A National Leadership Incubator to Promote Equity in Diagnostic Excellence
The National Academy of Medicine DxEx Scholars
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In 2021, the National Academy of Medicine (NAM), Council for Medical Specialty Societies, and Gordon and Betty Moore Foundation collaborated to create the Scholars in Diagnostic Excellence (DxEx) program. This year-long program was designed to accelerate the development of leaders who focus on implementing strategies to raise awareness about diagnostic excellence in medicine and work on reducing errors at the national level. The program was explicitly focused on safety, quality, and equity in achieving diagnostic excellence. In this Viewpoint, we describe the structure of this novel program, discuss foundational cross-cutting concepts and themes generated from the scholarly work of the inaugural cohort, and share lessons learned from the development of this national leadership incubator.

Program Design
In contrast with many research-focused or disease-focused career-development funding mechanisms, such as the National Institutes of Health K awards, few cross-cutting, disease-agnostic funding models have specifically been designed for leadership development related to research and implementation on patient safety, quality, and equitable health care system improvement. The NAM DxEx Scholars program served as a leadership incubator focused on transforming the implementation of diagnostic excellence through the lens of health equity. The inaugural cohort included scholars from a wide variety of clinical specialties. Scholars met virtually to learn foundational topics related to diagnostic excellence, cognition and clinical reasoning, equity and inclusion, systems thinking, patient engagement, data science, and change management. Each scholar had an assigned project mentor with expertise relevant to their project and also formed topic-focused groups within the cohort to promote collaboration and peer mentorship. The program culminated with an in-person summit where scholars shared their scholarship and implementation and sought guidance to expand their reach beyond the fellowship.

The inaugural NAM DxEx scholars identified the following 5 foundational themes to improve the diagnostic process: (1) there is no diagnostic excellence without equity; (2) uncertainty is ubiquitous; (3) diagnostic safety frameworks are universally applicable; (4) data science and machine learning can be applied to the diagnostic journey; and (5) the diagnostic process must always be guided by the patient’s voice.

Theme 1: There Is No Diagnostic Excellence Without Equity
This leadership incubator equipped scholars to cross silos and tackle existing and emerging health care challenges with an explicit equity lens. The scholars' projects highlighted how equity is integral to diagnostic excellence and high-quality patient care, and they underscored how the COVID-19 pandemic exacerbated existing disparities and created new disparities related to telehealth access. One scholar leveraged community-based participatory research and mixed-methods research principles to engage the Latino and Hispanic community and deeply understand current and emerging barriers to lung cancer screening during the pandemic. Another scholar highlighted digital inclusion through health care infrastructure by examining how telehealth influences the diagnostic journey in patients with limited English proficiency presenting with abdominal pain.
Theme 2: Uncertainty Is Ubiquitous
Another cross-cutting theme that emerged was the ubiquity of diagnostic and management uncertainty and how clinicians should embrace it and explicitly discuss it with patients. One scholar's project embedded a diagnostic pause at the high-risk transition from intensive care units to other hospital units, highlighting how explicitly incorporating the discussion of uncertainty at transitions of care can prevent diagnostic errors due to anchoring bias. Another scholar explored the associations between clinicians' comfort with uncertainty, interpretation of diagnostic testing, and inappropriate antibiotic use. This study highlighted how clinicians' culture and attitudes, including the tendency to want to do more even when evidence is lacking, can potentially harm patients.

Theme 3: Diagnostic Safety Frameworks Are Universally Applicable
The scholars' work transcended the research context to demonstrate how actively implementing new approaches, frameworks, and data tools can support diagnostic improvement. One scholar focused on applying a diagnostic safety lens to maternal mortality reduction by systematically characterizing the nature of diagnostic safety events during simulated maternal hemorrhage events. Such standardized diagnostic safety frameworks can be adapted beyond obstetrics into other areas of health care to systematically improve diagnostic excellence across different clinical disciplines.

Theme 4: Data Science and Machine Learning Can Be Applied to the Diagnostic Journey
The rise of data science in health care provides another universally adaptable tool to tackle diagnostic delays and errors. One scholar applied network-based machine learning methods to discern common patterns of diagnostic delay and drove the discovery of underrecognized disease subtypes, thus improving early diagnosis. Another scholar showcased how pragmatic implementation of real-time pediatric intensive care unit data monitoring and predictive analytics can identify early patient deterioration. Finally, given the emerging role of data science in health care, one of the scholar's projects centered on developing a competency-based medical curriculum focused on using machine learning models to inform diagnostic decision-making.

Theme 5: The Diagnostic Process Must Always Actively Include the Patients' Views
All projects emphasized the importance of empowering patients and incorporating their perspectives in every step of the diagnostic journey. Rather than a passive role where patients have diagnoses explained to them, several projects showcased how intentional listening and incorporating the patients' views in the diagnostic process is critical to navigating the diagnostic journey. One scholar focused on optimally engaging racial and ethnic minority patients in the often prolonged diagnostic journeys of rare and underrecognized diseases. Another scholar engaged underrepresented patients to cocreate medical notes of their diagnostic journeys in order to overcome barriers to diagnostic safety.

Program Limitations
Although the NAM DxEx Scholars program helped catalyze the careers of a cohort of scholars, some notable limitations of the program were also identified. Although the formal NAM DxEx program spanned 1 year, many of the projects will continue to mature after the formal program has ended. The true sustained effect of this program could be enhanced with increased funding and protected time, as in other career development programs. Given the 1-year funding cycle, most scholars sought additional funding after the fellowship ended or continued to implement their projects without protected funding. Sustainable longitudinal funding and protected time for scholars would increase opportunities to build further on the influence of this program and catalyze cross-cutting national collaborations among scholars and mentors alike. Due to the pandemic, all but 1 of the sessions were conducted virtually, which promoted accessibility for a geographically disparate cohort but may also have limited engagement and collaboration.
Conclusions

Deliberate reflection on the work of the inaugural NAM DxEx Scholars cohort highlights important themes that can be applied to improving diagnosis. The development of a national leadership incubator focusing on diagnostic excellence aims to create effects beyond simply the scholarly outputs of each individual project or scholar. Rather, in focusing on a broad interdisciplinary team of scholars, each working with the overarching goal of improving diagnosis, the goal is to create a future generation of leaders in this domain who will stimulate and expand cross-cutting research, implementation, and policy change in the field of diagnostic excellence. Through the 5 themes articulated previously, diagnostic excellence can be promoted more effectively for all.

ARTICLE INFORMATION
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REFERENCES

