EXPERIENCE REPORT

Learning Health Systems

Training the next generation of delivery science researchers: 10-year experience of a post-doctoral research fellowship program within an integrated care system

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Abstract

Introduction: Learning health systems require a workforce of researchers trained in the methods of identifying and overcoming barriers to effective, evidence-based care. Most existing postdoctoral training programs, such as NIH-funded postdoctoral T32 awards, support basic and epidemiological science with very limited focus on rigorous delivery science methods for improving care. In this report, we present the 10-year experience of developing and implementing a Delivery Science postdoctoral fellowship embedded within an integrated health care delivery system.

Methods: In 2012, the Kaiser Permanente Northern California Division of Research designed and implemented a 2-year postdoctoral Delivery Science Fellowship research training program to foster research expertise in identifying and addressing barriers to evidence-based care within health care delivery systems.

Results: Since 2014, 20 fellows have completed the program. Ten fellows had PhD-level scientific training, and 10 fellows had clinical doctorates (eg, MD, RN/PhD, PharmD). Fellowship alumni have graduated to faculty research positions at academic institutions (9), and research or clinical organizations (4). Seven alumni now hold positions in Kaiser Permanente's clinical operations or medical group (7).

Conclusions: This delivery science fellowship program has succeeded in training graduates to address delivery science problems from both research and operational perspectives. In the next 10 years, additional goals of the program will be to expand its reach (eg, by developing joint research training models in collaboration with clinical fellowships) and strengthen mechanisms to support transition from fellowship to the workforce, especially for researchers from underrepresented groups.

KEYWORDS
delivery science, learning health system, postdoctoral training, research fellowship

1 | INTRODUCTION

Delivery science can be defined as the science of identifying and overcoming barriers to effective health care at the patient, provider, clinical practice, and health care system levels. Key elements of this research domain include working directly within active health care settings, aligning with stakeholder goals, collaborating across research and operational disciplines, and implementing pragmatic study designs (both observational and interventional) that account for the unique challenges of conducting research within the constraints of health care delivery systems.

The field of delivery science has grown out of the recognition that evidence from basic and clinical research has been slow to translate into better health care for most people with or at risk for chronic disease.[1] Despite decades of research highlighting gaps in the quality of health care, research efforts to directly address those gaps are lagging, resulting in most individuals not experiencing optimal health care.[2,3] The term "second translational block" was coined over 20 years ago to describe this gap between clinical evidence and clinical practice.[4] Policy makers and other health care stakeholders have recognized that the research enterprise—as supported both by traditional funders such as NIH as well as nontraditional sources such as Learning Health Systems (LHS) - must expand its efforts to support research that directly improves delivery of health care.[5] Key to making progress bridging the gap between evidence and translation is training a research workforce educated in delivery science to support operational leaders within effective learning health systems.[6-10] However, most traditional fellowship programs either focus on individual physician training (eg, clinical fellowships), or on basic and epidemiologic science methodology (eg, NIH-funded T32s). To our knowledge, few postdoctoral training programs focus explicitly on delivery science methodology and developing the next generation of delivery science researchers and quality improvement leaders.

Following the example of reports on other innovative fellowship programs,[7,9,11-15] this paper is designed to assist leaders in academic medicine and in health care systems who have recently developed, or are considering initiating, efforts to train physicians and researchers in the emerging field of delivery science. Efforts to increase postdoctoral research training in implementation methods,[10,16] health system science,[17] and delivery science are increasing, including programs facilitated by AcademyHealth and others supported by K12 grants from the Agency for Health Care Research and Quality. However, most delivery science fellowship programs have only been initiated within the past decade, and little systematic knowledge exists about how to optimize the success of delivery science training.

In this report, we describe the 10-year experience of a postdoctoral research training fellowship program embedded within the research division of an integrated care delivery system. The program we describe has longer experience than most and is relatively unique in being embedded in a large delivery system and sponsored by its medical group. We focus on the process of implementing this fellowship program, share insights into challenges and successes of sustaining the program, and consider next steps for this area of research training.

2 | IMPLEMENTING A DELIVERY SCIENCE FELLOWSHIP WITHIN A LEARNING HEALTH SYSTEM

The Delivery Science Fellowship (DSF) program was initiated in 2012 within the Kaiser Permanente Northern California (KPNC) Division of Research. KPNC is an integrated health care delivery system serving 4.5 million members in Northern California. The Division of Research (DOR) is a long-standing research department homed within KPNC with more than 60 faculty-level researchers, including physicians and doctoral scientists, who are primarily funded by external research grants. The DSF program is funded and fostered by The Permanente Medical Group (TPMG), which is the largest medical group in the nation and contracts exclusively with Kaiser Foundation Health Plan to provide care for KPNC members. The relationship between the Fellowship program and the different elements of the health system is depicted in Figure 1. This program to train early-stage investigators in delivery science was funded as part of a broader portfolio of new programs designed to increase links between research and operational decision-making within the institution.[18]

TPMG committed to funding this program in the process of recruiting a new director for DOR in 2012. The impetus was to catalyze interest in delivery science among existing researchers and operations leaders, as well as to expand workforce capacity in this field. The program's success is measured by (1) the productivity of fellows in completing projects that produce findings leading to publication and contributing to clinical and operational change (evidence of successful fellowship training); (2) the ability of the program to draw together researchers, clinicians, and operations leaders into collaboration via fellows (evidence of establishing a successful delivery science interdisciplinary collaboration model); and, (3) the program's contributions to helping other systems build infrastructure for delivery science research training.

The program was initiated with two annual 2-year fellowship positions. In 2016, a third fellowship position was added to focus on applied clinical informatics in recognition of the increasingly important role of data science and the advances in clinical prediction modeling methods within care delivery systems. Fellows accepted into this DSF/Informatics track gain advanced skills in developing clinical prediction models and in barriers and facilitators to their clinical implementation.[19,20]

3 | STRUCTURE OF THE FELLOWSHIP PROGRAM

The postdoctoral fellowship program was designed to support a robust training and apprenticeship experience for junior investigators seeking careers at the intersection of translational research with health care delivery redesign and quality improvement. The program is comprised of four core components:

1. Structured training: The fellowship shares many of the main features of more traditional 2-year fellowship training programs, including weekly Works-in-Progress meetings and a weekly Core Competency Curriculum. The curriculum is specifically designed to

FIGURE 1 Organization chart depicting how the Delivery Science Fellowship is homed within the Division of Research (DOR), an independent research division that reports to one of 6 Associate Executive Directors of The Permanente Medical Group (TPMG). TPMG coordinates with the Kaiser Foundation Health Plan and Kaiser Foundation Hospitals to create the Kaiser Permanente Northern California (KPNC) integrated health care delivery system. Many of the research physicians based in DOR also provide care in KPNC.
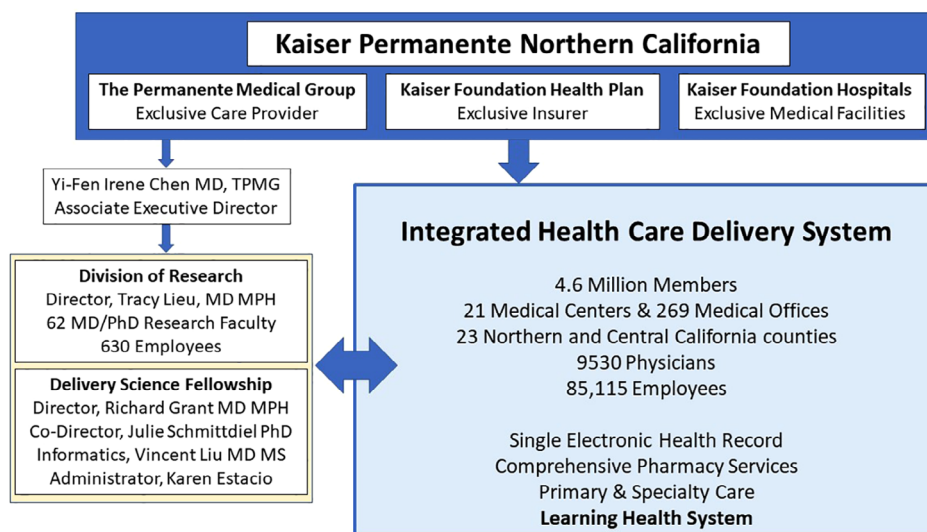

Kaiser Permanente Northern California

| The Permanente Medical Group Exclusive Care Provider | Kaiser Foundation Health Plan Exclusive Insurer | Kaiser Foundation Hospitals Exclusive Medical Facilities |

Yi-Fen Irene Chen MD, TPMG
Associate Executive Director

Division of Research
Director, Tracy Lieu, MD MPH
62 MD/PhD Research Faculty
630 Employees

Delivery Science Fellowship
Director, Richard Grant MD MPH
Co-Director, Julie Schmittdiel PhD
Informatics, Vincent Liu MD MS
Administrator, Karen Estacio

Integrated Health Care Delivery System

4.6 Million Members
21 Medical Centers & 269 Medical Offices
23 Northern and Central California counties
9530 Physicians
85,115 Employees

Single Electronic Health Record
Comprehensive Pharmacy Services
Primary & Specialty Care
Learning Health System

TABLE 1 Topics covered in delivery science core curriculum.

Domain	Seminars
Health systems	Defining Delivery Science Introduction to KPNC Health Care Delivery System Introduction to Big Data Informatics Principles of Collaboration Stakeholder Engagement Social Determinants of Health
Methods	Algorithmic Bias in Prediction Models Building a Conceptual Model Community Based Participatory Research Causal Methods for Observational Data Dissemination & Implementation Research Pragmatic Clinical Trial Designs
Career	Defining a Delivery Science Research Question How to Give a Job Talk Developing your Research Brand Inclusive Writing Introduction to Grant Writing Poster Presentations Thought Pieces and Editorials

TABLE 2 Delivery science questions.

While individual research projects (particularly those conducted by early-stage investigators) are generally incremental in nature, delivery science considered more generally is positioned to address broad care-related questions, such as:

- What system, provider, and patient-level factors prevent the effective delivery of evidence-based care? And how can these factors be addressed to improve patient-centered care?
- How should health systems effectively screen for and address socially determined barriers to health care?
- What strategies can be developed and implemented to reduce disparities in health care outcomes by race/ethnicity and other risk factors?
- How can advanced predictive modeling strategies be developed and effectively implemented to improve care (eg, cancer screening and treatment, cardiovascular risk stratification, emergency department triage)?
- What strategies can be developed and implemented to address prevalent and challenging problems such as obesity, medication non-adherence, and complex co-morbidity?

augment traditional research training with a focus on topics that are directly relevant to delivery science and are often not part of traditional research training curricula (Table 1).[21] Additional didactic components of the program include monthly Delivery Science Seminars by more senior investigators focused on delivery science-related research and the option for scholars to take specific coursework (eg, advanced modeling techniques, qualitative methods) online or at local academic institutions.

2. Research: The fellowship experience is an apprenticeship model that introduces the fellow to the details of research within a care delivery system. Table 2 presents a framework of scientific questions that can be addressed through the lens of delivery science. Program leaders work with Research Mentors to set expectations prior to the new fellow's arrival. The specifics of the activities recommended for each fellow are tailored according to their level of prior training. Activities include having "ready-to-go" data

(so that the fellow can begin immediately working towards a scientific abstract submission within the first 6 months), inviting fellows to participate in standing research meetings, and introducing fellows to clinical and operational stakeholder collaborators. Examples of how fellows developed research paths during fellowship are given in Table 3.

3. Scientific and Career Mentoring: The program implemented a dual mentorship structure where each fellow is linked to a Research Mentor (or Mentor pairs combining a senior and junior mentor) and a career mentor. Fellows work closely with their research mentors to conduct research aligned with the mentor's portfolio, while having the added benefit of the perspective of the career mentor independent of the research program conducted by the research mentor.

4. Career development: All fellows complete a career development plan (CDP), a 2-page structured report on research, learning, and career goals within the first 3 months of arrival, and update it

TABLE 3 Four program alumni case vignettes.

Cassondra Marshall PhD (second graduating cohort): Dr. Marshall's interest during her doctoral training was in doctor-patient communication regarding contraceptive choices. Improving women's health has been identified by the medical leadership and an important priority. During her first year of fellowship, she worked with her primary scientific mentor on a project to examine contraception adherence by co-payment costs. As she developed relationships with different investigators and clinical leaders over the course of her training, she expanded her women's health research portfolio to investigate care decisions for women of reproductive age with diabetes.[25,40] This work was funded in part by an internal award for early-stage investigators. Dr. Marshall completed a third post-doctoral training year before accepting a position as an Assistant Professor in the Maternal, Child and Adolescent Health Program at UC Berkeley School of Public Health. She went on to be awarded an NIH Career Development Award and continues to build an academic research career focused on health system strategies to promote women's health over the life course, with a particular focus on women of reproductive age.

Jonathan Weiner MD MPH (fourth cohort): Dr. Weiner joined the program after completing Internal Medicine residency training at Massachusetts General Hospital. Building on his clinical interest in geriatric medicine, Dr. Weiner engaged with clinical stakeholders to frame a research question regarding safe medication de-prescribing in older adults with type 2 diabetes, an understudied question highly relevant to the care delivery system leadership. With his research mentor and team, Dr. Weiner defined and studied a KP cohort of older adults with type 2 diabetes to examine prescribing and de-prescribing patterns over time. This work was funded in part by an internal award for early-stage investigators. The finding that de-prescribing was infrequent and older adults with the most comorbid illness were overtreated helped inform the development of new treatment guidelines.[31,41] Immediately after graduation, Dr. Weiner joined the medical group (TPMG) and worked as the KPNC Life Care Planning Physician Lead. He subsequently pursued further clinical training as a Hospice and Palliative Medicine Fellow at University of Minnesota Medical School. Dr. Weiner is currently a Physician Lifespark, at a healthcare start-up providing home-based care to medically and socially complex older adults.

Halley Ruppel RN PhD (fifth cohort): Dr. Ruppel's doctoral research focused on alarm fatigue within acute care settings with an overall career focus on improving patient outcomes by optimizing the use of technology and data in acute care. She joined the fellowship as a DSF/Informatics fellow to apply machine learning methods, working closely with clinical leaders and her research mentors in obstetrical risk prediction and in understanding electronic health record search patterns.[33,42] This work was funded in part by a K12 Building Interdisciplinary Research Careers in Women's Health award jointly sponsored by UCSF and KP Northern California. Her research helped inform the design of an early warning score in Labor & Delivery which is currently in pilot testing. After program completion, she was recruited to join the faculty at University of Pennsylvania as a Research Assistant Professor with a co-appointment at the Center for Pediatric Clinical Effectiveness within the Children's Hospital of Philadelphia Research Institute to continue her focus on clinician use of complex data and novel technology.

Sidney Le, MD (seventh Cohort): Dr. Le joined the fellowship as a DSF/Informatics fellow during the 2-year research portion of his UCSF-East Bay General Surgery residency. His goals during his fellowship were to extend his training in surgical health services research and to gain experience in applying artificial intelligence/machine learning tools in surgical risk stratification. This domain of predictive modeling to improve surgical care processes and outcomes was identified as a high priority by health system leadership. Dr. Le worked closely with clinical leaders overseeing perioperative surgical care programs and with research mentors to develop and deploy several tools to improve pre-surgical care in a large, integrated health system. The tools he contributed to have been rapidly implemented into clinical practice resulting in substantial improvements in the approach to perioperative clinical evaluation and to surgical scheduling during the COVID pandemic.[19,43] In addition, he gained firsthand experience with Artificial Intelligence and Machine Learning tools, including computer vision, applied to pre-surgical EHR and imaging data. After program completion, he returned to complete his General Surgery residency with a long-term goal to use complex, multimodal data to improve surgical processes and outcomes.

every 6 months until graduation.[22] With each update of the plan, the fellow and mentors meet in-person to discuss progress, identify plans for the next 6-month period, and plan for transition to the next career step. In addition, all fellows and Research Mentors sign a mentorship agreement that explicitly defines expectations of both mentee and mentor (eg, meeting cadence, agenda setting responsibility, and expected turn-around times for reviewing manuscripts).

Compared to more traditional research training programs, unique aspects of the delivery science research training experience include: the expectation that fellows focus their studies primarily on topics that have a direct operational impact; the opportunity for fellows to collaborate on teams that include clinical and operational leaders; and the potential for innovative applied uses of the system's electronic health record data (eg, predictive analytics). The fellowship also places high emphasis on ongoing interactions with clinical and operational collaborators and on the dissemination of results to internal constituents (in addition to peer-reviewed publications).

An important structural focus of the program has been to build a peer-to-peer support network within the fellowship cohort.[23] Proactive strategies to establish this network include the following: (1) "Quick hits"—roundtable at the weekly WIP sessions where each fellow is encouraged to report on recent career or personal news, (2) "Faculty speak last"—initial comments and suggestions for a given WIP presentation are led by co-fellows, and (3) Fellow-organized quarterly lunch or happy hour meetings. An additional focus has been for the fellowship to serve as a magnet to interest our research faculty in participating in delivery science and to draw epidemiologists and health services researchers into research collaborations.

4 | CHALLENGES AND FACILITATORS TO PROGRAM IMPLEMENTATION

Table 4 provides a summary of barriers and facilitators to program implementation within each of six domains (Recruitment, Selection, Onboarding, Fellowship Activities, Research Apprenticeship, Graduation).

TABLE 4 Challenges and facilitators to implementing a new delivery science fellowship program.

Domain	Strategy	Challenges	Facilitators
Recruitment	Direct emails to residency and doctoral program leaders; Posting in listservs and national research meetings; Alumni; Personal connections	Unopened emails; lack of familiarity with delivery science or with KPNC Division of Research; concerns about career viability	Direct recruitment by alumni; Repeated outreach to program leaders; Presentations by DSF program directors at national meetings
Selection	Explicit criteria (candidate track record, fit with mentor, commitment to delivery science); Telephone pre-screening; Formal admissions committee	Heterogeneous mix of candidate backgrounds (eg, level of clinical training, prior research experiences)	Application includes personal statement & writing sample; Admission interviews include potential scientific mentors
Onboarding	Onboarding packet; New fellow introductions during department meetings; Discuss career development plan during first month	Fellows need to balance completing prior work (eg, thesis papers) vs getting started with KPNC data	Explicit expectations: (1) Mentor to have initial data ready; (2) Fellow to have an abstract for submission within first 6 months
Fellowship activities	Weekly Works-in-Progress; Journal Club, and Core Competency Curriculum	Fellowship directors have limited contact with fellows each week ("Teaching Tuesdays")	Build peer-to-peer connections; Encourage social outings; Request Program Feedback
Research apprenticeship	Identify primary research mentor during selection process; train mentors; set expectation for research abstract within 6 months	Apprenticeship model highly dependent on fellow and scientific mentor	Formal career development planning every 6 months with fellow, research and career mentor(s)
Graduation	Work with fellows to be able to articulate a career path and rationale for getting hired	Wide variety of potential post-fellowship career options requires wider breadth of knowledge for career advising	"Job Talk" preparation including DOR seminar; Informational meetings with KPNC leaders; Connections with leaders beyond research settings

Recruiting applicants to a research training setting beyond traditional university settings requires continued and active networking with leaders of predoctoral training and residency programs across the country. This active outreach often includes brief informational interviews with directors and with potential applicants to explain the goals and benefits of delivery science training. Outreach and networking were conducted primarily by the fellowship leadership and administrator (Figure 1).

Three factors are assessed in the selection process: (1) strength of the candidate (training, publications), (2) fit with a specific scientific mentor (to optimize the research experience), and (3) commitment to delivery science. The DSF recruitment strategy also seeks candidates from a range of doctoral training backgrounds (ie, PhD, MD, PharmD, RN PhD, RD PhD). This heterogeneity in training imbues the fellowship cohort with varied expertise in methodology and in clinical experience that is advantageous for peer-to-peer learning and that provides a model for cross-disciplinary collaboration (a key skill for delivery science).

A successful start to the fellowship for new candidates requires setting the expectation that the scientific mentors be prepared with projects for incoming fellows. In parallel, new fellows are expected to have an abstract ready within the first 6 months for submission to a national research or quality meeting. Primary mentors for delivery science fellows are drawn from a wide range of researchers within DOR. Some are health services researchers, while others are epidemiologists. They span a range of specialty areas, including behavioral and mental health, cancer, cardiovascular disease, diabetes and other chronic conditions, infectious diseases, and women's and children's health. Although mentors are not financially supported by the fellowship program, working with fellows helps expand the mentor's portfolio of research and helps the mentor build collaborative ties with clinical and health system stakeholders.

Early in the second year of fellowship, there is an increased focus on transition to the next stage of the fellow's career. Fellows practice job talks, conduct informational interviews, and present a seminar to the DOR faculty. Delivery science training provides a wide range of potential career steps. This diversity of pathways requires that career mentors be adept at understanding and advising on multiple different types of job opportunities. The program continues to provide career support after graduation by inviting interested alumni to return to give a scientific seminar to the division faculty.

5 | RESULTS

In the first 8 years of accepted fellows, there were an average of 24.6 (±8.8) applicants per year, of whom 10.5 (±2.5) applicants per year were invited for formal interviews with the admissions committee and potential scientific mentors. Among the interviewed applicants, fellowship positions were offered to 26 candidates (34.2%), of whom 22 (84.6%) accepted and enrolled into the fellowship program. These fellows were mentored by 14 different DOR Research Mentors with

expertise in the clinical domains of women's health, cancer, diabetes, health disparities, cardiovascular disease, and behavioral health.

Fellow productivity was assessed by abstract acceptances and manuscript publication. All fellows presented abstracts at annual national research meetings (eg, AcademyHealth, American Diabetes Association, Society of General Internal Medicine), and many first-authored fellows' papers were published in leading journals.[19,24-36] Four case examples are presented in Table 3 to illustrate typical barriers and facilitators to successful research faced by fellows during training.

Among the first 20 graduates of the program, 9 obtained faculty research positions at academic institutions (including 2 who were recruited to join the research faculty at the DOR). The next largest group of graduates (7) remained within KPNC as clinicians with expertise in quality improvement or as employees within organizational management. Both PharmD fellows joined operational settings in the pharmacy industry, and 2 of the MD fellows continued on with further training (PhD and surgical residency programs).

Key lessons learned over the first 10 years of this program led to several modifications to strengthen the program. First, recruitment efforts in the program's early years (through job postings and email outreach) led to a heterogeneous mix of often sub-optimal applications. In later years, program directors took an increasingly active outreach role including scheduling 1:1 informational interviews with doctoral program leaders and potential applicants. Second, given the critical role of scientific mentorship in a successful fellowship experience, over time we implemented a more formal process of bi-annual meetings with potential scientific mentors to describe our mentoring framework and to ensure enthusiastic engagement with program goals and processes. Third, although not unique to delivery science training, many fellows reported that the 2-year experience seemed pass very quickly, underscoring the importance of weekly check-ins during WIP sessions combined with quarterly Career Development Plan reviews.

6 | DISCUSSION AND NEXT STEPS

Bridging the gap between clinical evidence and clinical practice will continue to be a paramount need in US health care. While many factors contribute to gaps between ideal and actual health outcomes and to health disparities, a research focus on how health systems organize and deliver care holds promise as a key strategy for reducing this gap and improving our nation's health. Given the many unique skills required for delivery science, specialized postdoctoral research training programs such as the program described in this report represent a critical opportunity to broaden the scope of our nation's research workforce.

With over a decade of experience, the DSF program provides a framework and insights to guide national efforts to train early investigators in translating evidence into practice within health care systems. Keys to initiating the program included strong institutional support, a cadre of experienced research mentors, and existing collaborative

networks of researchers with clinical and operational stakeholders. Sustaining this success has required: (1) Building a national reputation through national research meeting presentations to attract high quality applicants and to influence the national discussion about delivery science training, learning health systems, and external funding ("External Perspective"), and (2) Building an internal reputation through active collaboration with clinicians and operational leaders to continue identifying research questions of high priority to the care delivery system and to solidify ongoing support by the sponsoring medical group ("Internal Perspective").

Many program graduates are pursuing clinical translational research in academic settings. Those who have pursued this traditional research pathway likely had long-term intentions to develop an R01-funded research career at the intersection of clinical and delivery science. The second most common pathway to post-graduation success has been to join a health care delivery system in a clinical or operational capacity. These two postfellowship outcomes reflect the program's strategy of enrolling high-quality candidates from both research-oriented and clinically-oriented doctoral training programs. Regardless of career path, the most successful fellows were able to adapt to the complex environment of an active health care delivery system, taking full advantage of available opportunities to actively pursue research questions of highest priority to clinical and health system leadership stakeholders.

The inherent complexity of conducting science within health systems can pose special challenges to creating learning opportunities for fellows. A key insight into framing delivery science research questions is that the research needs to be driven by existing problems that are of high priority to clinical and health system leadership. Somewhat paradoxically, in delivery science research the more operationally important the problems are, the less time and freedom researchers tend to have to address them before operational teams implement changes. Successful mentorship in this setting requires actively helping fellows navigate these challenges by helping to balance short-term efforts that are responsive to immediate operational needs (and in doing so, help build collaborative relationships) with longer-term efforts that can include rigorous study design and analyses for publication (and that can support future academic funding).

Implementing a new delivery science training program requires substantial pre-existing research infrastructure (eg, faculty willing to mentor, clinical leaders open to collaboration, data analysis capacity) and funding to support fellow's salaries. Strategies for smaller organizations may include creating a joint network to fund 1–2 fellows or partnering with existing national organizations such as Academy-Health. Given the potential benefit to the nation's health of increasing the delivery science workforce, we also recommend that NIH, AHRQ, and other major funders expand their investments in similar training programs.

The infrastructure and training framework developed for this fellowship has also served as a scaffolding to support new training programs, including NIH-funded T32 programs (T32DK116684, T32MH125792). Future efforts will focus on developing hybrid research training models that involve collaborations with academic clinical fellowship training programs or with nonclinical programs such

as user-centered design, bioinformatics, or pharmacoepidemiology programs. We will also seek to bolster the workforce pipeline of researchers from underrepresented groups by continuing active outreach to doctoral and clinical training programs that enroll higher proportions of underrepresented students.[37] The national effort to reduce barriers to effective care has increasingly recognized the role of socially-determined barriers to heath,[38] and thus researchers whose own lived experiences include experience with social determinants of health bring unique insights to guide innovation in care delivery.[39]

In the next 10 years, additional goals of this DSF program will be to expand its reach by developing joint research training models in collaboration with clinical fellowships and to strengthen mechanisms to support transition from fellowship to the workforce.

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CONFLICT OF INTEREST STATEMENT

The authors assert that they have no relevant conflicts of interest.

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