patient Oriented Research in the Epidemiology of Skin Diseases (PORES), a collaborative unit between the Department of Dermatology at Massachusetts General Hospital and DPM. The unit conducts clinical and epidemiologic research related to skin diseases.

Medical Product Safety Assessment

TIDE investigators have been continuously funded by the FDA since 1986 to work with it in developing and implementing methods to use administrative and electronic health record data to assess the safety of drugs, biologic agents and vaccines. Since 2009, TIDE investigators have led the development of the congressionally mandated FDA Sentinel System, a collaboration involving 17 data partners and nine academic institutions (www.sentinelinitiative.org). The Sentinel System operates a distributed data network comprising over 400 million person-years of highly curated data that the FDA now uses routinely to support its regulatory and public health functions. TIDE investigators and staff are working to make the

The Sentinel team with former FDA commissioner, Dr. Robert Califf, 2016

s Disease Epidemiology (TIDE)

Sentinel capabilities into a national resource that supports many uses, through the NIH Health Care Systems Research Collaboratory Distributed Research Network, the Reagan-Udall Foundation's IMEDS program and via collaboration with PCORI's PCORnet program.

Infectious and Chronic Disease Surveillance

TIDE investigators have a longstanding partnership with the Massachusetts Department of Public Health (MDPH) to use electronic health record data to support next-day detection of notifiable diseases such as hepatitis, HIV and tuberculosis, weekly assessment of influenza-like illness, and as-needed monitoring of chronic illness and its treatment. Conditions under surveillance include obesity, hypertension and diabetes, as well as treatment patterns. This system, called MDPHnet in Massachusetts, is a distributed data network currently deployed in practices covering approximately 25% of the state's population. The system was developed with support from the Centers for Disease Control and the federal Office of the National Coordinator for Health Information Technology. TIDE now operates and enhances the system under contract from the state. The software developed to support this system, ESP (Electronic health record Support for Public health), is in the public domain (www.esphealth.org).

Clinical Trials to Prevent Healthcare-Associated Infection

TIDE investigators have led clinical trials to prevent healthcare-associated infections for decades. These have included studies of perioperative antibiotic prophylaxis to prevent surgical site infections, novel urinary catheters to prevent urinary tract infections, computerized order entry systems to improve antibiotic use and tests of early weaning protocols for patients receiving mechanical ventilation. During the past several years, we have partnered with Hospital Corporation of America to conduct very large-scale cluster randomized trials. The REDUCE MRSA trial tested the utility of universal decolonization of ICU patients by randomizing over 74,000 patients in 43 hospitals within 18 months. The results, showing a dramatic reduction in infection rates, were an important driver of a change in routine practice in the U.S. Additional large-scale trials underway include assessing methods to improve the use of empiric antibiotic therapy to accelerate the detection and response to clusters of infections in hospitals, and identifying best regimens for decolonization.

Current TIDE faculty, staff, and trainees

"Medical practices, hospital systems, and health plans are natural partners to public health agencies in assessing, protecting, and improving the health of populations. We work with delivery systems and the public health community to develop and use capabilities that enhance these partnerships."

Richard Platt, MD, MSc, Chair, DPM; Director, TIDE

The Biostatistics Center

Founded in 2011 by Ken Kleinman, ScD, MSc, and currently led by Director Rui Wang, PhD, the Biostatistics Center is the home for statistical consultation and research in the Department. Our statistician faculty collaborate with multidisciplinary teams of clinicians, epidemiologists, project managers and analysts, **providing expertise in how to improve the reliability of evidence obtained from data, as well as advising on best practices and methods for extracting reliable information.** Our faculty are recognized internationally in a variety of areas including spatio-temporal surveillance, cluster-randomized trials, missing data methods and applications of software. Faculty interests also span causal inference, interrupted time-series models and longitudinal data.

Highlights include:

- The development of seminal methods for prospective surveillance to detect increased risks of vaccine-associated adverse events. These methods continue to be central to the vaccine safety work of both the CDC Vaccine Safety Datalink (VSD) and FDA Sentinel.

- The development of methods for detecting unusual clusters in space and time to establish automated surveillance of as-yet-undiagnosed syndromes of illness. These methods have since been applied to microbiology lab data on hospital infections in Boston and across the U.S. This method provides a more objective way of determining whether unusual clusters of illness are occurring than visual inspection by hospital infection control and public health epidemiologists.

Centers of Excellence

We're also home to two Centers of Excellence in Cancer Policy and Program Evaluation and Precision Medicine. These centers' primary purpose is to foster intellectual collaboration among DPM faculty across Divisions that have shared research interests, and to promote the expertise of these individuals to the outside world.

Center for Cancer Policy and Program Evaluation (CarPE)

The Center for Cancer Policy and Program Evaluation (CarPE) **conducts collaborative research on cancer control in the U.S. and international health systems.** To do so, CarPE faculty are building on a long-standing history of cancer-focused research in the Department, expertise with large databases and sophisticated research methods, and DPM research partnerships with care delivery and financing organizations.

CarPE
Center for Cancer Policy and Program Evaluation

PRecisiOn Medicine Translational Research (PROMoTeR) Center

The PRecisiOn Medicine Translational Research (PROMoTeR) Center **works to improve individual and population health outcomes by advancing precision medicine research and integrating use of genomic information into clinical care.** Precision medicine is an approach for disease treatment and prevention that takes into account individual variability in genes, environment and lifestyle for each person, such as discoveries that allow the tailoring of treatments based on specific characteristics of individuals including a person's genetic makeup.

PROMoTeR
PRecisiOn Medicine Translational Research Center

Looking ahead

One way to predict where we're going is to reflect on where we've been. From our beginning a quarter century ago, we've consistently focused on achieving and surpassing milestones, while keeping an eye on a rapidly-evolving roadmap for the future.

Since the Department's inception, our formula for success has been to appreciate, nurture, and build on the diverse strengths and passions of our faculty and staff. We've also benefitted immensely from a strong network of trusted collaborators to expand our reach and expertise. If one measure of success is the company we've kept through the years, we've far exceeded expectations. Over the next 25 years, the details of our journey are uncertain: we don't know whether our current areas of research focus will continue, whether we will remain at Landmark, or whether we'll even still be called the Department of Population Medicine. What is certain is that we will retain our strong ties to each other as well as the intellectual rigor and optimistic spirit with which we tackle the population health challenges of the day.

We hope you've enjoyed learning about our journey, and we now invite you on a stroll down memory lane, via our timeline. This collection of pivotal moments serves as a living document, evidence of our significant work and its impact on health improvement, which reaches far and wide. Thank you for your contributions and we look forward to a bright future.

Here's to the next 25 years!

Timeline

1992

HCHP and HMS create and jointly fund the Department with a teaching and research mission, housed in 3,000 square feet at 126 Brookline Avenue; Thomas S. Inui is appointed as the first Chair of the Department; Richard Platt is appointed as Associate Chair.

1993

The Drug Policy Research Group (DPRG) joins the new Department. DPM faculty members publish the INRUD-WHO manual *How to Investigate Drug Use in Health Facilities*.

1994

The Department receives its first federal award, a pharmacoepidemiology cooperative agreement from the FDA, which served as a foundation for future work in this field.

1996

The first Thomas O. Pyle Fellowship is awarded to Maureen Connelly.

The first Robert H. Ebert Fellowship is awarded to Anita Feins.

1998

The National Institute of Child Health and Human Development funds the Effects of Prenatal Diet on Mother and Child study, later named Project Viva, a still active longitudinal research study of mothers and children. See pg 11 for details.

1999

DPM faculty lead the Reducing Antimicrobial Resistance for Children study (ReACH), a cluster randomized trial involving providers and health plan members in 16 Massachusetts towns and cities. This was a collaboration with the Massachusetts Department of Public Health and all major payors.

The CDC designates the DPM as one of four national Prevention Epicenters, the cornerstone of its national program of research in prevention of healthcare associated infections. This center has been continuously funded since the program's inception.

2000

Thomas S. Inui departs after serving eight years as Chair; Richard Platt is appointed the interim Department Chair.

The Department joins the CDC Vaccine Safety Datalink (VSD), to monitor the safety of vaccines. The DPM continues active participation through the present.

The DPM leads the creation of the AHRQ HMO Research Network CERT (Center for Education and Research on Therapeutics), beginning a strong collaboration with what is now the Health Care Systems Research Network.

2001

The DPM research funding portfolio exceeds $10 million.

The HMS Fellowship Program in Pharmaceutical Policy Research (now known as Fellowship in Health Policy and Insurance Research) is founded.

2003

Richard Platt is appointed Chair of the Department.

The Center for Child Health Care Studies is founded to conduct pediatric health services research; Tracy Lieu is the Founding Director with Jonathan Finkelstein as Associate Director.

2004

DPM faculty conduct the first study to demonstrate that blunt-edged regulation can lead to racial disparities; the study focused on monitoring of physicians' prescribing of benzodiazepines and was one basis for inclusion of coverage of benzodiazepines in Medicare Part D.

2005

The DPM is designated a CDC Public Health Informatics Center of Excellence, in partnership with the Massachusetts Department of Public Health and Boston Children's Hospital. This program created ESP (Electronic health record Support for Public health) and MDPHnet, which now provides automated surveillance for infectious and chronic disease covering over a quarter of the Massachusetts population.

The DPM leads the creation of the AHRQ HMO Research Network DEcIDE (Developing Evidence to Inform Decisions on Effectiveness) network, expanding the Department's leadership of multi-center studies of comparative effectiveness.

2006

The NIH-funded Study of Pneumococcal Antibiotic Resistance in Communities study is awarded to the DPM to conduct longitudinal analysis of pneumococcal carriage, antibiotic resistance, and invasive disease in a stable geographic population of children over the next decade.

The Obesity Prevention Program (OPP) is created. The founding Director is Matthew Gillman with Elsie Taveras as co-Director.

2007

The DPM research funding portfolio exceeds $20 million.

DPM faculty and colleagues found the Medicines and Insurance Coverage (MedIC) Initiative, leading international research and teaching collaborations to inform pharmaceutical policy in low- and middle-income countries.

DPM faculty lead the first quasi-experimental study of HDHPs, demonstrating that low-severity but not high-severity emergency department visits decreased among members switched to HDHPs.

The NIH funds Breastfeeding Promotion RCT and Child Cetabolic Syndrome, based on the long-term follow-up of 17,046 healthy mothers and infants enrolled into the Promotion of Breastfeeding Intervention Trial (PROBIT) in the Republic of Belarus, the largest cluster-randomized controlled trial in the area of human lactation. See pg 12 for details.

The Pharmacoepidemiology group changes its name to TIDE (Therapeutics Research and Infectious Disease Epidemiology) to reflect a growing portfolio.

2008

DPM faculty publish several studies on HDHPs. Study findings showed HDHP members substituted a low-cost colorectal cancer screening test for the more expensive screening colonoscopy and exempting preventive services from deductibles in HDHPs preserves their use, a feature that would become part of the 2010 Affordable Care Act provisions.

2009

The DACP becomes the Department of Population Medicine (DPM) housed in the newly created Harvard Pilgrim Health Care Institute.

The DPM research funding portfolio exceeds $30 million.

The AHRQ-funded Preventing Avoidable Infectious Complications by Adjusting Payment study is awarded and funded continuously for the next decade. This study in >650 hospitals demonstrated that financial penalties focused on billing data had no demonstrable impact on actual health outcomes.

DPM faculty design, build, and release PopMedNet, public domain software that enables privacy protecting distributed research networks. This program enables a large number of networks, including the FDA Sentinel System, PCORnet, and the NIH Collaboratory Distributed Research Network.

The DPM leads the FDA Sentinel Initiative (originally Mini-Sentinel), a national electronic surveillance collaborative involving most of the nation's large private insurers and health plans to monitor the safety of marketed medical products. Sentinel has established the largest operational distributed data network with highly curated, analysis-ready data, now accounting for over 400 million years of person time.

2010

The DPM research funding portfolio exceeds $40 million.

The White House Task Force on Childhood Obesity Report to the President cites DPM research.

2011

The Massachusetts Department of Public Health funds MDPHnet as a core public health surveillance activity, for notifiable diseases and chronic disease surveillance.

2012

DPM faculty play an integral role in the USDA and HHS B-24 project, providing nutrition and food-based recommendations that are focused on health promotion and disease prevention for individuals, and the relationship between early child nutrition and health outcomes throughout the lifespan.

Tracy Lieu departs the DPM; Grace Lee becomes Director of the Center for Healthcare Research in Pediatrics (CHeRP) after a rebranding, with Alison Galbraith as Associate Director.

2013

The AHRQ and CDC funded REDUCE MRSA study performed with Hospital Corporation of America (HCA) demonstrated that universal decolonization of ICU patients reduced infection rates. This practice has subsequently been adopted by a majority of U.S. hospitals.

The CDC revises its national surveillance definition of ventilator associated pneumonia, based on research led by DPM investigators.

The AHRQ-funded Defining and Preventing Ventilator-Associated Complications in Pediatrics study is awarded to establish a pediatric VAE definition suitable for use in neonates and children, leading to use of this new definition in >100 children's hospitals in 2016 and expanded to the CDC's National Healthcare Safety Network for all U.S. hospitals beginning in January 2019.

2014

DPM research demonstrates that driven decrease in antidepressant use among adolescents, because of concern that the drugs increase suicide risk, was followed by increases in suicide attempts.

2015

The DPM and the Hospital Corporation of America create a new research partnership to evaluate and test high impact interventions to improve care, and to support public health.

DPM faculty report that introduction of tamper-resistant long-acting oxycodone was associated with a large reduction in long-acting oxycodone prescribing. Additionally, they noted that high rates of opioid prescribing continued even after opioid overdoses.

The OPP launches the Weighing in Blog.

2016

The DPM moves to its new location in Boston's historic Landmark Center.

The DPM creates two new Centers of Excellence in Precision Medicine (led by Ann Wu) and Cancer (led by Anita Wagner and Natasha Stout).

Matthew Gillman leaves OPP; Emily Oken is appointed Vice-Chair of the Department of Population Medicine and Director of the Division of Chronic Disease Research Across the Lifecourse (CoRAL), formerly OPP, with Jason Block as Associate Director.

Stephen Soumerai steps down as Director of the Drug Policy Research Group; Frank Wharam assumes the directorship.

2017

The DPRG becomes the Division of Health Policy and Insurance (HPI) Research.

The DPM launches the Robert H. Ebert Career Development Awards in memory of Robert H. Ebert, former dean of Harvard Medical School, founder of Harvard Community Health Plan, and the first Chair of the Board of Directors of the Harvard Pilgrim Health Care Foundation.

DPM faculty publish the first study demonstrating that High Deductible Health Plans are associated with adverse health outcomes, finding that low-income diabetes patients delayed visits for diabetes care and experienced higher rates of emergency department visits for complications.

The DPM, University of California Irvine, and HCA investigators complete the ABATE trial of universal decolonization in non-ICU settings (53 hospitals; 340,000 admissions), and begin three cluster randomized trials:

- CLUSTER to assess the utility of early detection of outbreaks in hospitals (80 hospitals; 3.4 million admissions),
- SwapOut to test the utility of iodophor in place of mupirocin for universal decolonization (137 hospitals; 695,000 ICU admissions), and
- INSPIRE to test a point of care intervention to improve antibiotic prescribing in emergency Departments (64 hospitals, 200,000 admissions).

Department of Population Medicine
Harvard Pilgrim Health Care Institute
Landmark Center
401 Park Drive, Suite 401 East
Boston MA, 02215
www.populationmedicine.org